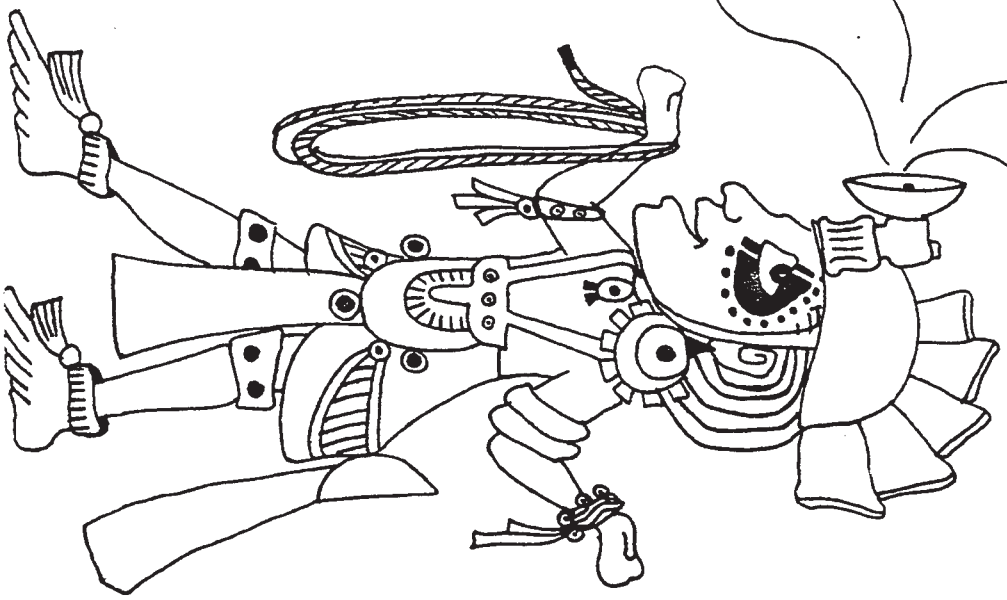
AMCS activities letter #1.



ASSOCIATION FOR MEXICAN CAVE STUDIES
MEMBERSHIP COMMITTEE
BOX 7672 UT STATION
AUSTIN TEXAS 78712

Christmas--New Year's Report Letter No. 1, Jan. 1975

The AMCS Membership Activities Letter is published by the Membership Committee of the AMCS, P.O. Box 7672, UT Station, Austin, Texas 78722. This informal letter is published to inform AMCS members of recent exploration in Mexico and is not intended to replace the AMCS Newsletter. The Activities letter will be published as often as necessary to bring recent developments to those interested in a brief informal report on new accomplishments in Mexican Caves. Send correspondence regarding the AMCS Bulletins and Newsletter to AMCS Newsletter, P.O. Box 7037, Austin, Texas 78712. Requests for information from the AMCS file should be sent to Box 7672.

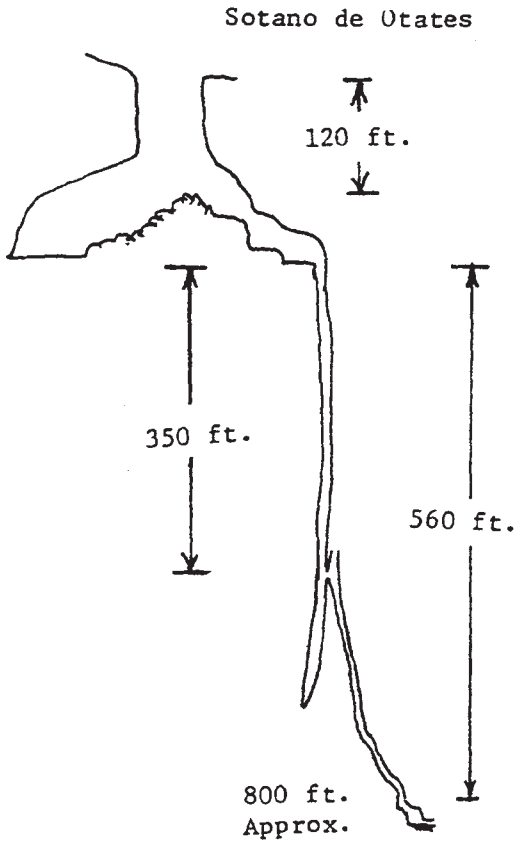
EL SALVADOR, TAMP.: Thanksgiving Day, 1974

A large group of cavers from the UT Grotto visited Sotano de Venadito on a trip led by Craig Bittinger. The trip was mostly a training trip but Charlotte Rogers, Jim Moore, Steve Rudy, Mary Connor discovered several thousand feet of large passage by pushing a pseudo-siphon at the end of the known cave on the 650' level. The passage has a strong air flow and was explored to a short drop.

NACIMIENTO DEL RIO TANTOAN, TAMP.: DEC. 27, 1974 Pat Asnes, Molly Asnes, Dennis Breining, Craig Bittinger, Clark Lillie, Neal Morris, Mike Van Note, and Barbara Vinson.

This group camped at the base of the Sierra de El Abra where the Rio Tantoan emerges from a large spring (Nacimiento). Several caves had been located on the mountain above the Nacimiento from air photos. The group followed an old mining trail up the mountain but could see no caves in the thick jungle. The local people reported that the easiest way to reach the crest was to follow a new road being built to the Otates Mine. This new road leads east from El Salvador (K 49.2) on highway 85 north of Cd. Valles, and crosses eleven miles of jungle-covered karst to reach the crest of the El Abra at the state line. The cavers were amazed at the road. The road crew was very friendly and took the cavers to two caves near the mine. Cueva de Los Indios was mapped and found to have over one thousand feet of large impressive passage broken by a sixty foot drop. Sötano de Otates was partly surveyed. It has a 120 foot entrance drop to a breakdown pile. From here a large decorated passage leads east over two climbdowns to the final drop, a 560 foot blind shaft six to eight feet in diameter. The group then returned to Cd. Valles and left a map of the new area at the Condesa Restaurant. A new caving area was opened up in the El Abra.

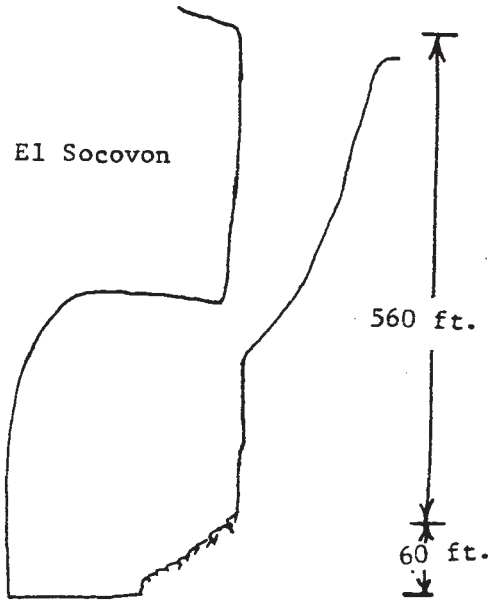
Neal Morris Bill Russell



TANCOYOL, QRO.: DEC. 23, 1974, Steve Zeman-Tx., Steve Ward-Pa., Pete Tolcser-N.Y., John Szczesriak-N.Y., Peter Strickland-Tx., Bill Stone-Pa., Art Stone-Ill., Carmen Soileau-Ill., Geoff Parkhurst-N.Y., Larry O'Loane-N.Y., Dave Mack-N.J., Bob Mack-N.Y., Diana Lowrey-Tx., Pete Kicza-Mass., Dave Hutchings-Tx., David Gutter-N.J., Mike Gfroerer-Ohio, Preston Forsythe-Ken., Pat Dillon-Pa., Nelson Corby-N.Y., Alexia Cochrane-Ill., Maureen Cavanaugh-Tx., Don Broussard-Tx.

The walk to the Socavon area leaves from the town of Tancoyol, Queretaro, located twenty-two kilometers north of the Xilitla-Jalpan highway. For 25 pesos per burro, per burro driver, per day, we rented three burros, a mule, and a local farmer to transport 1300 meters of rope and food for twenty-three people to the village called Rancho Carrizal, two days north-east of Tancoyol. On the third day the motly crew set up camp in an area called Ojo de Agua, three minutes walk from the closed valley which contained El Sotano de Socavon. The next day almost everyone entered the pit at intervals to survey, photograph, and make a biological collection in the large room at the bottom of the entrance drop.

The entrance to Socavon is in the end of a quarter-kilometer-long dolina. The top of the entrance is fifty by one hundred meters, with the high side being slightly undercut for a free rappel down eighty meters until you reach the neck of a funnel. Here it is only ten meters in diameter. The low side slopes to the neck and is covered in ferns, lichens, shrubs, and large-leafed plants. After twenty meters through the neck, one finishes the rappel, bouncing off a flowstone covered wall in the side of an enormous room, for a 180 meter drop to the apex of a talus slope. This boulder pile slides away from the wall of the chamber for seventy more meters to the damp dirt floor, 200 meters below the entrance.



The chamber itself is two hundred meters long, one hundred meters wide, and seventy-five meters high. There are several huge formations near the wall opposite the entrance drop, and a couple of pancake-sized fried eggs in the northeast end. Water has stood as much as one meter deep over some parts of the flat silt floor, indicating that there is no rapid run-off once the rain trickles in. No side passages exist in this immense room unless they are hidden below the silt floor, in which case they would be full of silt anyway. A small population of parrots use the room as home.

In the next few days, seven other caves and sotanos were found and sketched or mapped. Most were only thirty to seventy meters deep in two or three short drops close together, ending in dirt plugs. However, a 200+ meter system with several drops was found close by; but it also stopped at about the same elevation as Sotano de Socavon, ending in a dirt plug.

continued

So the large-entranced sotano which AMCS cavers had been hearing about since 1967 and which Bill Stone and Steve Ward had partially entered in August of 1974 was finally mapped. It did not turn out to be the record-breaking deep system we were prepared for. But Victor Benalcazar and Mike Schulte walked in from Azuismon, via Rancho Parada where they had been checking trails and rumors of more caves. There are still caves in the Xilitla plateau to be found. Maybe the next one will go.

Don Broussard

LOS SABINOS, S.L.P.: DEC. 24, 1974, Steve Barbee, Steve Beckman, Ken Dewire, Steve Joffe, Mark Minton, Paulette Minton, and Richard Minton.

The above people had just arrived in Los Sabinos campground and awaited the coming of Harold Goldstein, Karen Jacobson, Joe Maskasky, Tom Ramsey. This group arrived in Los Sabinos with several objectives--among them to film a Golondrinas trip and map Cueva del Aire and Cueva del Brujo. They connected Aire and Brujo last year but exploration is not complete. Mapping these caves is difficult not only because the cave is used as a shrine by

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Despite their previous plans, when the group heard of the new road in the El Abra they decided to go there. First they checked Sotano de Locut, a one hundred foot pit by the road. Then they explored Sotano de Otates, checked north of the road and south along the face of the range. Several of the group pushed Cueva de Diamante to about the four hundred foot level; the cave still goes. Others filmed the trail chopping, did Sendero (the new 712' pit by the trail), took movies in Sotano de la Cuesta at the end of a three hundred foot rope, and then checked Sotano del Arbol since they had brought their rope. This pit had a 177' entrance drop to a room with a four second pit on one end. The group then returned to Los Sabinos, happy but tired, to see how much of their original schedule they could salvage.

Bill Russell

Overheard while trailbuilding in the El Abra: "only one more chopping day until Christmas."

SAN CRISTOBAL, CHIAPAS: DEC. 29, 1974, Brian Larson (Calgary, Alberta), John Donovan (Blackpool, Lancashire), Blake Harrison (Austin, Texas), Mike Boon (Calgary, Alberta)

The group took burros from Tenejapa about six miles to Sumidero Yochib. They went downstream in this large river cave for five hundred meters. Here exploration was stopped two years before by large breakdown blokks that channel the flow of the river (132 cubic feet/sec) into impassable rapids. The group managed to pass the breakdown by crossing the river and bolting across a deep gut between the blocks thirty meters further downstream. There exploration was stopped at a rapids where the river--a meter deep and ten meters wide--went swiftly down a slight grade. They decided the only way to attempt the rapids was with a rope and jumars. Returning to a point nearer the entrance, they explored a fifteen by fifteen meter side passage about six hundred meters to a depth of about 210 meters. They thought this passage would bypass the rapids and return to the river, but it ended in a mud choke.

From Tenajapa they went to Huixtan near San Cristobal to climb a waterfall about three hundred meters back in the resurgence of one of the headwaters of the Rio Huixtan. They climbed the ten meter waterfall and found 120 meters of passage which ended in a sump. A low passage below the waterfall was not checked. Next, joined by Mark Stock and Bob Ranney, they visited Chen-Ven-Sil-Mut, a 120 meter long, fifty meter wide, 126 meter deep pit with a river crossing the bottom. The pit had been checked before and the river found to sump both upstream and downstream. This trip discovered a way up to a pit partly blocked by driftwood that connected to an upstream canyon twenty meters high and ten meters wide. Just as a new cave was found near the resurgence, the rains began to fall, forcing a return to San Cristobal. Mark and Bob planned to return, and Mike Boon wants to return in April when the river in Yochib will hopefully have less water.

Mike Boon as told to Bill Russell

EDITORIAL: A problem has arisen in Mexico that can only be solved by cooperation. Several groups of cavers have walked up to Golondrinas traveling light. These groups carry no rope, but plan to wait at the pit until someone with rope arrives. Then when the pit is rigged they expect to use the rope carried up by others. Most cavers so far have not realized the implications of letting other cavers use their rope. With a rappel time of thirty minutes and an assent time of two hours, each caver adds two and one-half hours to the rope time. One group of cavers realized this too late, and as they had only one day at the pit, there wasn't time for all of the group who carried the rope to use their own rope.

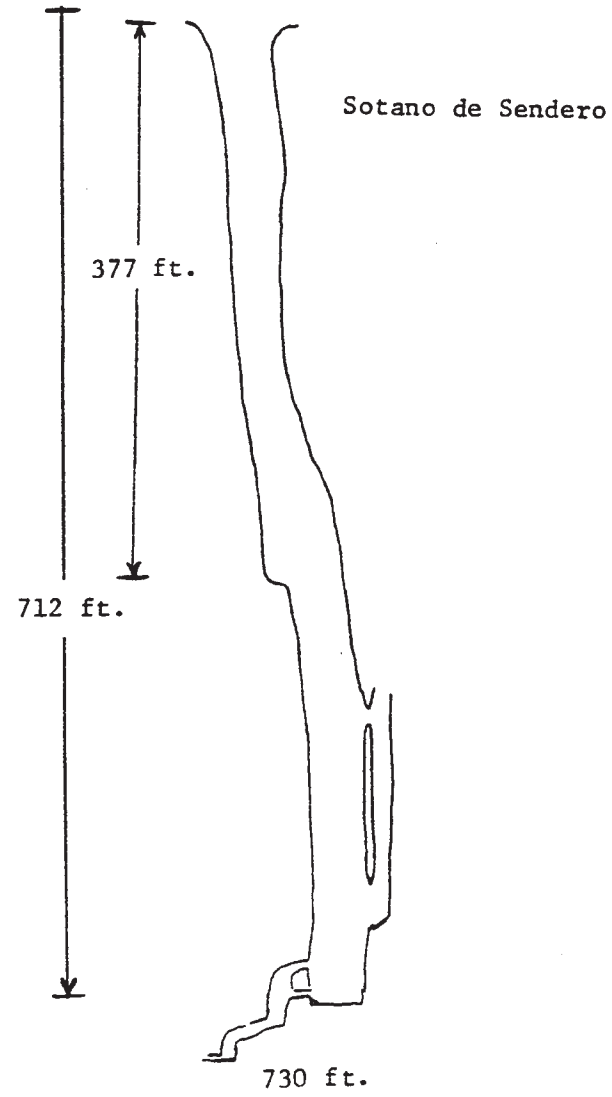
Several cavers that were waiting at the pit had rappelled in before they realized that it would take all the time left for everyone to climb out. We heard reports of a trip to Ellison's Cave where several cavers learned there was a rope in the cave and rushed to the pit. The cavers who rigged the pit had to wait in line for hours to use their own rope. We don't want this to be a problem in Mexico. There have been two solutions suggested. Most effective is to rig Golondrinas with a 600' rope and have all the interlopers go off the end. Less drastic is to have cooperation and have cavers plan their Mexico trips in advance. This solves many problems. Everyone has a ride, cars are full so gas costs are less, you know the people you ride with--an important factor in a crowded car on a long trip.

Bill Russell

MINA OTATES, TAMP.: DEC. 25, 1974, Andy Grubbs, Robert Hemperly, Logan McNatt, Bill Russell, Nancy Sayther, Terry Sayther, Barbara Wolf.

This group arrived in Cd. Valles after two days checking cave leads near Papagayos, east of Cd. Maiz. They found the map of the Otates Mine area in the Condesa, checked in at Los Sabinos, and drove to the mine. There it was decided to chop a trail south from the mine road on compass bearings from Neal Morris's map. To connect the mine area with the trail north from Cueva de Tanchipa required three and a half days of chopping. Assisted by Tom Ramsey and Joe Maskasky, the group cleared a trail through the karst for five kilometers south to Sotano de la Cuesta at the end of the Tanchipa trail. The new trail went by several pits, including a one hundred foot (unchecked), Sotano de Sendero (712 feet), Sotano de Arbol (177' to a room with a four second drop), and several smaller pits. The chopping went rapidly as we had a large group and the lead choppers cut only enough to get through and stay on bearing, while the people following enlarged the trail. Just north of the mine road a cave in the bottom of a large sink was explored and named Cueva de Diamante (Diamond) after the quartz crystals found in the sink. The first part of the cave is an old phreatic tube five feet in diameter that now takes drainage from the sink. Almost blocked by flowstone in places, the cave was climbable to about the 150' level. Then we returned to Los Sabinos and enlarged (with ten sticks of Kinopak) a passage that bypassed the Acupuncture Crawl in Cueva de Tinaja.

Bill Russell



NEWS NOTE: Aquismon, S.L.P.; Word is that a road is to be built to Tamapatz, a one and one-half hour (level) walk from Sotano de las Golondrinas. The road will start at Pimienta on the highway south of Aquismon, and follow the trail to Tampachal (one-half hour from Guaguas), then north to Tamapatz. Will a road to Tamapatz increase Golondrinas traffic? Will cavers still have to ask permission in Aquismon? What ever happens, things should be different. Construction is scheduled to start soon and should take about a year.

MINA OTATES, TAMP.: JAN. 4, 5, & 6, Pete Strickland, Bill Stone, Art Stone, Carmen Soileau, Alexia Cochrane, Brian Clarke, Maureen Cavanaugh, and Don Broussard.

From the due south trail connecting the mine and the Tanchipa trail, a two day due east chop toward a pit seen from the air by Bill Russell located the pit itself and another sotano about two hundred meters north. The pit, Hoya de Hojas Grandes, is twenty-five by fifty meters by fifty meters deep. No rope is required; it was just a very steep chop to the bottom, which is covered in huge banana-tree-shaped leaves. A short passage near the upper edge connects with the surface forty meters away.

The other pit, Sotano de Arbol Sangre, is a fissure five meters wide and thirty meters long. The entrance drop is about thirty meters, and after two other drops, a total depth of roughly 150 meters is reached.

Glenn Darilek, Ed Geldstone, Steve Gutting, Bill King, Greg Passmore, and Chuck Stuehm visited Cueva de Nacimiento del Rio Frio, Grutas de Quintero (you can drive through the cave with four wheel drive), Cueva de El Abra, Cueva de Salitre, Puente de Dios (by Jalpan), and Cueva de Taninul #4.

NEWS NOTE: Neal Morris is editing a book on the speleological exploration of the Sierra de El Abra that should be available soon. Plans are to publish the book under the auspices of Gill Ediger*s International Speleological Foundation, so that the foundation can show prospective doners the kind of work it will sponsor. As soon as this book is available we will notify all AMCS members.

In Hoya de Guaguas, a skull was found which was keyed out by Mike McEachern to be Eira barbara senex. This diurnal mammal inhabits tropical forests and climbs, runs, and swims well. It feeds on many species of small mammals and birds, as well as on fruit. Body length is roughly a half meter, excluding the tail. It is commonly known as a tayra.

Taken from Mammals of North America by Hall and Kelson.

A canal was continued in the second level in Cueva de Los Sabinos. In an attempt to lower the water level in the siphon lake just north of Sotano de Arroyo, water was channeled to a lower level of the cave. A third canal needs to be dug about half a meter deep and twenty meters long to lower the water in the siphon lake 0.6 meters. Eleven cavers worked two hours in the second canal which was thirty meters long and 0.4 meters deep.

Don Broussard

LA CAPILLA, S.L.P.: DEC. 15, 1974, Steve Hudson, Ann Knox, Buddy Lane, Marion Smith, Bill Steel, Doug Strait, Ed Yarbrough, et. al.

This group went up the chapel trail to visit and photograph in Sotano de la Cuesta and Sotano de la Estrella. On the way they checked Coatituesday and found it to be about 147 meters deep--somewhat narrow towards the bottom. Some of the group also visited and photographed in Hoya de Guaguas.

We heard a group on the way to Golondrinas rolled their Blazer south of Cd. Valles. No one was injured and they did the pit anyway.

During a three month stay in Merida this group mapped and made biological collections in the Yucatan Peninsula. On the way down they mapped the commercial cave Grutas de Cocana near Teapa, Tabasco. Much time was spent mapping in the incredible maze, Cueva de Kaua, east of Chichen-Itza. About six hundred meters were mapped per trip; the cave is now over six thousand meters and still much more to survey. The group finished the map of Xtacumbilxunam (the Cave of the Nine Wells), a famous cave near Bolonchen in Northern Campeche. The cave is developed on several levels, totals over sixteen hundred meters in length, and reaches a depth of 102 meters. They also finished the map of Las Grutas de Tzab-nah south of Campeche, about nine hundred meters long, and Actun Chen-Mul in the ruins of Mayapan. Four caves were located in the Sierra de Ticul. The largest, Gruta de Chukum, was important biologically. Two new caves near the ruins of Xul were explored, one intersected by an eighty meter hand-dug well. The most notable new discovery was Grutas de San Antonio in remote northern Campeche. This cave has eleven hundred meters of large passage and reaches a depth of 113 meters. A hand-dug well intersects a fifteen meter high passage in the lower level of the cave and continues until it reaches water at the 113 meter level. A blind tarantula was collected in this cave.

Several caves near Santa Elena were visited. Pozo Nohcacab in the center of town was being dug out by local labor. Pozo Okbinchen was a series of drops to a large room. Actun Xcoch, in the same area, was first reported in John L. Stevens book Incidents of Travel in the Yucatan, published about 1840. The cave had been sealed for forty years, but was dug open and explored for over three hundred meters. Another Stevens' cave, Gruta de Chac, about six hundred meters long and sixty-four meters deep, was mapped. Important biological collections were made in the Sierra de Ticul near Otzkuab in Actung Tzitz, a large inclined room. Also visited were Actun Sabach, a large multiple skylight cave near Tekax, and Cueva de Monte Bravo in southern Campeche, over five hundred meters long. Many other caves were visited and the group felt that if they had stayed three more months, as much more could have been accomplished.

David McKenzie as told to B. Russell

Warren Netherton, Roger Skaggs, Devi Ukrain, and Dave Whitacre arrived on foot in Los Sabinos after their car crossed Texas, but not the border, with no license plates. They were visiting caves in the Los Sabinos area.

Diana Emerson and Walt Jaskinerny of the Windy City Grotto arrived in Los Sabinos after five days of having their car worked on in Dallas, Texas. Grim...

Bill Edison, Nancy Edison, Ron Gariepy, Karen Hoskin, and Dave Kelley couldn't find Soyate, did Golondrinas, and planned to do Guaguas.

The Left-Hand Water Passage in Cueva de Tinaja ends in a room five meters by six meters long, with less than 0.3 of air above water of unknown depth. This is one of the few places in the Left-Hand Water Passage where a caver's body can be vertical. But you may be within only fifteen meters of another lake in Sotano del Arroyo. Explored by Mark Stock and Don Broussard.

amcs
ACTIVITIES
LETTER

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ASSOCIATION FOR MEXICAN CAVE STUDIES
MEMBERSHIP COMMITTEE
BOX 7672 UT STATION
AUSTIN TEXAS 78712

AMCS MEMBERSHIP ACTIVITIES LETTER

Edited by Bill Russell

Spring Report Letter No. 2, May 1975

The AMCS Activities Letter is published by the AMCS Membership Committee as often as necessary to keep the AMCS members informed of speleological activity in Mexico. This is a newspaper of the Mexican underground and we welcome brief accounts of current trips. Longer accounts will be edited to our brief format. The activities letter does not replace the AMCS Newsletter and Bulletin as a permanent repository for information. At this time it seems likely that the AMCS Bulletin and Newsletter will be combined into a publication tentatively called the Journal of Tropical American Speleology. This change is not planned until the completion of the present volume of the AMCS Newsletter. The new format will broaden the scope of the publication and make it a professional journal for all of Tropical America.

The second issue of the AMCS Activities Letter covers the period from the end of January to the beginning of May, a relatively quiet time between the New Year trips and the summer expeditions. Though not a time of peak activity, trips were made to the Valles Area in San Luis Potosi and the Chiapas Highlands. This issue also presents timely information on the various systems of cave map symbols, since the NSS is soon to consider the adoption of a standard system of cave map symbols. To avoid confusion, it would be beneficial for all cavers to use a common set of symbols. But the list submitted to the NSS by James Hedges is not acceptable to most active Mexican cavers and is not compatible with past mapping. The NSS should adopt the AMCS list, calling it for convenience the NSS standard list. This is a list that would be used by all cavers.

The cover drawing on this issue of the AMCS Activities Letter, as well as the cover drawing on the first issue, is by Dino Lowery. The cover bird is Pedro, the mascot of the Kirkwood Caver House. His kin are a familiar sight in the Mexican forest, where the calls of the colorful flocks wake the tired caver to an early dawn.

Bill Stone writes from the cold northlands of New York that he plans a trip to the El Socovon area this summer. He plans to reconnoiter the area from the air --- starting with the El Abra and flying west to concentrate on the area west of Golondrinas where he thinks there is "something huge." He also speculates that he might go to Yosemite and rappel off El Capitan (3200 feet), "in order to dispel any myth about present systems not working for drops of over 2,000 feet." If he can find enough rope and sherpas. We wish him luck. He is soon to move to the Tuscon area and wants to know if anyone is checking out the Sierra Madre Occidental.

The latest issue of the ROC Cairn, the newsletter of the Rensselaer Outing Club, contains a 15 page account of the Christmas trip to El Socovon by Bill Stone complete with area maps and sketch maps of El Socovon and Sotano de Ojo de Agua (283 foot entrance drop, total depth 746 feet). Several other pits were located and explored in the El Socovon area, and numerous leads were gathered for the next trip. After returning to the road at Tancoyol, the group split up, some of the group following the new road to the top of the El Abra and chopping out to pits. The thrill of discovery is evident in Bill's account of the exploration of Sotano de Arbol Sangre: "We arrived at Sotano de Arbol Sangre around noon and rigged to a sinuously rooted tree which literally "bled" white sap when cut, hence the name Arbol Sangre. Bryan rappeled in the 100' entrance drop to a breakdown mountain sloping steeply down. He walked down out of hearing range and returned 10 minutes later reporting he had found a 20' diameter pit of unknown depth. Art and I descended and Don went over to the other nearby pit to begin chopping down.

We climbed down the breakdown and took a look at Bryan's pit. It looked deep. We examined the rest of the passage which had a deep fissure running down the middle. It ended 200' further on in a 3 second pit. We returned to Bryan's pit again. This time we dislodged an immense boulder, perhaps a meter cubical, and rolled it in. 1...2...3...4.CRASH..5...6...7...8..CRASH..RUMBLE..12..13..14..CRASH..18..19..20..BOOOOOM! At this point (no kidding) the floor we were standing on shook! GEEZUUZ! Well, our first thought was to forget it and come back tomorrow with a BIG rope. However, as in the case of many other deep pits, rock times can be deceptive, especially if the walls are close together and permit a lot of bouncing. So we decided to at least give it a try with the ropes we had. We climbed out and hiked over to where Don was chopping and had lunch. From the "lunch ledge" Don's pit looked like it might be deep so I stayed to help chop while Bryan and Art went to try the pit with a 300' rope. Don and I managed to get to the bottom in about 1/2 hour. It was only 200-250' deep, shear on 3 sides. No passages except for a small tube leading to a skylight entrance. Don decided to return to camp. Bryan and Art were still in Sotano de Arbol Sangre so I dropped in and climbed down to the second pit again. Bryan was in the process of Jumaring out on the 300' rope. We arrived semi-exhausted and reported that the 300 feet wasn't nearly enough. We decided to try one more time and tie on the remaining 120' rope. Since neither Bryan nor Art wanted to rappel over the knot that left the dubious honor to me. We rerigged using a minimal amount of rope tied around a semi-solid looking column...shaky! The pit is smooth walled and roughly elliptical with a narrow fissure running off each end. At -300' I tied on the 120' rope and kept on rappelling. At the end of the second rope I was about 10' off the top of a talus pile. Totally forgetting in my excitement that I was at the end of 420' of GOLDLINE, I untied the knot and rappelled off the end. TWANG. ZIP. Up went the rope 25' off the floor! Well, what a bummer! After getting over a surge of blind panic I found that I could chimney (just barely) up enough to clip a Jumar on the end and pull it back down. After tying it off I followed the high canyon-like passage for 200' where it ended in silt fill. We surveyed out and started back to camp by dusk. Total depth was 709' with the second drop officially 433'."

Michael Schulte has been working on his Aquismon Area Project during January and February. On December 28 he met the El Socovon trip at El Socovon, then was back in the Aquismon area to yo-yo Golondrinas with the NY Rensselaer Outing Club Group. Then he searched unsuccessfully for the Bridge Pit, and met Roger Skages, Rich Stocker, Warren Netherton, Devi Ukrin, and Dave Witacre to do Hoya de Guaguas. On January 21 he helped carry Blanca Rubio Ramirez, a Tamapatz school teacher, over a muddy trail in a makeshift stretcher from Tamapatz to Aquismon and then drove her to a hospital in Valles. After checking caves north of Tansosob he returned to Tamapatz and finally found the elusive Bridge Pit, Joya Jawecito, on February 15. It is an impressive pit but not the deep shaft we had hoped. It can be climbed without rope. He concluded "there are still significant leads and much mapping left in this beautiful area."

Discovery of Diamond Cave

Diamond Cave promises to be a major cave, a deep complex three dimensional maze beneath the dolina just to the northwest of the Otate Mine. Just west of the mine the new road circles the south edge of the dolina, so when our group arrived at the Otate campground an obvious first thing to do was to check this nearby dolina. So soon after we set up camp I walked back down the road and crashed down through the jungle. On reaching the flat densely overgrown floor of the dolina, it was apparent there were no large overhangs, but there was a small drainage channel crossing the bottom. I followed this shallow channel to where it sank under a low ledge in the southeast corner of the dolina. After clearing some debri it looked possible to squeeze into the opening and follow the water - and there seemed to be a small air flow, rare in the El Abra. The entrance looked small but promising, but air flow in the El Abra indicates a connection to big cave. Encouraged by this thought I decided to chop a trail directly south back to the car as it would be much shorter than the roundabout way I had come. After chopping 20 feet south I stepped across a small hole in the karst that looked like it should be checked. Trail chopping became increasingly difficult and after a hundred feet a series of jungle covered six foot ledges convinced me that was not the best way to return to the car, so I circled back the way I had come.

That afternoon Andy Grubbs and I returned to check out the small sink, and after much squeezing managed to explore about 100 feet of small tube to where the tube divided into several smaller tubes too small to follow. We squeezed back out and while Andy looked for quartz crystals in the arroyo, I went back to check the hole in the karst. This hole is only about 2 x 2 feet and is like thousands of cracks in the karst but seemed deeper. But once I slid into the opening it was obviously not just another hole in the karst. A six foot in diameter tube sloped downward and was scoured clean by water entering from the dolina bottom through cracks in the karst. I quickly explored for about 100 feet to a climbable ten foot drop where I returned for Andy. We returned to the drop, Andy climbed down and indicated the cave continued, but due to light trouble we had to wait until that evening to explore further. That evening we pushed through the squeezes to the Frog Falls area and Andy climbed to the bottom of the flowstone only to be stopped by an unclimbable pit. We flagged the entrance, but as time was short and we wanted to finish chopping the trail south to Cuesta we left further exploration to others.

Bill Russell

Cueva de Diamante - Tamaulipas, Mexico

Cueva de Diamante (Diamond Cave, so named for the quartz crystals found around the entrance) was discovered at the base of a large sink just north of the new Mina Otate road in late December, 1974. The scouting party which discovered the cave explored only a short distance in the steeply dropping phreatic tube, being stopped by a short pit. At that time a group from Ohio, Colorado, and California began further exploration and mapping.

The upper section of the cave would be mostly walking/stooping passage were it not often nearly plugged by flowstone, requiring one to crawl over and under various deposits, dams, and bridges. 76 feet from the entrance is a small room containing two flowstone dams, behind which are 16 and 19 foot climbable drops. 83 feet beyond these drops the floor of the passage becomes completely blocked by a shallow pool 24 feet long, necessitating an awkward chimney in the 2-3 foot high tube to stay dry. Crawling over flowstone and pools an additional 59 feet brings one to the top of a series of steep, slippery, ten foot deep flowstone cascades, on the upper end of which were seen around two dozen green tree frogs. The cascades are difficultly climbable; a hand line being of considerable advantage for the last one. Another 28 feet brings one to the first pit, 296 feet from, and 131 feet below the entrance. Several small tubes were seen leading off near the ceiling of the small room at the top of the pit. Only one of these was checked, and led to the top of a dome associated with the pit complex (voice and light connection).

The pit drops 30 feet to a ledge, below which it is divided by a thin partition. To the left of the partition an additional 35 foot drop (climbable) reaches the floor of the pit, which contains a narrow crevice 8 feet deep leading to some wet crawls. A passage leading back under the upper passage drops steeply for 26 feet, bringing one to the top of a series of large, offset drops approximated at 125 feet deep. The top of these drops is 216 feet below the entrance, and is the end of current mapping.

This second pit is entirely different from the upper section of the cave. The walls, which contain numerous unchecked holes, are covered with large calcite crystals. Even the flowstone in the pit seems to have been crystallized. Most of the pit is probably climbable, although a rope is preferred. From the bottom of this pit, a passage to one side leads after about 25 feet to another drop estimated at 30-40 feet. This pit, which was not descended for lack of rope, also had large calcite crystals up to 6 inches long completely covering its walls and ceiling. The walls also contained many unchecked leads. Several Herkimer Diamonds, up to an inch long, were found near this drop.

A small crevice leading the opposite direction drops steeply and leads after about 50 feet to still another pit, estimated at 50 feet, also not descended. Immediately below the lip of this pit a large passage could be seen coming in, but could not be reached without a rope. Several white isopods, up to an inch in length, were seen in this area, which was quite damp. Air movement was considerable.

continued

To the right of the partition in the first pit, a climbable drop of 25-30 feet leads to an unmapped canyon passage. About 20 feet down the canyon is a climbable 10-15 foot drop containing a very tight, jagged canyon which leads to two more short climbable drops. The second of these leads one to the top of a short drop, "size 28 pit," so named because a person with a 28 inch waist could squeeze through a slot in the floor and climb down the pit without rope. About 30 minutes of hammering enlarged the slot to accommodate someone of about size 32. The bottom of this 20-25 foot pit contains another miserably tight canyon, which required changing levels frequently in order to get through. This canyon abruptly ends and is intersected by a similar canyon to the right. After crossing a 10 foot deep hole, the canyon widens out giving one about 50 feet of walking passage 3-4 feet wide. Several more quartz crystals were seen in the gravel at this point. The canyon soon narrows again and after some Z turns becomes extremely tight at ceiling level. At this point one can climb down 20-25 feet to the floor of the canyon, which abruptly drops down a slightly wider black hole. Rocks dropped free for 2 seconds, and bounced an additional 1-2 seconds. There was considerable air movement up out of this hole, which has some very unstable breakdown wedged in at the top. Exploration was stopped at this point, again for lack of rope. A bolt kit may be necessary for rigging this pit.

A total of 370 feet was mapped in Cueva de Diamante, and at least that much more explored. Exploration was stopped by pits at every turn, each one moving air. The potential for this cave seems tremendous - future explorers should be good climbers and bring plenty of rope. !Viva la El Abra!

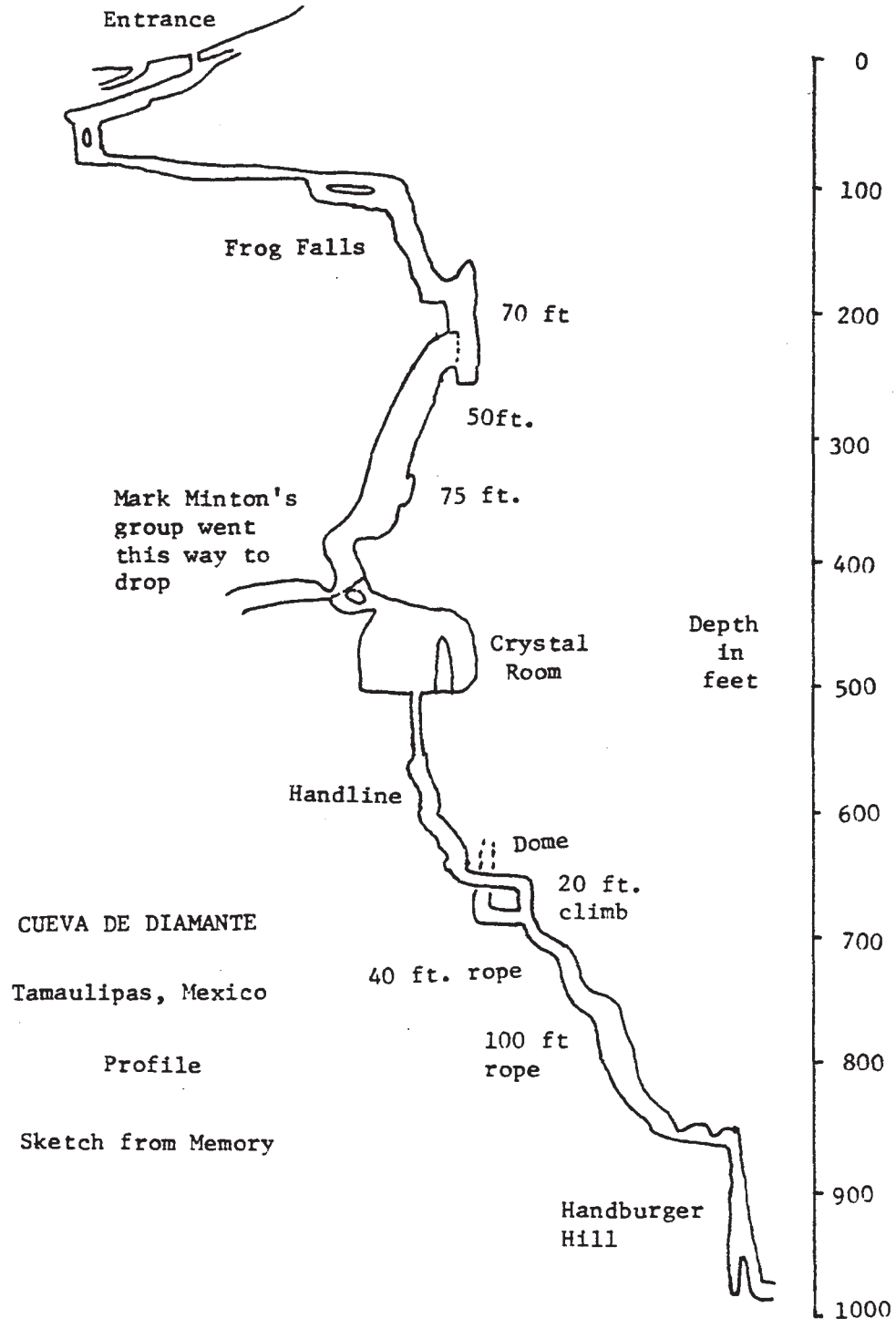
Mark Minton

El Salvador Tamp March 23, 1975

Don Broussard, Jim Moore, and Charlotte Rodgers arrived at Sotano de Venidito and rigged drops down to the 600 foot level. Here they explored past the downstream "syphon," now open by 3 feet as opposed to 6 inches on the last trip. With the increased opening the airflow is not noticeable. They took Steve Ryan's water passage, the one that Steve Ryan, lagging behind, followed on the last trip thinking it was the way out. This is a large, apparently downstream, passage with deep (over 6 feet) water, 3-15 feet of air space and 25-30 feet wide. After about 1000 feet, the passage pinched into a 3 foot wide 30 foot high crack. This narrow section of passage slowly dropped through pools of water for about 300 feet, then enlarged to 40 feet wide, 30 feet high with waist deep water. After 1500 feet the passage was 20 feet wide, with 10 feet of air space, and occasional bats. Here time forced a return to the surface. The next day they completed the map to the 600 foot level and derigged.

The AMCS now maintains a limited supply of topographic maps of the Valles area (between Cd. Valles and Cd. Victoria). These are intended primarily to supply those on their way to Mexico, but mail orders can be filled.

The AMCS welcomes comments and suggestions about this activities letter.



CUEVA DE DIAMANTE

Tamaulipas, Mexico

Profile

Sketch from Memory

Diamond Cave Revisited

Andy Grubbs, Steve Deathrige, Paul Fambro, Jim Feely, and Mike McKee arrived at Mina Otate on March 23. Also in the group were Terry Sayther, John Omnaas, Craig Smith, Mike McEachern, Nancy Boice, and Dennis Breining who planned to work on the trail to Cuesta, while the others made a reconnaissance trip into Diamante. They were equipped with many short ropes for the small drops, as on the Christmas trip the only ropes available were long ropes for the big pits that no one wanted to drag through the cave. Next morning the reconnaissance group climbed through the first part of the cave and started rigging at a series of flowstone cascades, named Frog Falls after the numerous frogs. At the bottom of Frog Falls, minus 131 feet by the Minton survey, a series of drops leads to an offset into the Crystal Room, 75 by 50 by 75 feet high - the walls covered by 6 by 6 inch calcite crystals, attractive though dry and dusty. This room also contains what looks like a crystal-covered Titan Missile, either a now mostly dissolved wall or an old stalagmite. Just before the Crystal Room a small hole leads to the passage followed by most of the water entering the cave, diverted away from the Crystal Room by a partition. This is the passage followed by Minton's group on the Christmas trip. On this trip it was decided to check a narrow crack leading down from one side of the Crystal Room. This fissure was chimneyed for 50 feet to a sloping passage that was followed to a handline drop, where Andy climbed down to the top of another drop. On the way back to the Crystal Room, Mike McKee fell 15 feet when a handhold broke, but suffered no serious injury.

The next day the group, now consisting of Andy, Steve, Dennis, and Craig returned and rigged several more drops to a squeeze leading through the Pebble Room to the top of a 130 foot fissure divided by a thin partition halfway down. This section was named Handburger Hill due to the sharp nature of the rocks. Andy climbed to the bottom of the fissure, but ended up on the wrong side of the partition. He could see the crack continuing, but from where he was, the continuation was not easily reached, and time was running short, so he climbed back out. The total depth of Diamante is estimated to be almost 1000 feet, still continuing, and several hundred feet short of the potential of the cave, located on the crest of the Sierra de El Abra.

Just before they left the Otate Mine area they checked a pit the miners had told them about between the Diamante Cave entrance and the Camp, about ten minutes from the car. They reached the pit and dropped a rock. Three seconds free fall and then it bounced out of hearing. But alas they had to meet a group in Taxco to tour the underground course of the Rio Chontalcoatlan, the warmest of the two Dos Bocas that emerge below Cacahuamilpa.

Notes from Tom Ramsey:

1. Second drop in Otate is not blind; there is a methane sump lead down there. We never did get anyone in our party on the bottom.
2. You said that when we came back from Mina Otate that we were happy but <u>tired</u>. I take offense at that cliche word: tired. We Crumpers and Hlocut cultists never tire!
3. George Tracy's group spent Xmas in the Chiapas. They never did manage to catch up with Mike Boon, but they did get some caving in.

San Cristobal Chiapas, March 28, 1975

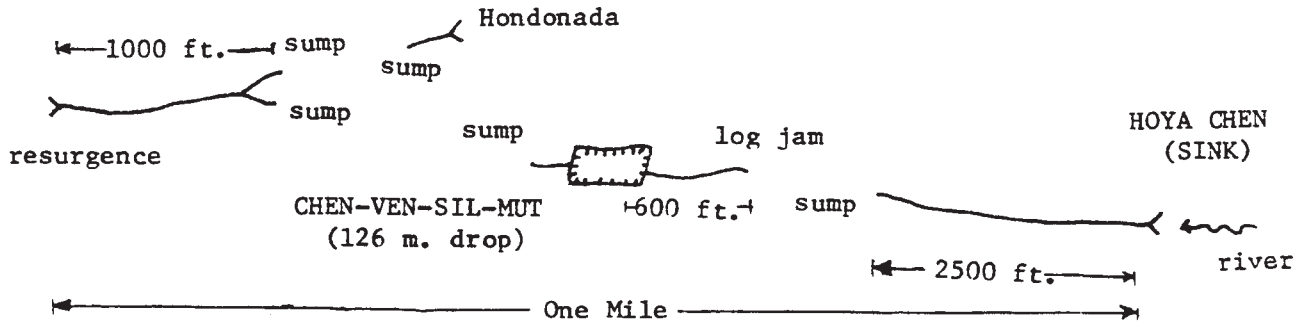
A continuing report on the exploration of Sumadero Yochib, a large river cave near Tenejapa. Since the Christmas trip Barb Larson, Mark Stock, and Bob Ranney had been back to Yochib and explored another 300 feet downstream to a 5 foot pitch that needed a bolt to pass. So in March these three, plus Mike Boon returned and descended the 5 foot pitch and the next two pitches of 6 feet and 8 feet. These lead to a 90 foot pit broken by a bridge halfway down. Here the stream makes a right angle, turns along a cross joint (see sketch). This drop temporarily halted exploration but a return trip descended this drop and progressed to where a 40 foot pitch bypassed another waterfall. A short swim lead to a 20 foot pitch beside the next waterfall where more swimming lead to a large chamber. Beyond this chamber the stream runs through boulders to a 20 foot chute. The chute can be bypassed by traversing to the right, dropping to a ledge, and then down to a relatively level area, named The Bad Dreams Section. Here the stream has to be crossed using the ladder as a belay while climbing across a sill above the rapids. Another short traverse leads to a 50 foot drop into a pool. At this point Pete Thompson flew in from Canada to join the group. The reinforced group then did the drop into the pool, crossed over the head of another waterfall, bypassed the tenth waterfall using a dry slab to reach a cable ladder drop into the race above the 11th waterfall. Here there was a distinct change in the character of the cave, and the stream funneled into a narrow gut leading to a waterfall that could not be bypassed with a single bolt. Instead a tricky climb is needed to avoid the force of the water. On this climb Pete Thompson managed to fall 15 feet into a shallow gravel floored pool, spraining his ankle.

Beyond the pool, the river flows over the 13th waterfall and into a narrow channel requiring a multi-bolt traverse. Somewhat discouraged, the group returned to camp set up in the Big Chamber where Thompson laid up for two days while Larson and Boon surveyed and detackled. The group felt that a big push was not in order as prior to the fall on the 12th waterfall, Mark Stock had dropped 20 feet on the 2nd waterfall pitch and bruised his knee. This fall was not serious as it occurred in sight of daylight, but the two injuries and the powerful current of cold water that could not always be avoided created a demotivating mental climate. It was decided to push the cave on a return trip with fresh bodies. It is fortunate that Yochib is being explored mostly by Canadians as ordinary cavers are not familiar with the cold and wet.

Mike Boon as told to Bill Russell

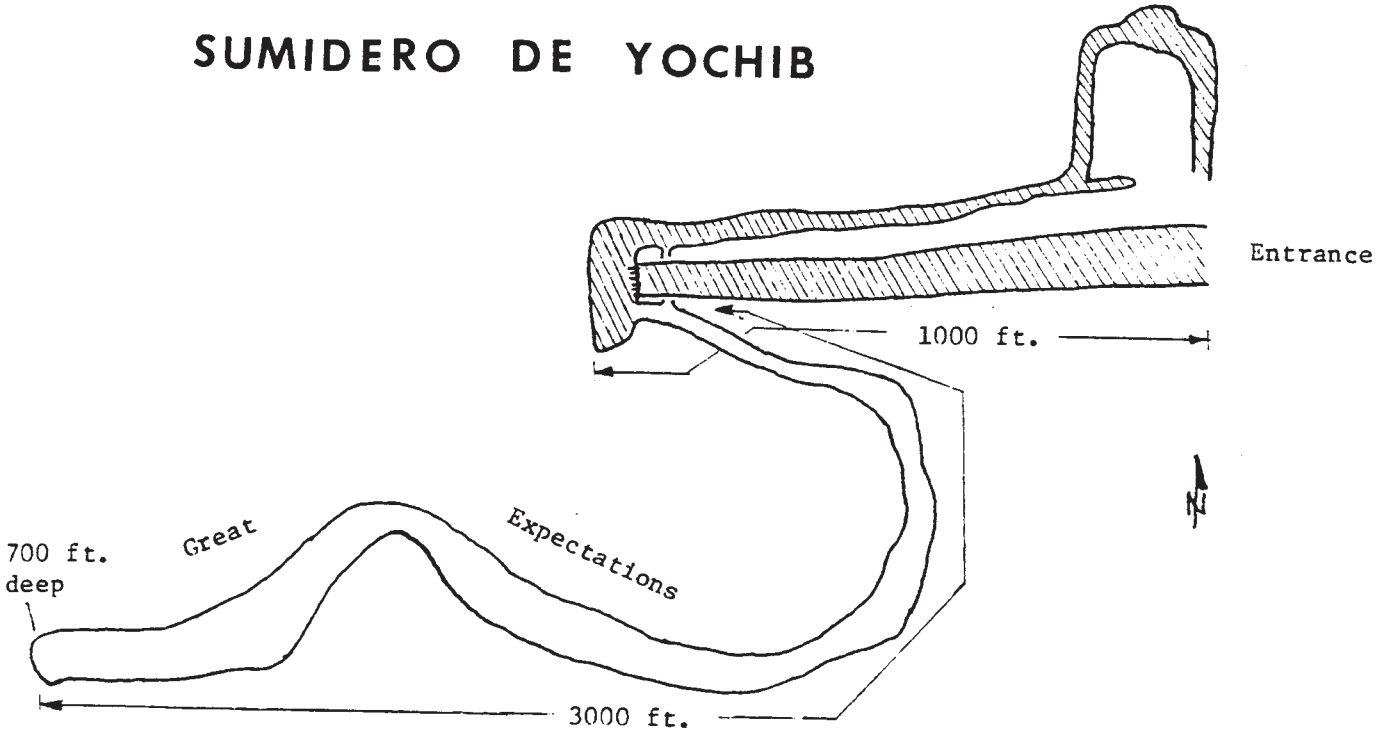
The February Cleve-O-Grotto News contains details of a trip to Chiapas by George Tracy, Angie Hodonsky, Mike Shawcross, and eight others, mostly Canadians, but reported on by Sasha Hafez, a Cleveland Grotto caver attending university in Canada. The group visited El Chorreadero in a park near Tuxtla Gutierrez, passed a group of cavers from McMaster University, and then visited the well-decorated, easily traversed Cueva de Rancho Nuevo in the pine forest near San Cristobal. They next went cave hunting near Tenejapa where they located a new cave, Sumidero Chicja, and mapped for about 1000 feet. They returned to Cueva de Rancho Nuevo for a New Year's party where they met a group of French Canadian cavers in identical caving uniforms. From here they drove south to Guatemala and back to Canada.

CHEN-VEN-SIL-MUT SYSTEM



More on Chen-Ven-Sil-Mut

Ranney and Stock explored the passage found by Larson and Donovan upstream in the river that flows across the bottom of one of Mexico's largest pits, Chen-Ven-Sil-Mut. This passage lead upstream for about 600 feet to a logjam. A party from the Alberta Speleological Society explored the sink end of the same system from the Hoya Chen entrance for about 2500 feet to a log-filled sump. One kilometer upstream from Joya Chen a -4600 foot cave was explored after diving through a sump later drained by digging.



1000 Foot Pit in Chihuahua

This report of a 1000 foot plus pit in Chihuahua was brought to the attention of Donald Davis by Jon Haman. Davis sent it to Frank Binney where it was found by Barbara Vinson who passed it on to the AMCS. It is part of an article in the American Institute of Mining and Metallurgical Engineers (Technical Publication # 154. Walker, R.T. "Deposition of Ore in Pre-Existing Limestone Caves," issued with Mining and Metallurgy, November, 1928). The article is discussing an ore chimney in the Potosi mine at Santa Eulalia, Chihuahua. As an afterthought, they mention "A few hundred feet distant from this orebody the limestone strata are penetrated by a large open chimney cave, over 100 ft. in diameter, which is reported to extend from the volcanic capping near the 600 ft. level to the 1600 ft. level, and for an unknown distance below. It is doubtless the conduit of an extinct hot spring, formed after the mineralization of the district took place, since it contains no ore minerals, except in a few places where there are small earthy deposits of monheimite, the brick-red zinc-iron carbonate, which have obviously been derived by migration from the oxidized portion of the near-by Potosi ore chimney. It is a suggestive circumstance that this postmineral chimney cave is of such shape that if it were completely filled with ore by ascending mineralizing solutions, which would also replace the walls to some extent, the resulting orebody would be structurally indistinguishable from the Potosi chimney. Further evidence as to the probable cave origin of the Potosi chimney is afforded by the fact that in the neighboring San Toy mine an orebody in the shape of a horizontal pipe, but doubtless formed during the same period of mineralization, exhibits cave breccia of apparently premineral character."

Dr. Robert Mitchell of Texas Tech University has received a grant from the National Geographic Society to continue his and James Reddell's biological study of the cave life of the Yucatan peninsula. They plan to work in Yucatan this summer and can be reached %James Reddell, Lista de Correos, Merida, Yucatan. Any cavers who plan to visit the area should write in advance of their trip.

Just received a letter from Frank Binney, Inside Earth editor and noted speleoadventurer, that he is going to far distant lands to film the British attempt to find the world's deepest cave. With a little effort, AMCS members should be able to find a deeper cave in Mexico. It is perhaps all right that so far the French have explored the deepest caves, as they live there, but the British? This summer all AMCS members can help restore the national honor, beat the British, and embarrass Frank Binney by finding a mile deep cave in Mexico.

Everyone should receive a membership card with this issue. Some were sent out with the first issue, but no records were kept, so everyone gets a card this time.

Cave Map Symbols

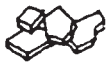
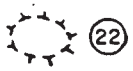
On the following pages are three sets of cave map symbols: the set by James Hedges now being distributed by the NSS office, followed by the AMCS set of symbols and the set of symbols used by Ernst Kastning, a caver active in New York, but with considerable experience elsewhere. Other commonly seen sets of symbols are those used by the Cave Research Group and the symbols used in Missouri Speleology. James Hedges has submitted a set of symbols to the NSS to be adopted as the NSS standard cave map symbols, but unfortunately this list is not available as it is so long he has not been able to prepare copies, but the main difference between the list given and Hedges' revised list are covered in the discussion.

Cave map symbols should enable the printed map to convey as much information as possible about the three dimensional cave in a limited space. The set of symbols should be complete, so that all common features have a unique symbol, and blank paper indicates only lack of data. The set should be versatile so a few symbols can be combined to indicate most of the features found in the cave, and they should be easily used by persons of little artistic ability.

The advantages of a standard set of symbols are so overwhelming that it would seem that a nationwide system would long ago have been established. There are several reasons why this has not been done. The first is that most mapping is primarily for local consumption. The local caver provides the vast majority of all persons actively interested in a cave map and they know the local set of symbols, so the map is useful to them. This localism is being weakened as cavers increasingly visit distant areas and feel more a part of national and international caving organizations. Inertia is another reason why a standard set of symbols has not been adopted. Once a region or a survey has used a set of symbols to draw numerous maps they do not want to learn a new set and make the old mapping obsolete. However, as most surveys and regions will admit that a common set of symbols will someday be adopted, the sooner the change is made the fewer maps will have been drafted using an eventually obsolete set of symbols. The need for a common set of symbols has not been obvious to many non-mapping cavers as most cave maps, especially those published in journals of wide circulation, are drawn to such a scale that only the general outlines of a cave can be given and no special symbols are necessary. However, the relative decline in the cost of printing in relation to the cost of living has made it possible to print more large cave maps that use special symbols extensively, and many of these maps are attaining wide circulation. As the student of speleology travels from Canada to Mexico and attends a conference in Yugoslavia he encounters a bewildering variety of special symbols and local notations. Standardization has been taking place slowly through communication and personal contact, but the adoption of a standard set of symbols by the NSS will set the trend for the entire North American continent and should be carefully considered.

Simbolos: 1.pared de la cueva. 2.dolina. 3.estalactitas etc. 4.gours. 5.derrumbes: 6.tierra. 7.diaclasa. 8.pendiente abrupta. 9.pendiente.

Cuban Cave Map Symbols

SYMBOL	MEANING
	CEILING HEIGHT IN FEET
	HEIGHT ABOVE AND BELOW WATER IN FEET
	LEDGE OR DROP IN FEET – HATCH SIDE DOWN
	SLOPE IN FLOOR
12	DEPTH OF FLOOR BELOW DATUM
25	ELEVATION OF FLOOR ABOVE DATUM
	PASSAGE WALLS – DASHED = UNSURVEYED
	CROSS-SECTION, SMALL LINE POINTS IN DIRECTION OF VIEW
	LARGE BLOCK BREAKDOWN
	SMALL SLAB BREAKDOWN
	PIT – DEPTH IN FEET
	DOME – HEIGHT IN FEET
	STALACTITE, STALAGMITE, COLUMN
	FLOWSTONE OR RIMSTONE POOLS
	POOL – PERENNIAL, INTERMITTENT
	STREAMFLOW DIRECTION
	STREAM WITH RAPIDS

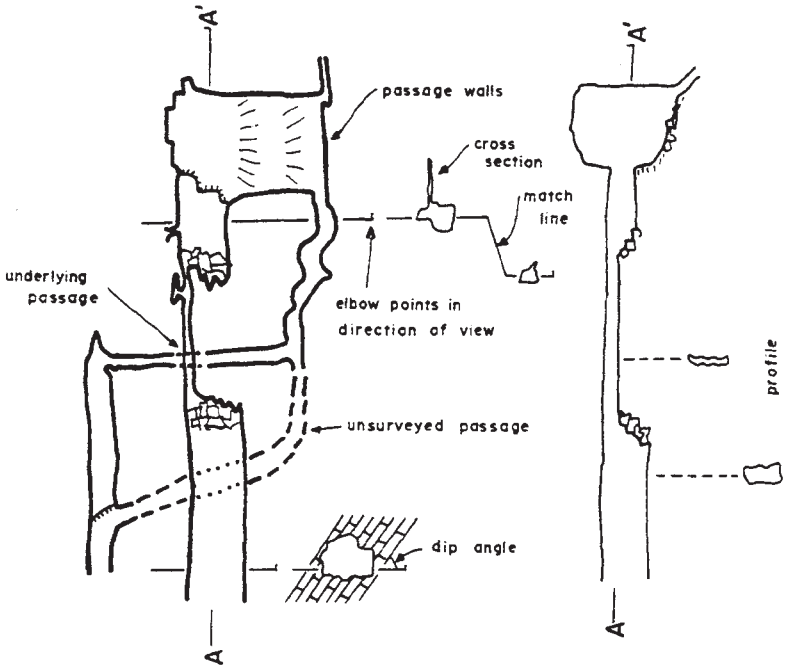
Cave Map Symbols from Cavern Development in the Helderberg Plateau, East-Central New York by Ernst H. Kastning (Bulletin 1, New York Cave Survey, 1975, p. 165)

NATIONAL SPELEOLOGICAL SOCIETY

PROPOSED STANDARD MAP SYMBOLS
1 June 1961

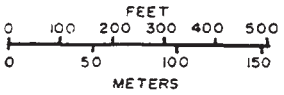
MOTION: That the cave map symbols listed below be officially adopted by the N.S.S. for use on all society maps and be designated "Map Symbols: N. S. S. 1961 Std."

Redrawn with emendations, 30 April 1968 JAMES HEDGES



TITLE BLOCK

1. name of cave, county and state in which it is located
2. precise coordinates
3. graphic scale



4. magnetic and geographic north
5. date of survey
6. principal surveyors
7. type of survey (instruments)

- all measurements given in feet except where otherwise noted

THE PASSAGES


surveyed passage


unsurveyed passage


underlying passage

unexplored passage


continues, narrow

continues, low

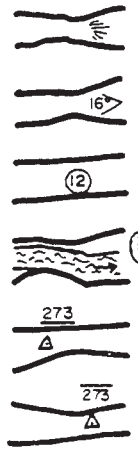

breakdown choke


(other detrital) fill choke


flowstone choke


sump (voûte mouillante)

vertical drop, distance stated (hachures on lower side)



slope (lines diverge down slope)

measured slope

ceiling height

air space
water depth

elevation, above entrance

elevation, below entrance

DETRITAL SEDIMENTS

clay or silt

sand

crystalline fill

cobble fill

guano

chip or slab breakdown

block breakdown

mud flow

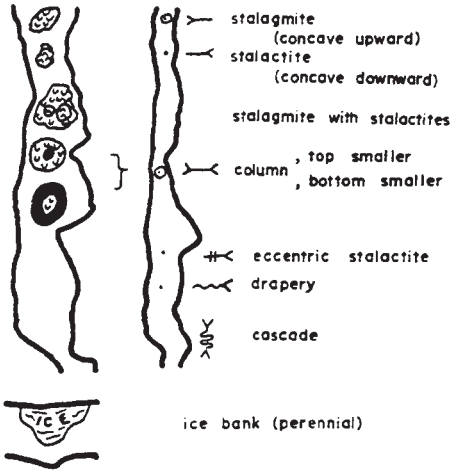
CHEMICAL SEDIMENTS (SPELEOTHEMS)

rimstone (convex downstream)

flowstone

flowstone covered wall

FOR SMALL SCALES / FOR LARGE SCALES



stalagmite (concave upward)

stalactite (concave downward)

stalagmite with stalactites

column, top smaller, bottom smaller

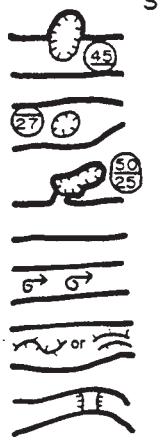
eccentric stalactite

drapery

cascade

ice bank (perennial)

SPELEOGENS



dome, height above floor

pit, depth below floor

vertical shaft (domepit), height above and depth below floor of intersecting passage

scallop (arrow points downstream)

ceiling channel

natural bridge

HYDROLOGY

large stream

small stream

intermittant stream

pool

waterfall

siphon (voûte mouillante)

ARTIFACTS

dam

survey station

stairs, dot indicates base

trail

ladder, dot indicates base

mine (guano, petre dirt, etc.)

bridge

FEATURES OF THE LAND SURFACE

shelter cave

karren

horizontal cave

pit, depth

pit with cave

pit with waterfall

cave with sinking stream (swallet)

cave with rising stream (resurgence)

spring, seep

swallow hole

doline

STRUCTURAL SYMBOLS. It is proposed to accept those of the American Geological Institute without modification.

LITHOLOGIC SYMBOLS: It is proposed to accept those of the U. S. Geological Survey without modification.

ASSOCIATION FOR MEXICAN CAVE STUDIES

STANDARD CAVE MAP LEGEND

PASSAGE SYMBOLS


Passage Outlines


Lower Level Passage


Upper Level Passage


Unsurveyed Passage

Survey Station

Ceiling Height

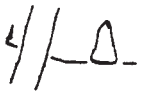
Depth below entrance

Height above entrance

Sharp drop in floor level in hachured direction (vertical distance)


Slope, down in splayed direction

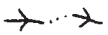
Pit, with depth-if so indicated, pit entrance


Cross section of passage viewed in the direction shown by half-barbed arrow (cross section rotated to the horizontal)

Profile trace

WATER SYMBOLS


Direction and flow of water course in permanent stream (air flow if so marked)


Direction and course of intermittent stream


Standing water; lakes or pools


Temporary or intermittent pool


Siphon (cross hatched)

Water depth, under ceiling to water height

NOTE: On all maps indicate if figures are in feet or meters.

STAL SYMBOLS


Rimstone dams


Flowstone on floor


Masses of flowstone on walls, or flowstone partitions


Flowstone Column


Stalactites


Stalagmites


Soda straws

CEILING SYMBOLS


Sharp drop in ceiling; hachures point toward low ceiling


Dome, with height

FLOOR SYMBOLS


Bedrock floor


Clay


Sand, mud, or dirt


Gravel


Talus


Large individual breakdown block


Masses of breakdown


Guano


Pottery or other archeological rdmains

GEOLOGY SYMBOLS


Strike and dip of strata (dip in degrees)


Vertical joint

Dipping joint, dips toward side with block

Fault, D side moved down relative to U side

NOTE: In all cave passages the composition of the floor should be indicated.

Discussion of Map Symbols
by Bill Russell

The purpose of a cave map is to give an accurate, easily understood, visual impression of the cave as a complex three-dimensional void extending through the earth. And to accomplish this, many special symbols are used to indicate features found in the cave. Many of these symbols, such as the breakdown symbol, are simply a diagramatic expression of the actual feature, while others like the number in a circle for ceiling height are purely artificial conceptions. And the more detailed a cave map, the more important the artificial symbols become. Many modern cave maps could not be understood without a list of symbols. The standardization of symbols is important so cavers of all areas and languages can easily communicate. An important step in this direction is the adoption of a set of standard symbols by the NSS.

Unfortunately, the only list so far presented to the NSS is the Hedges list, a very lengthy list that contains many unacceptable symbols. Cave mapping is generally not the type of activity that generates political discussion, but the time has come for all cave mappers to make some political noise or the NSS board of governors will take our silence for agreement. First, I would like to propose that the NSS adopt the AMCS set of map symbols, calling it for convenience the "NSS Standard." The AMCS symbols are better adapted to contemporary cave mapping, and the adoption of the same set by both organizations will unify cave mapping over a wide area. The discussion that follows is intended to point out the numerous advantages of the AMCS system, and to indicate some of the various choices available in choosing a set of map symbols.

Any list of symbols is a compromise between the large number of possible symbols and the number of symbols the map user can be expected to know. The AMCS list can be adequately presented on two pages and contains 41 symbols; the revised Hedges' list is 19 pages long and contains 163 symbols. The Hedges list includes a large number of specialized symbols, including symbols for both warm and cold air currents, polluted and potable water, mold, fungus, and even coprolites. To be useful the Hedges list will have to be severely revised, with the commonly used symbols printed as a short two page list that could be easily utilized. The rest of the symbols should then be collected and issued as a list of special symbols, to be annotated on maps where they are used. This supplemental list could include symbols for various types of archaeological material, special cave features such as mud cracks, ripple marks, high water marks, and numerous man-made features such as core holes and electric wires. The supplemental list will provide a suitable symbol to show these features, and insure that all cavers use the same symbol. The Hedges 19 page list is a valuable compilation of map symbols but is too long to be adopted as a standard list.

Símbolos: 1. pared de la cueva: 2. dolina: 3. estalactitas etc: 4. derrumbes: 5. tierra: 6. guano de murciélago: 7. pendiente: 8. gours.

Cuban Cave Map Symbols

Many of the symbols on the Hedges list could be improved, and others are in conflict with symbols widely used by cave mappers. One of the worst features of the Hedges list is its representation of domes. A dome should have a unique symbol and not depend upon the user to look around for a circled number. Numbers should be avoided whenever possible, but this system is especially cumbersome, particularly in view of the AMCS alternative, to use the broken hatchured line to indicate a dome, just as it is used for other ceiling features. Hedges revised list uses a number in a square to indicate pit depth, and a number in a circle with a line under it to indicate the height of a dome. These cumbersome symbols would not be necessary if the broken hatchured line were used to show a dome as the poorly chosen symbol used by Hedges also indicates a mesa, so additional notations are necessary. Hedges' natural bridge symbol is not needed and can only confuse, as it indicates a short section of passage between two drops, a common enough occurance in caves. If a natural bridge is not present Hedges symbol will imply one. Using the AMCS list one need only add a lower level symbol and a natural bridge is unambiguously indicated. Hedges' notations for streams and pools, retained in his revised list, are hard to draw, and his pools are easily mistaken for large masses of flowstone, not common in the caves where Hedges usually maps, but an NSS list should be useful over a wide area. His flowstone symbol could be improved, and a cave map draftsman should never break the wall line to show a flowstone covered wall as indicated on Hedges list. The crossed pick-ax and shovel should not be used to represent a mine on a cave map; the symbol is used on surface maps of large areas, and its use as shown on the Hedges list would be inappropriate. The actual diggings should be shown with conventional symbols.

The Hedges list also contains symbols that are confusing as they are used by others to show a different feature. Especially poor is Hedges use of diagonal lines to indicate a bed rock pillar as this symbol is widely used to indicate water. And the small solid triangles are used by many to indicate stalagmites and should not be used for chert.

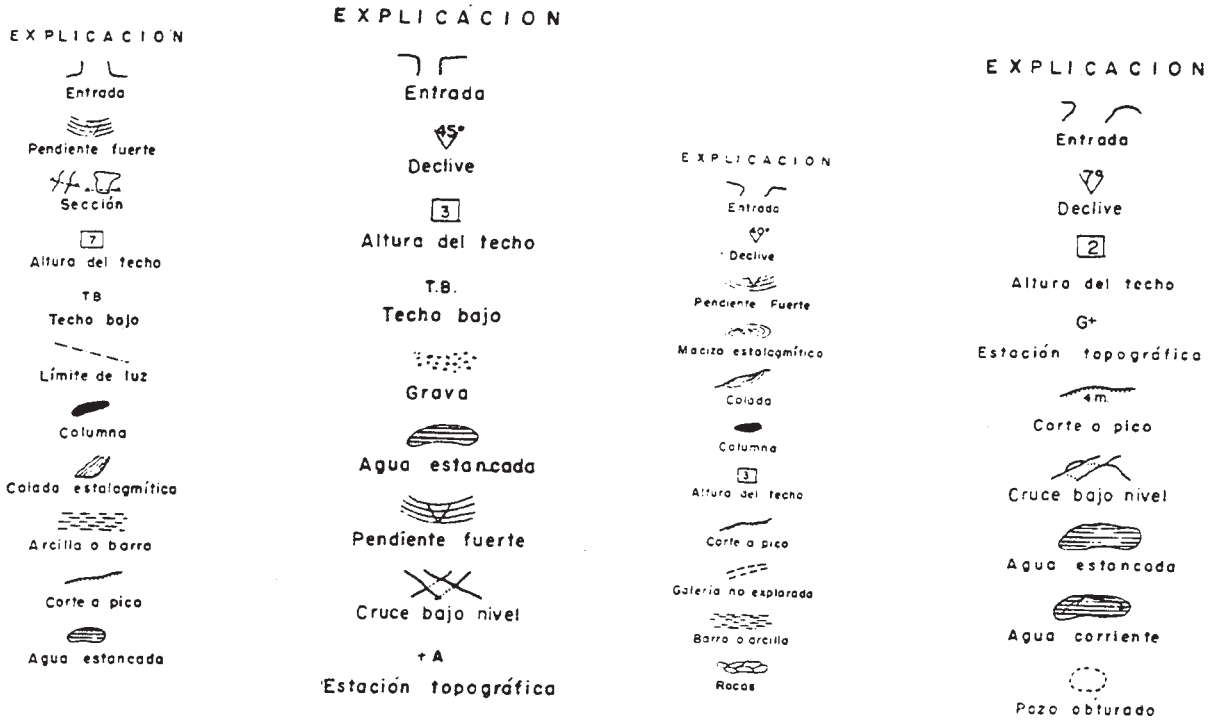
The notation on the 1961 list that feet are to be used unless otherwise noted will cause trouble in an increasingly metric world. I hope this feature is not retained in his revised list; my copy makes no mention of units. Considering Hedges' French equivalents on the 1961 list (a sump is also a voute movillante) he should realize that many people routinely use the metric system. So until the far distant future when inches and feet are as rare as leagues and varas, there will be an uncertainty about what units are being used on a map, unless they are explicitly stated. There are several approaches to this problem. One is to use as few numbers as possible and rely on the graphic scale. It should be possible to interpret a cave map without any reference to figures on the map other than the graphic scale. Passage heights and pit depths should be clear from cross sections and profiles. But while numbers should not be necessary, they are useful as they provide the user with exact dimensions. Every map should contain a clear expression of whether feet or meters are used. One cannot rely on the Hedges system of assuming measurements are in feet unless indicated. I doubt if a caver who rappelled off the end of his 150 foot rope

Símbolos: 1, pared de la cueva; 2 formaciones secundarias; 3, derrumbes; 4 borde del techo en la boca de la cueva; 5 pendiente; 6 tierra; 7 arrastres consolidados de origen fluvial.

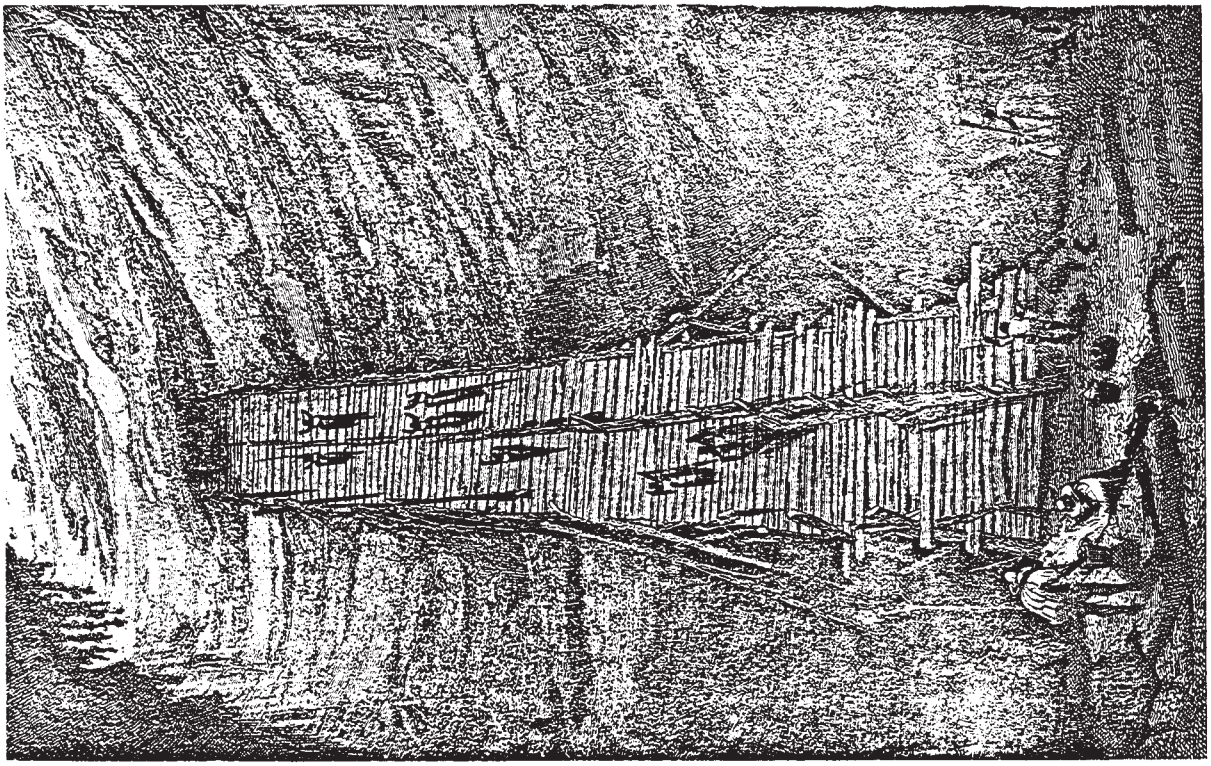
Cuban Cave Map Symbols

in a 90 meter pit could collect damages either from the map maker or Mr. Hedges, but with foresight these problems can be minimized.

The revised Hedges list is an improvement over the 1961 list presented here as he now uses the broken hatchures for ceiling features, but he needs to expand its use and use it for all ceiling features including domes. Cross sections are the best way to show heights of domes and depths of pits when the shaft extends both above and below the passage. His revised list also includes a symbol lacking on the 1961 list, a symbol for a bed rock floor. He proposes a rectilinear crosshatch be used, but even he admits it is a poor symbol, and suggests that it be used only when absolutely necessary, that normally if floor sediments are mapped a blank space will represent a bed rock floor. This is a poor practice as cave mappers frequently do not have data for some of the cave, a good bed rock floor symbol would be much better. Hedges new list still has a cumbersome system for indicating pits and domes, as well as other symbols that are confusing or inappropriate. It should not be adopted as a standard list by the NSS as it would not meet with general acceptance, and would be a setback to the slow progress being made towards the adoption of a uniform system of map symbols. The set of symbols used by the AMCS should be adopted as it is a versatile and practical system in wide use and acceptable to a greater number of cavers.



Mexican Cave Map Symbols



ACTIVITIES LETTER
AMCS MEMBERSHIP COMMITTEE
Box 7672 UT Station
Austin, TX 78712

AMCS ACTIVITIES LETTER

Edited by Bill Russell

Typing and Editorial Assistance
by Pat Asnes

Fall Report Letter No. 3 Oct 1975

The AMCS Activities Letter is published by the Membership Committee of the AMCS to keep members informed of recent speleological activity in Mexico. Brief accounts of current trips are welcome.

This third AMCS Activities Letter covers the summer and fall of 1975. Activity as usual was centered in the Cd. Valles-Cd. Mante area of northeastern Mexico, but this summer cavers crisscrossed Mexico from the south bank of the Rio Grande to the beaches of the Caribbean. The last part of this issue is again devoted to a discussion of map symbols. This discussion has become more far-reaching than just reconciling the differences between the AMCS and the Hedges lists. Discussions have included the optimum number of symbols to be included on a list, the types of map lettering, and even the desirability of such almost universal symbols as the circle around the ceiling height. From these discussions should come a list acceptable to all cavers. The money to pay for printing the lengthy discussion of cave symbols comes from a special AMCS political slush fund. This fund was established when I was editing the first issue and the IRS needed overtime work to get out the rebates on time, so I decided to delay the first issue and use the money to print extra pages in the Activities Letter.

The cover of this issue of the AMCS Activities Letter is from an engraving by Frederick Catherwood of the Mayan ladder in Xtacumbilxunam, a large cave in northern Campeche. This engraving is reprinted from the John Lloyd Stephens book Incidents of Travel in Yucatan first published in 1843. The ladder was constructed by the Indians to bring water from the lower levels of the cave when the shallow wells in town went dry. This drawing is especially appropriate as a similar ladder is still in the cave today and was used this summer by AMCS members.

Steve Zeeman and Dino Lowery are now returning from the cold and dark of Alaska and should be back in time for Dino to do an original for the Christmas-New Year Issue.

Pierre St. Martin is now 1270 m. deep -- the French connected the M3 shaft with the upstream section.

From Norm Pace

If you need a new membership card, don't hesitate to write -- membership cards were printed free for the AMCS by Ronnie Fieseler and he used all the scrap paper in the print shop which produced enough cards to completely fill the average Iowa cave -- so we can easily send anyone an extra.

1975 Yucatan Expedition
James Reddell, David McKenzie, Suzanne Wiley, and Andy Grubbs
By Andy Grubbs

We left Austin on June 12 and drove for three days to the state of Tabasco. There we visited Grutas de Cocona near Teapa and Cueva Azufre near Tapejalapa. Cueva Azufre has a small sulfurous stream that swarms with hundreds of pink half-blind mollys. Roots reaching down into the water are covered with sulphur crystals. To reach the cave our guides poled us 1 Km. up the river in a canoe and then we hiked another Km. through the jungle. The next day we visited the ruins at Palenque and swam in the last river we were to see before waterless Yucatan. Two days later we met Dr. Mitchell, his family, and William Russell at the cave Xtacumbilxunam in northern Campeche. Here we split into two groups to check the cave; one group explored a previously unchecked 30' drop and the other climbed down a 70' wooden ladder to search for the elusive river beyond the siphon lead. At the bottom of the drop, a passage lead through a squeeze to a second unclimbable drop, later pushed by the mapping team to another unclimbable drop. The siphon was still blocked by high water. The next day we looked for blind fish caves near Ticul. The next three days were spent near the village of Cumpich where we checked several small caves; one was the deepest free-fall drop in the peninsula, a 190' blind pit. We saw several promising caves that we didn't have time to enter. Most of our time was spent at the ruins of Kalumkin (Mayan for "throat of the sun"). A cave in the midst of the ruins has two entrances, one a pit 25' deep and 25' across and the other a small hole in a cornfield, leading to a 20' by 25' high main trunk passage and small, low, rock-and-dirt-filled lower levels. Mapping in several of the main passages had to be stopped because of bad air, but we did map 2850'. After Cumpich we rested in Merida and then left for southern Yucatan and northern Campeche. We spent three days finishing the map of Spukil, a very large cave of large interconnected rooms. Part of this cave is very warm and is not a pleasant place to map in. A lot of the formation areas are black and white, the black caused by soot from the torches of the ancient Mayas and the white caused by new crystal growth. After mapping Spukil we left for Grutas de San Jose and, though not finding it, we did find three other large caves. One of them was Grutas de Huachap which is located at a small ruin consisting of four temples overgrown with jungle. The entrance to the cave is a pit 50' deep, 50' wide, and 75' long. The cave has an old footpath that leads back to a small pool of water. We found a lot of charcoal on the floor. On our way out, we discovered a large side passage that we didn't explore for lack of time. We returned to Merida stopping on the way at several small caves and at a very nice swimming cenote. In Merida we put William on the jet to Houston and met with the Mitchells, then left for northern Quintana Roo, where we spent five days camping on the beach at Pamul and visiting nearby caves. Most of these caves ended rather quickly in water but we managed to do some good collecting. Near the extensive ruins of Coba, we visited a couple of small caves; one had a blind eel. The Mitchells left for the states, taking Suzanne with them, and we moved further south, along the road from Fellipe Carillo Puerto to Valladolid. One cave along this route was a small cenote at an abandoned ranch. The cenote was a room about 30' in diameter and 40' from the skylight to the water level with a side passage extending from the surface to a mid-level ledge. In the water were lots of large cave shrimp and isopods. Twenty feet below, the bottom could be seen as it sloped off into darkness.

We spent two days near Valladolid; the first going into six caves and the second returning to the cenote at Catzin for further exploration. The Catzin cenote is a pit 50' deep and 100' across at the surface and the bottom is undercut and much wider. The cenote functions as a well for the villagers of Catzin. It is possible to rapell down to the central island and from there six passages are visible around the edge of the cenote wall. These tunnels contain several hundred feet of branching passage.

continued

After leaving Valladolid we went to Merida to rest and to pick up Suzanne and then travelled to northern Campeche to map in Xtacumbilxunam, Kalunkin, and finally located San Jose. We then went to Kaua in central Yucatan where we tried to find and map the left wall of this incredible maze; we didn't find the left wall but we did extend the map of the cave much further to the west than anyone had imagined it would go. The total mapped length is now 22006 feet; it is certainly the longest known cave in Mexico. Then we returned to Merida for a rest. The last leg of our peninsular caving was a swing through central Quintana Roo to Chetumal and then across Q.R. and southern Campeche to Escarcega. First we stopped at Loltun in southern Yucatan and spent three days mapping about one third of the Loltun cave. Loltun is a very diverse cave with some skylight areas, some large 75' by 75' main passages, and complex areas of small rooms where formations have come down to the floor making partitions. It rained the first two days we were at Loltun, causing a shower of water to come out of a high dome near the entrance, forming a small stream which ran down the side of the main passage and sumped in a small side passage. After we left Loltun, we went to central Quintana Roo where we visited a few small caves and then drove south all the way to Chetumal without finding any caves, though we did find a very fine lake to swim in. On the road from Chetumal to Escarcega, we also found no caves, though in southern Campeche we did find a few tiny dry dusty caves near Spukil along with some unusual ruins. 107 Km. east of Escarcega we found a large cave, Volcan de los Murciélagos, estimated to be 500' deep and 4,000' long. This cave is one of the largest and deepest caves in the peninsula. It is also the most horrible. The cave houses a colony of Mexican freetail bats that takes at least three hours to fly out of the cave. The evening flight of the bats can be seen from the highway. The entrance is a large pit 120' in diameter with a steeply sloping bottom. At the top of the slope it is 200' from the surface to the bottom of the slope. The slope is composed of old guano and small rocks and descends at least 200' to a short horizontal passage that ends in breakdown. By climbing down through the breakdown a small passage is reached that soon opens up into the main cave, a passage about 60' by 30' with a flat ceiling and walls that slope down toward the center. In the lowest places are some lakes and quick-guano pools. We tried to wait until the bat flight was over before entering the cave but one hour and forty minutes after the flight started, we decided that we would rather face the bats than stay out in the mosquitoes, so we entered the cave; two-thirds of the way down the entrance slope the bats became so bad that we had to hide behind some breakdown in the side of the passage. After an hour of waiting, the bats abated slightly and we were able to get down to a place where they were flying over our heads. The cave was very hot and unpleasant and we only stayed long enough to run to the back and then run out. We immediately left the area and drove to Escarcega. The next day we went to a couple of small caves nearby including one near a famous shrine. James then left for Merida and we headed north. We stopped at the river near Palenque to swim again and drive to near Cuidad Valles where we stopped for two days of caving using the new topographic maps. We were in the mountains west of Valles and found lots of 60' pits, saw a cave that was normally 45' down to a stream passage that now had a spring flowing out of it, and we found a lake that drains into a large sumidero. Except for August and September, the lake is dry all year and the cave that drains it and the caves that empty into it are dry. We drove on west from there and stopped at Sotano de San Francisco and saw the stream that runs into the 300+' entrance pit during the rainy season. We also visited some small caves near there, in an 8000' high karst area called "Valle de los Phantasmos", so called because of the strange karsted rocks found there. We then drove back to Texas stopping in the desert between San Luis Potosi and Matehuala where we got a lead while eating a watermelon.

continued

We were gone 54 days and travelled 6500 miles, visiting 50-60 caves, mapping some of the more important ones, and doing a lot of biological collecting.

The End

Incident of travel in Mexico
from a letter from Ernest Garza:

...Then to Queretero and the Keystone Kops Kaper. Arrived at 1:00 A.M. -- large modern well-lit bus terminal. During my second visit to the restroom -- (my insides weren't quite right) -- two policemen approached me asking what I had in my pack. I told them what I was doing and they replied they wanted to take a look, so I started taking shit out of my pack. I had nothing to hide. Before I had all my stuff out they replied that there were two things not allowed -- my machete, which was wrapped in paper and stuffed carefully in the pack, and an open bottle of Tequila. He grabbed the machete, unwrapped it, and swished it through the air a couple of times saying "Este es una arma!" He said he had to take it to his commandante and I would probably be fined 200 pesos. He would disregard the bottle for the moment. No amount of rational talk would discourage these pricks as now they were looking for blood stains on the blade. These two apes told me to stay put -- they were going to call the commandante. They walked out the door and I through another into a waiting cab -- its driver reading a newspaper. He had a small car and I suppose he was startled by this guy jumping into the back seat with a full back pack. I was still struggling with my waist-strap trying to get it all in when I said "Vamanos" and he sped away. Spent a restless night behind a trailer park and walked to the highway and caught the first passing bus.

Morphologische Entwicklung Ausgewahlter Regionen Nordmexikos Unter Besonderer Breucksichtigung des Kalkrusten-, Pediment und Poljesproblems. By Gerd Wenzens. Dusseldorfer Geographische Schriften, No. 2. 330 pp. 14 maps, 17 figures, 1 table, 44 photographs. Dusseldorf, 1974. Price 45 Duetschmarks.

The author has studied three Mexican regions: Valle El Salado, Comarca Lagunera, and the west part of the Sierra Madre Oriental. The synthesis of regional results deals with the problems of Basin Ranges, of pediments, of karstic basins, and of calcite crusts, making a reconstruction of the origin of the relief possible. These studies show that it is not essential to assume large variation in the total amount of precipitation; the distributional changes through the year could also be the cause. This book gives many impressions about the evolution of karst landforms as one of many factors that act together to influence the morphogenetic process. Available from Geographisches Institut der Universitat Dusseldorf, D-4000 Dusseldorf, Universitatstrasse 1, West Germany. (2.4 Deutschmarks = $1.00)

UIS Bulletin (Union Internationale de Speleologie)
1974 v. 2 no 10, p. 21
Translated by G.G. Forney, NSS Int'l Secy.

By Bill Stone as told to Bill Russell

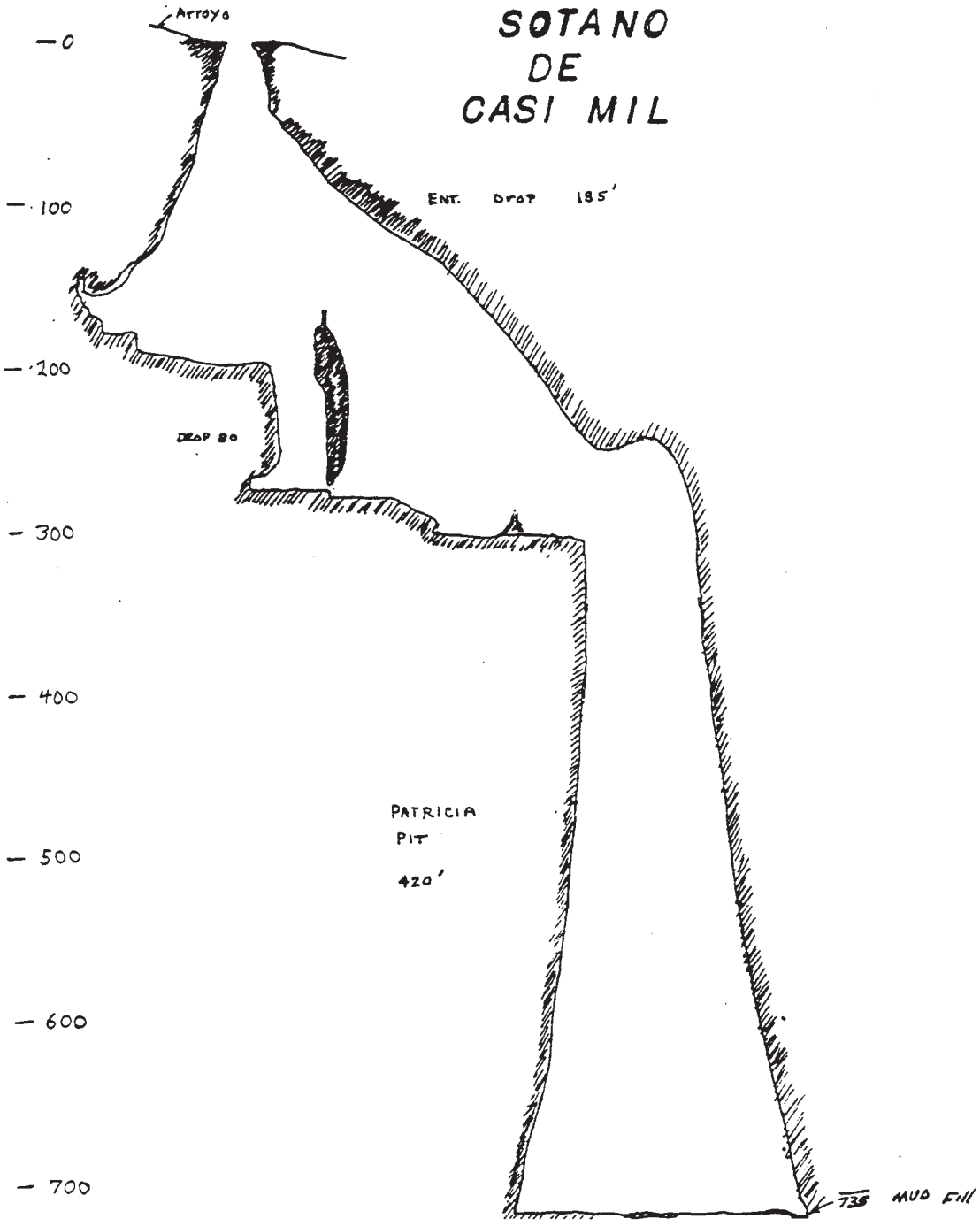
Bill Stone & Pat Wiedeman

We planned to meet Peter Sprouse, John Polak, Norm Pace, and group to visit the high parts of the Sierra de Guatemala, but our timing was off and we did not find them at the Nacimiento del Rio Frio. So we decided to drive up to the Otate Mine at the top of the Sierra de El Abra north of Valles. To cross the ranch by the highway one needs to get permission from the comisario at the ranch headquarters. We gave him an Activities Letter and found that if cavers would bring him maps and pictures, it would be good public relations and he would not think we were part of the CIA. We arrived at the mine and decided to check the sump in Sotano de Otate. We soon found the entrance and rapelled in, but an exhaustive search failed to find the 560 ft. pit -- and finally we realized we were in Cueva de los Indios.

Next we chopped from our camp down into the Diamante Sink following a small arroyo to a 10 X 3 ft. entrance to a pit. Excited at our find we congratulated ourselves on finding a virgin pit this close to camp -- only to notice that a tree by the pit was flagged with colored ribbon. We realized that we had chopped to the pit above Cueva de Diamante but in checking our copy of the Activities Letter we discovered the pit had not been entered. So we returned to the pit and rigged the entrance, a 185' free drop. At the bottom we popped through a small hole to a 35 foot climbdown to the top of a 5 1/2 second pit. We returned to camp and now loaded down with over 1000 feet of rope, cave packs, bolt kit, and other gear, we trudged back to the entrance. After double rigging the entrance we reached the top of the big pit, and started down. The first 90 feet were against the wall, but then the pit began to bell out, and 300 feet down the pit was about 100 feet in diameter with the rope hanging in the center -- similar to Fern. We landed on a flat dirt floor with a mud sump at one side -- at a total depth of 735'. The pit we named Patricia Pit was 420 feet. During the rapell, I began to feel the effects of an encounter on the way to the pit with a Mala Mujer (the giant Mexican stinging nettle) and became dizzy and momentarily fainted when I got off the rope. I quickly regained my balance but realized how extended a two person group is in a 700' pit system. We decided to name the pit Casi Mil -- almost a thousand.

Returning from the Otate Mine we spent two days recovering at Micos, then walked up to Sotano de las Golondrinas. The climb out of Golondrinas was an almost psychedelic experience. There was an oscilating cloud at the 600 foot level with a hole burned through the middle by the sun. As we climbed out through the hole, sunlight formed circular rainbows around the climbers. Well worth a cold night under a wet blanket.

The Canadian Caver, Vol. 7, No. 1, contains more information on the trips to Chiapas briefly mentioned in the last AMCS Activities Letter. As usual there are excellent maps of the largest caves visited: Sumidero Yochib, Chen-ven-sil-mut, Sumidero de la Hondida, and Cochol. The Canadian Caver continues to be the best caving monthly printed in North America.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June 9

Dear AMCS

RE: Diamond Cave

After considering my telephone call with Andy Grubbs and reading AMCS Activities Letter #2, it seems that there may be some potential passage overlooked by the group in March. When we descended into the "Crystal Room" last Christmas, we followed along the right-hand wall, and ended up on the "bottom" about 30-40 feet above the floor of the Crystal Room as described in the Activities Letter #2. From the "bottom" as we knew it, one could duck under a natural bridge, or climb up on the bridge, and see down to the "true" bottom of the Crystal Room as seen in March 30-40 feet below. One could also see upwards, and so I assume the group in March descended basically trending to the left, and bypassed our intermediate level and ended up directly on the bottom, where the "Titan Missile" is (we were above the top of the Missile, but could clearly see it). The potential passage I refer to is reached by going the opposite direction from the natural bridge, into a narrow, jagged, sloping crevice. After a couple of relatively difficult climbs, one finds oneself looking down another pit, probably 50-70 feet deep. This is the one I described as having a large passage coming in just below the lip, but which would require rope to reach. It moved air.

Mark Minton

Price Increase on Mexican Topographic Maps

The prices on the 1 : 50,000 CETENAL topographic maps (15 X 20 min. quadrangles) have been increased from 5 to 10 pesos (40 to 80 cents). When ordering by mail, also allow a 5 peso (40¢) money order charge. If you will be in Mexico City, the main office is only a few meters from the San Antonio Abad subway station.

Oct. 12, 1975

Dear Craig,

I am writing to you as AMCS correspondent to make connections for Xmas trips to Mexico this year. Our party will be in Cd. Valles about Dec. 22 with a car and 4 seater Cesna airplane. Bob Stricklen, the pilot, and I are both experienced vertical cavers and would like to link up with groups in the area to visit whatever caves groups are doing and offer the use of the plane at cost to anyone needing the service to discover photograph, or check out caves. The plane might also be available for transport to other caving regions, depending on the situation and we have tentatively decided to fly to Guatemala to visit friends and local ruins. We must return approximately Jan. 1 or 2. Please forward this letter and/or communicate our request/offer to anyone planning to cave in Mexico at Xmas. This especially applies to Frank Binney if he will have returned from New Guinea. Tell all to write soon if interested to:

Kelly Kellstedt
Route 6
Box 134
Santa Fe, N.M. 87501

505-471-2333

Trip Summary
Bill Stone, Steve Ward, Spencer McIntyre, Ernie Garza, Blake Harrison, and Jill Dorman
By Bill Stone

After the hordes of cavers disappeared from the Sierra de Guatemala Fiasco, six remained in my truck to maintain the search for the "mile deep" hole. We had a good lead from John Graves of a large-entranced pit taking water up near Cuevas Minas, so we all drove up to San Francisco the first day. All but Steve and I dropped Sotano de los Lobos (620'). We went karst-whacking for about 6 hours (7-8 miles), finding two small pits, the largest perhaps 60' deep. The next day we drove out to Cuevas Minas and met an American geology student there who showed us all of the new air photos of the area. Graves' arroyo leaped right out when we used the stereoscope—right on the "contact" ! (John Graves from San Antonio, Texas, had originally located the pit.) It had rained most of the night so we had some slippery 4 WD'ing up to the cave, which was in a fairly obvious depression to the right of the road. The main entrance was about 70' tall and 30' wide — impressive. A side entrance bypassed the 30' entrance drop and we bombed on down the steep breakdown slopes to a 40' drop at about -40m. About this time we noticed a peculiar smell in the cave. Upon inspection Steve pointed out the stream of human feces entering from a small passage and going over the drop. SHIT ! After the 40' drop was a 10' drop to water. Another 400' of caving and downclimbing lead to another 40' drop, passing by beautiful orange pools of fungus ! The 40' drop lead to a 30' drop and terminal siphon at -120m. So we christened it "El Sotano Feo del Arroyo" for lack of a better name. We 4WD all the way to San Francisco coming in on the Lobos road and returned to Valles. Harrison and Dorman split via bus and the four of us left for a week at the Otate Mine.

I should mention — before Blake left the summer rains came in and it rained heavily for two days without let-up. Imagine trying to get up in a heavy downpour ! We all put wetsuit tops on at Los Sabinos and walked out to take a look at flood stage Sotano del Arroyo. We heard the rumbling from the trail, but when we arrived at the entrance it was awe-inspiring ! For anyone who has been there — imagine 1200 cubic feet per second of water pumping in the entrance drop ! It makes Yo Chib look tame ! So we figured with all this water going in here, imagine what the Choy is like ! The lower entrance to the Choy was completely underwater and 4' geysers erupted from the resurgance ! We estimated around 5000 cubic feet per second of flow.

Well anyways, back to Otate — The mine road really got wiped out by the rain and it took some aggressive 4WD'ing to make it. We packed up for a 4 day "black hole or perish" chop from the Estrella Sink. It took over 6 hours to get to the star-shaped depression, as we had to re-chop large sections of the trail with 70-80 lb. packs. We set up camp near Sotano de la Estrella and began our search. We chopped a major trail due west from camp which extended well over the west ridge. Then, spacing ourselves about 100' apart, we compass chopped south for over a kilometer and reversed the formation back to the main trail. This went on till we returned to camp.If the hole was as big as Russell said, we figured, we couldn't possibly have missed it. So we chopped further west to a knoll and found a 40' high tree which afforded a view of the western crest for over 10 miles. So we sat in the tree for over an hour, hypothesizing that if the pit were actually 100' in diameter, it would certainly have a parrot population. We spotted four distinct clusters on a 22 E of N bearing and chopped for over a kilometer on that bearing — right into the back of Cuesta ! Not random luck at all — we refound Cuesta with only a 50' error in the chop line. If the black hole was there, we would have chopped right into it. There may be a small chance that we just didn't wait long enough to get the right bearing on the black hole, so I invite all the birdwatchers to go out to that tree and look for another "parrot bearing" — Good Luck.

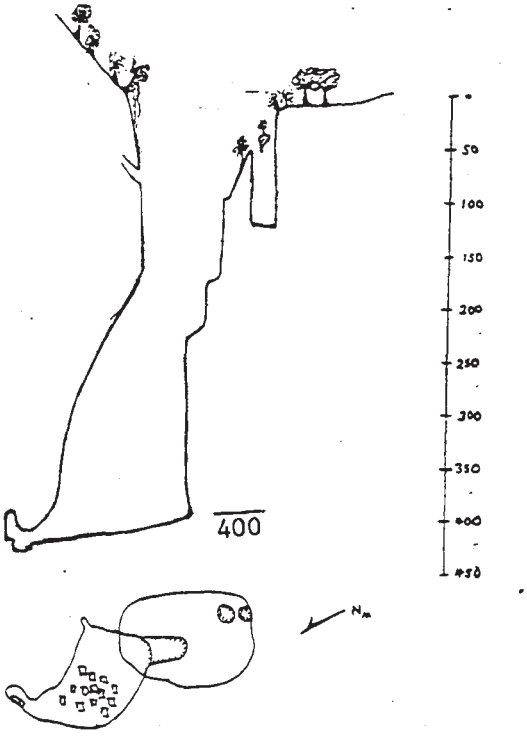
continued

Anyways we speleo-bopped Estrella and Cuesta, getting some interesting photos of disabled macaws on the floor of Estrella. These great beautiful birds are in reality quite spastic; we saw several fly gracefully into a wall of the pit and fall 100' to the floor -- it was pitiful after a while! It rained when we did Cuesta that afternoon so no "ray of light" shots were forthcoming. We hiked back to the truck the next day and tried to get a lead on the fabled "15 minute" pit, but the entire mining crew had split -- lock stock and shovels. The place looked like a ghost mine !

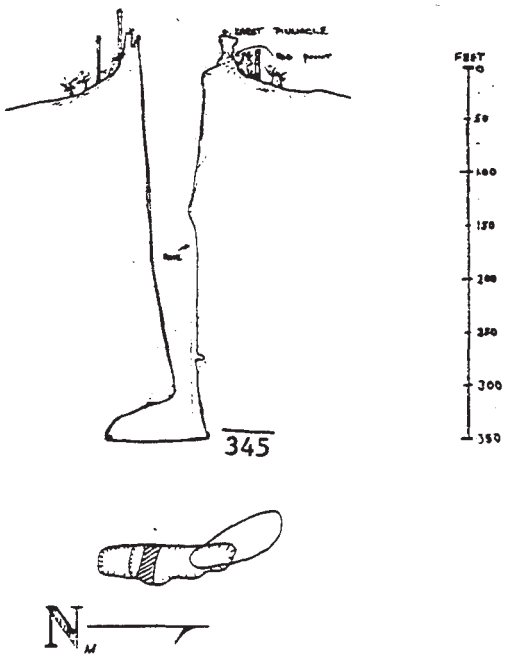
The next day we chopped around the Diamante Sink in radial patterns and found a 2' X 3' hole. This turned out to be about 130' deep, bottomed by Garza and McIntyre. Meanwhile I found 3 pits southwest of the road to camp. The largest of these was 50' in diameter, but bottomed at only 130'; the rest were just blind rabbit holes ! I should mention that we received a flagging tape message from John Pollack and Norm Pace who did Diamante the day I left for convention in June. They said they went down -500' on the Minton route but stopped when they noticed all the debris on the ceiling -- apparently it floods easily so they split, recommending a dry season push.

Upon returning to Valles, Ernie left for the states and Steve, Spence, and I drove to Tancoyol to begin our 4th week of the trip (7th for me). We had two leads to check, both required long hikes. The first trip left for Las Flores, two hours north of town. A new road will be completed in December, so it won't be quite so bad. From Las Flores we hiked to San Antonio, four hours from town. The locals knew of two "deep" pits nearby, so we hiked out without packs. They showed us a 100' pit near a karst pinnacle and another pit which looked considerably deeper, in a karst pinnacle nearby. This was Sotano de la Palma Real, a 345' free drop which we bottomed the next day. Somewhat further away (still muy cirquita on the Mexican scale) was El Sotano del Rancho El Tigre, a 150' diameter hole which gave some impressive sounding rock times. We bottomed this the next day also -- the entrance drop was 400' shear to a room about 60' in diameter.

Sotano del Rancho El Tigre



Sotano de la Palma Real



continued

Two days later we took daypacks and scouted 12 miles of trails leading to Rancho el Teposan and Joya del Mague finding no less than 25 leads, some taking water, some fairly large-entranced, and mostly 100'-200' entrance drops. The exception was a 40' diameter pit in Rancho Tabago which the locals measured at 100 m. +, using a rock and a piece of string -- until they ran out of string ! Could be a deep one ! Anyways. All this time we were camped at the house of Sr. Bernardo Dias whose hospitality, coffee, tortillas, and venison will forever be remembered. We also bottomed Sotano de las Flores on the return trip from San Antonio. At -305' it is basically one shaft with small offsets.

Incredible public relations have been established in Tancoyol and surrounding areas. Lets hope everyone who goes there strives to keep it that way.

We arrived in Savallo two days later and made plans to hike to Tierra Fria where a 40 m. diameter pit was reported -- only two hours from Savallo. Steve was recouperating from some bad blisters and decided to bag the hike the next day. He must have been clairvoyant ! Spencer and I began what can only be called an epic journey ! Six hours after starting we arrived in Tierra Fria, not the two hour jaunt we were expecting ! Upon questioning the locals we learned to our incredible amazement that not only was there not a 40 m. diameter pit in town, but they didn't know of any pits at all less than 3 hours away ! Hay caramba.

So we hiked another 1 1/2 hours to Rancho Mojonera. Supposedly the guy in Tancoyol who gave us the lead was born there. This at least turned out to be true. However, as for the 40 m. diameter pit -- not so good. The nearest sotano they knew of was at least another hour down the trail. Believe me when I say that we were at the end of our blue lines by then ! It was getting late and a rainstorm was coming in, and all we had were daypacks. Reluctantly we hiked another hour to the town of El Quirino. Here at least the locals knew of a nearby pit. They said "Its very deep we think, due to the arroyo which leads in" to which my trail-benumbed mind instantly snapped out of its stupor saying "arroyo? arroyo?! going <u>into</u> a pit!" " Lets go". Well we followed the arroyo over 1/2 mile to the edge of a corn field where it made an abrupt left and dove into the blackness-- far out! The entrance was a little over 20' in diameter. The locals said water entered the cave every time it rained-- evidenced by the solution scour marks on the wall. Rocks bounced for <u>10-14 seconds</u> with at least 4 seconds of free-fall to start. The entrance is well over 7000' in elevation. So with this promising lead urging us onward, we decided to attempt to make it to the highway by dark which they assured us was not more than three hours away. The locals said there were many other leads like that one nearby but we optioned out on the hike at the time. The name of the pit was Sotano de Cagualin. Well an hour later we crested the western ridge and could faintly make out the Jalpan-Rio Verde Highway -- a long ways down ! The sun was going down fast so we really trucked for the remaining hour of light -- fortunately it was all downhill. On the way we intersected a new dirt road which the workman told us was being built to San Juan -- only 1/2 hour from the pit ! With this enlightening news we hiked three miles down the road in the dark. At this point we should have stumbled into La Purisima. But Mutha Nature didn't know we were coming and stuck this stupid river between us and the highway ! (Actually the Rio Jalpan) Not being able to find a bridge in the dark merely increased our consternation as neither of us wanted to swim across the river. So we went down the side hoping to find "something" to cross on -- "something" turned out to be a 5/8" wire rope suspended 30' above the river -- not exactly my ideal bridge -- but it was all we had. Soooo snugging up my 1" webbing belt on the cable for a safety I crawled across the cable for 300" to the other side. The only casualty was Spencers hat which fell into the river in mid-traverse !

continued

The adrenelin still pumping through my weary bod, we stumbled into La Purisima and had a few refrescos. We then sat in the middle of the highway trying to hitch a ride back to Savallo. No luck -- But the local bartender invited us in and proceded to get us totally wasted. (Not that we weren't already !) Around 2 A.M. we managed to get some sleep at a nearby house, whose friendly owner also stuffed us full of beans and tortillas. At 6 A.M. we were awakened by the shouting of "the bus is here" and we ran out, boots untied and gear dragging. 20 minutes of a hectic bus ride later we arrived in Jalpan. A short wait there and we were off to Landa de Matamoras. Things were going great till then, when we discovered how few vehicles went down the dirt road to Saucillo. So another 7 miles later we arrived at the truck -- 29 miles in 24 hours on foot and 30 miles of bus travel was about the most intense scouting endeavor I've ever experienced.

We split for the states the next day as I began my 3rd month in Mexico this summer.

Soledad Area Report

The latest, I think, issue of the Philadelphia Grotto News, Vol. 12, 1973, contains the long awaited report of the several trips by members of the Philadelphia Grotto to the Soledad Area in Veracruz. This mountainous area is located just south of Cd. Mendoza, Veracruz. The report contains a location map and a description of several caves written by Bob Kezell and Warren Heller. Cueva de Cerro (= Sotano Itamo) was surveyed to a depth of 1437 feet below the entrance. The cave has a vertical range of 1491 feet, and is the largest and deepest so far explored in the Soledad Area. An example of the importance of using the local name for a cave is illustrated by the remapping of the same cave by a group from Austin in June 1974. The Austin group recorded a depth of 1437 feet -- forty feet less than the Philadelphia group but the zero point of the Philadelphia map is above the zero point of the Austin map so the actual depths are very close. However, with the numerous potentially deep systems in the Soledad area it is unfortunate that a great amount of effort was duplicated in producing two maps of the same cave.

Bill Russell

Alpine Paleokarst

The thick cretaceous limestones of northern Mexico have been folded into sharp anticlines and the resultant fracturing has permitted the development of localized areas of sinkholes along the crest of the folds. The largest sink area yet investigated was on the Sierra El Laurel Quadrangle (G14C42) west of Saltillo. Along the crest of the Sierra la Concordia at an elevation of 3150 meters, several sinks up to a kilometer long had developed, but are now apparently being filled with alluvium. Another local cluster of sinks has been investigated north of Cueva del Porvenir on the Reforma Quadrangle (G14A61). These sinks have developed on the crest of the Sierra de San Marcos at an elevation of 1600 m. At this lower elevation the change from the more humid climate that favored the development of sinkholes to the present arid climate is more evident. Large alluvial fans are building into the main dolina, about 1 Km. long and 0.5 Km. wide. Several small sinks bordering the main dolina have been completely filled, the alluvium spilling over into lower sinks. It is apparent that, in the past, climatic conditions were more favorable for the development of surface karst, and karst features developed in the past are now rapidly being destroyed. Both these areas were investigated on almost the same day. Making the long climb up to the crest of the Sierra El Laurel was Maureen Cavanaugh, Blake Harrison, Jill Dorman, Mary Kraska, and Preston Forsythe. Back-packing into the Sierra de San Marcos were Peter Sprouse, Bill Russell, Logan McNatt and Speleocinematographer Thomas Moore.

The Illusive Pit
Terry Sayther, Ivy and Crystal Atherton, Gill Ediger, Dan Watson, Jill Dorman, Mike McKee, Paul Duncan, Jim Clements, Dorothy Tucker, Bill Mayne, Craig Bittinger, Patricia Asnes, Jim Moore.
By Craig Bittinger

The trip started from Austin and Corpus Christi on a Friday afternoon. A camping spot near Candela was selected as the rondez-vous point. No trouble was encountered crossing the border and around midnight Duncan's truck pulled up to the appointed spot. Three hours later the Austin group arrived after a slight wait due to Jim's shock absorber falling off. Morning soon came and a caravan formed and headed west from Candela. After an hour of bumpy road, the group approached a spring in the desert and found that it hadn't been totally destroyed by the Mexican's highway construction. Several more miles of desert roads found us at the owner's ranch where we obtained permission to visit the pit. He insisted on sending a man on horseback to show us the way to the pit so after fixing Terry's truck we continued onward being directed by the horseman. After crossing several arroyos we arrived at a stock tank and got out to survey the best route up the mountain. Jim Clements amazed us by stepping on a rattlesnake and then leaping three feet into the air. Deciding to head straight for the pit Terry pointed his truck in the general direction and with lecheguilla and cactus flying we bounced up the mountain. After getting organized, people started up the mountain with the 80 lbs. of bluewater II rope. The 15 minute walk to the pit stretched into an hour hike through thick underbrush. The entrance was finally reached and the rigging began, one rope down the one meter in diameter entrance and a second rope down the two meter in diameter opening. The first people into the 436' drop encountered a Gordian knot about 300' down and were forcibly delayed while it was untangled. As the group ascended and descended, they were impressed by the huge cavity below and the tiny entrance high above. The climbing times varied from 15 minutes to an hour and by midnight all had left the pit, leaving derigging for the following morning. After a memorable hike through the cactus and brush in the dark, the group reached the trucks and collapsed. When the sun rose again, a group headed up to derig the pit. Arriving at their destination they discovered Dan Watson had already pulled the ropes and had them nearly ready to be carried down. Tying them to a pack frame, the group was soon off the mountain and ready to head back for the U.S. Terry and Paul decided to drive back through Lampassas and discovered that the road had turned into a sea of mud. Terry managed to four wheel drive through the worst places but Paul's truck died in the middle of a raging river and had to be pushed out by locals. Then he got stuck in a huge mudhole until a passing four wheel drive towed him out. All in all a good time was had by all and the Illusive Pit became more than just a name to 12 cavers who entered its depths.

Notes on Cueva del Porvenir

As reported by Peter Sprouse in the October NSS News the illusive Cueva del Porvenir has finally been found. Several trips had attempted to reach this locally well-known cave 70 Km across the desert SSE from Cuatrocienigas, Coahuila, but were sidetracked or met with various misfortunes. However, with the new topographic maps (Reforma Quadrangle G14A61) and Terry Sayther's speleotruck, we were able to drive almost to the entrance. A group consisting of Terry Sayther, Nancy Sayther, Craig Bittinger, Bill Russell, Logan McNatt, Dennis Breining, John Omnaas, and Anna Vrba mapped Cueva del Porvenir, but only started checking the numerous entrances in the canyon walls. Cueva del Porvenir was found to be as reported, an impressive tunnel seldom less than 30 feet wide and 40 feet high, and for long sections a nearby circular tube 50 feet in diameter. Many domes extend upward beyond the reach of a powerful light. The passage is not well graded, but trends generally upward following the strike SE along the east edge of the Sierra de San Marcos. The cave apparently ends in a series of high domes, similar to Cueva de la Boca.

Sotano Hondo de Pinalito
By Steven Bittinger

In December, 1974, Donna Atkins, Steven Bittinger, and Bill Mayne from Texas first visited Sotano Hondo de Pinalito. The cave is located near km. post 105 on highway 85 north of Jacala, Hidalgo, Mexico. Preliminary reconnaisance reveals a typically vadose multi-drop system as deep as the present limit of exploration at -175 m. Noticeable airflow encourages further efforts at exploration.

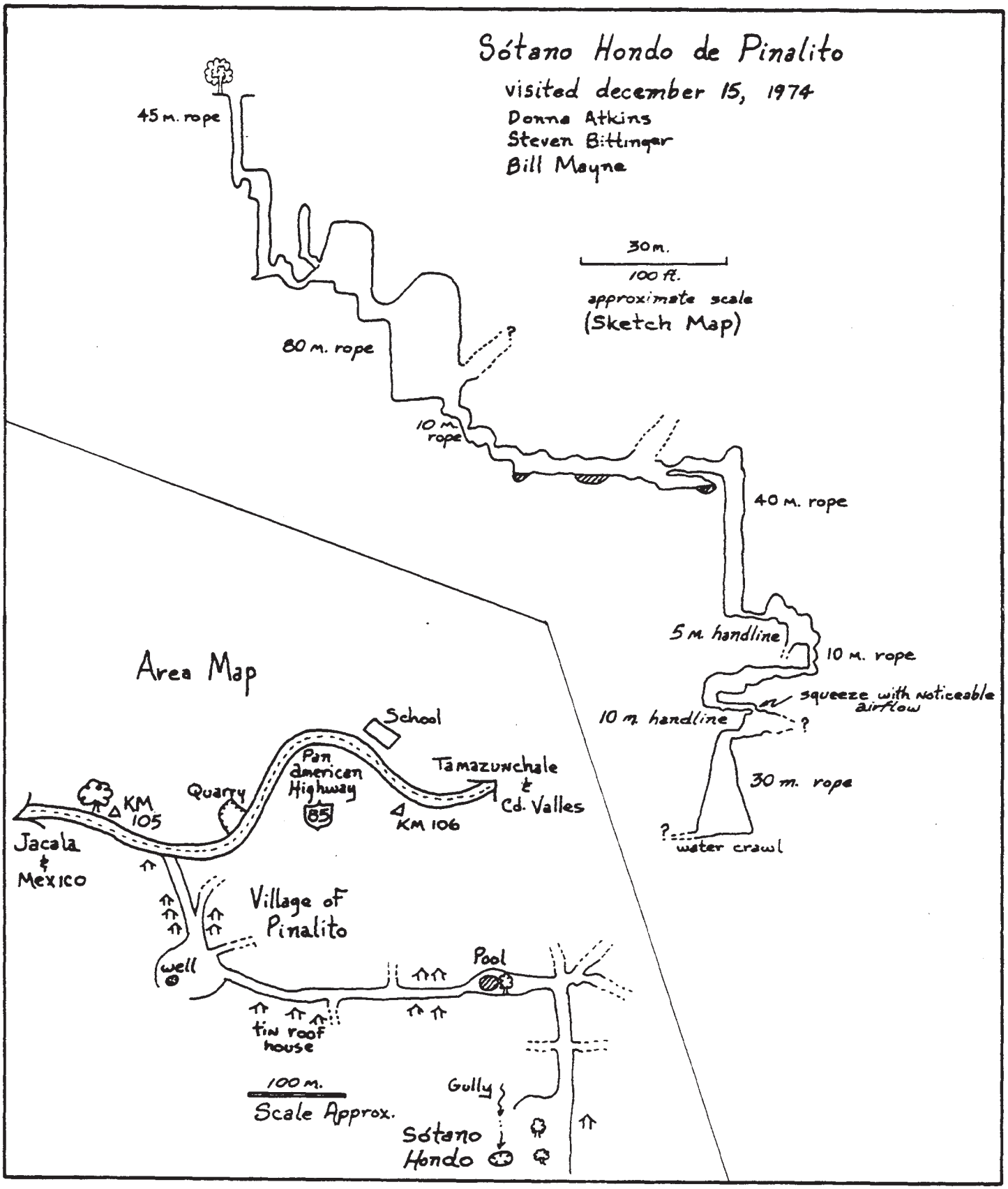
Sotano Hondo (as the cave is known by the inhabitants of the village of Pinalito) lies at the end of a small arroyo in the bottom of a large closed valley where it receives significant runoff. It is possible to drive to within a few meters of where the entrance is hidden in a clump of cedars. Although no other major caves have been explored in the immediate area around Pinalito, the altitude of nearly 2000 m. and widespread internal drainage suggest that extensive systems could be present.

Sotano Hondo is a fun and interesting cave to visit. Few formations are present, but the upper portions of the cave are scoured smooth and clean. The initial drop into the cave is easily rigged from a large tree which shades the entrance. From the bottom of the rope, a low passage dips down, then up to enter the first large room. Here a 3 m. climbdown (aided by a log) is followed by a climb down the left side of a 6 m. drop. A fairly long tie-off to a boulder then allows the immediate descent of a 20 m. drop. This is followed by a slightly overhanging but climbable short drop to the top of another short drop requiring a rappel. The rope can be rigged through a crevice on the right wall. A further short climb brings one to the top of a 3 m. drop into a small lake. This can be rappelled or bypassed by following a ledge along the right wall, then bridging the canyon to chimney down. The horizontal passage soon splits, the right-hand side ending in a sump, while a squeeze straight ahead leads to the top of a 30 m. drop. A rope can be tied off to some holes right on the lip of the pit. After a 5 m. crawl from the bottom of the drop, another climbdown is encountered -- this one requiring a few meters of handline. A steeply sloping squeeze on the right probably extends to the lower level passage which is more easily reached by a short rappel of 6 m. down a shaft on the left. A horizontal canyon leads into an area floored by breakdown where the passage soon doubles back under itself. At this point a tight vertical squeeze makes noticeable a flow of air that had previously been undetected. As an aid to returning back up through the squeeze, a handline is advisable. Doubling back again along the same prominent joint, the passage makes another drop of 25 m. The bottom of this pit was the maximum limit of exploration in December, 1974. From here a water crawl leads off, possibly being the route taken by the airflow. (See map next page)

It seems surprising that a cave so easily reached has not been explored before. Local inhabitants seemed quite friendly and indicated that there were other sotanos in the area which also received surface drainage. Another trip to Pinalito would provide the opportunity to map and explore further in Sotano Hondo and perhaps locate other equally promising caves in the area.

* * * *

From Mike Boon "I'll have a note on Huistan cave names in the next Canadian Caver. Chen-sen-vil-mut is hopelessly wrong. Ch'ensibilmut is correct. Joya Chen or Hoya Chen (you have both on page 9) are both wrong. Joyo'ch'en is correct. Two of the people who surveyed the "sink end of the same system" were <u>not</u> menbers of the Alberta Spelelogical Society and none of these (myself, George Tracy and Tom Miller) who explored and surveyed the main passage(4000 of the 4600") in K'ocho' (upstream from Joyo'ch'en) were A.S.S. members


Sótano Hondo de Pinalito
visited december 15, 1974
Donna Atkins
Steven Bittinger
Bill Mayne
45 m. rope
30m.
100 ft.
approximate scale
(Sketch Map)
80 m. rope
10 m. rope
40 m. rope
5 m. handline
10 m. rope
squeeze with noticeable airflow
10 m. handline
30 m. rope
water crawl
Area Map
School
Pan American Highway
85
Tamazunchale
&
Cd. Valles
KM 105
Quarry
KM 106
Jacala
&
Mexico
Village of Pinalito
well
Pool
tin roof house
100 m.
Scale Approx.
Gully
Sótano Hondo

CAVE MAP SYMBOLS
(continued)

The AMCS will try to keep all members informed on the important discussions now in progress that will lead to adoption by the NSS of an official list of cave map symbols. This list will hopefully standardize cave maps across North America. Your comments are solicited as mistakes made now will be difficult to correct later. The following letter from NSS President Eugene Vehslage to Will White summarizes recent activity by the NSS:

Dear Will:

During the June Board of Governors meetings at the Calaveras County Fairgrounds (alias Frogtown), a motion was considered to designate a set of map symbols submitted by the NSS Delegate to the UIS Commission des Signes Conventionelles (Jim Hedges) as the "NSS Standard Map Symbols 1975". Strong objections were raised to this by several Directors, mostly from Texas. It is my understanding that Bill Russell has a much shorter set of symbols that were published in an AMCS publication (which I received by second or third class mail). The Board voted to refer this matter to an Ad Hoc Committee. I have appointed you as Chairman of this Committee with the following members:

James Hedges, 8218 Sherrill St., Landover, MD 20785
William H. Russell, UT Station Box 7672, Austin, TX 78712
Tom Cravens, Meramec Community College, 11333 Big Bend Blvd., Kirkwood, MO 63122
Ronald G. Fieseler, PO Box 5672, Austin, TX 78763.

By carbon copy I am asking Messrs. Hedges and Russell to send copies of their respective lists of symbols to each of the committee members who might not have them, along with explanations as to what is better about their list, and, more important, what sort of compromise, if any, they see in making an official list of standard map symbols. I feel that it is the Board's wish (and certainly mine) that some sort of consensus can be arrived at before too long.

You are not constrained to limit your considerations to the two map symbol lists mentioned above, nor are you limited to consulting the named members of your committee. Please call on anyone and everyone that might make your final recommendations of the greatest value to speleology, in the broadest sense.

There will be a Board of Governors meeting on 11 October in Albuquerque and I plan to list a report from your committee on the Agenda. In the meantime, please keep me informed of how you are making out.

Good caving,

Eugene Vehslage
President

At present it looks like the committee will adopt two lists, a short list that can be widely distributed and printed in any book containing cave maps, and a longer list containing many less frequently used symbols for special purpose maps. Both lists will need to be compatible, and use the same symbols for equivalent features. At present the long Hedges list is not compatible with the AMCS short list, the main difference being water and domes. There are many compromises available on the symbols for domes, and water appears to be the real problem. Hedges seems to feel that ruled lines are not "natural" and should not be used for a natural feature. The AMCS mappers feel that water is an especially important feature and needs a unique, easily recognized symbol. The AMCS list presented here for adoption by the NSS is the same list presented in the last issue of the Activities Letter except that water depth is given by a number in a square, rather than using the combined water depth-ceiling height symbol given in the previous list. The AMCS list is presented here in a one page format. The 32 symbols on this list can be effectively portrayed on a single 8 X 11 page, and includes all symbols in common use, as well as the geologic symbols. The AMCS feels it is important to include geologic symbols on all symbol lists to break the ignorance cycle. Cavers never see them so they don't use them. Geologic symbols should be used on most cave maps. The statement that the NSS or AMCS adopt the USGS symbols is of little help. The AMCS 36 symbol list should be adopted by the NSS and widely distributed. This should be as soon as possible as new lists of "standard" map symbols are proliferating rapidly.

Vehslage, White, Russell, Cravens, Fieseler
About the map symbols committee:

5 August 1975
8218 Sherrill
Landover, Md.
20785

As best I recall, Vehslage, White, and Russell already have received copies of both the symbols which I proposed and the accompanying manuscript. If not, or if you've mislaid your copies, please request new ones.

Cravens and Fieseler are receiving copies of the map symbols with this letter; copies of the manuscript will follow in about two weeks, after I can arrange to have it duplicated.

DUE TO THE DIFFERENT TIMES AT WHICH EACH OF YOUR COPIES HAS BEEN MADE, there will be minor differences both in the symbols and in the text. A few changes have been made due to recent information from the British Cave Research Association, others have been made on the request of Russell, one on the suggestion of Franco Urbani P., another because I think somebody was pulling my leg and I didn't realize it.

Making five identical sets of the thing would cost me about $30 and I don't have the money. If you can't make do, then I suggest we wait until sometime next winter, when the Sociedad Venezolano de Espeleología publishes the whole thing and reprints will become available (in Spanish, of course) (Franco Urbani P. has made a beautiful translation of the manuscript !)

My position is fully stated in the manuscript. Hence, I won't address any specific subjects here, but will await questions from the rest of you.

The one serious conflict between AMCS and my compilation is in showing water. It is necessary to be able to map bed materials, bed contours, high and low stages, and other things simultaneously with "water" -- in a single color. My use of waterlines, drawn with a flexible pen, is easier and clearer than is AMCS' use of

mechanical shading -- the dots, contours, speleothem symbols, and what not stand out better among waterlines than within a uniform shading. If we are to use shading for water (and very few North American cartographers do so, I might point out), then many of the other symbols on my list will have to be jiggered, also.

The matter of length can be handled easily by having a "basic" list of a dozen or 15 symbols (less than AMCS) and a "comprehensive" list (which could be even longer than mine). Both would be "NSS Standard Map Symbols", each complementing the other.

Speleologically,

Jim

Russell, Vehslage, Martin

On map symbols

3 June 1975
8218 Sherrill
Landover, Md.
20785

What is "wrong" with the existing set of NSS symbols is that there aren't enough of them, primarily. There also are some inconsistencies, and they might be edged a bit closer to the UIS standard list, but mainly there aren't enough. This is argued, beginning on p. 20 of the ms which I'm loaning to Russell. He is to forward this to you at the Convention as soon as he has read it (copy anything you like, first). It has 39 pages, which is more than either I or the NSS ought to afford to print up and send to the BOG plus mailing list. As I said, it's being published in Venezuela and should be available (in Spanish) before the end of the year.

If the consensus is that the 1961 list has "enough" symbols, then my paper is an interesting but impractical exercise and should be turned down.

Please note, Bill, that this is not "my" list, in 1961, it is Will White's, et al list; also, it was never adopted as the NSS standard list -- it was only proposed to the BOG and then forgotten. The NSS has no formally approved list of symbols.

A copy of the list of symbols will be mailed to Martin, care of etc, by Friday, if not sooner. He isn't getting a manuscript, because I have only one copy to circulate and I don't want it getting lost in the mail for half the summer. Covering letter will be included, though.

What is "better" about the set I'm proposing is throughly defended in the manuscript which Bill is to send Vehslage, c/o NSS Convention after Bill reads it. It's much more comprehensive, it's rationalized, and it's nearer to UIS practice in most respects.

Comments on Russell's critique of my preliminary list (substantially different from the version distributed to the BOG and to Martin):

The "committee" is not yet in existence; I've suggested to Vehslage that

the Crowthers, for instance, be asked to round up a review committee. The list I'm proposing is my own work, although it was compiled from many sources and with a great deal of assistance.

You will recall that the research was done about 5 years ago, so some people currently active as cave cartographers, such as John Corcoran, were not included because they hadn't become prominant. You will note in the "Acknowledgements" the following western cavers: Ray de Saussure, Bill Halliday Carl Kunath (one of the very best), Jim Quinlan, yourself (Russell), Dick Schreiber,A. Richard Smith. Terry Raines was contacted but characteristically failed to reply. I admire Raines' work, but he has never been very communicative.

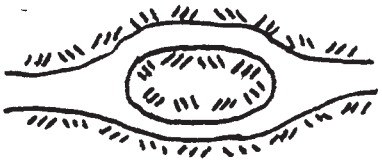
There's no argument, to my knowledge, that there should be a condensed, "basic" list and an exhaustive "supplemental" list. I would suggest the following for the basic list:

horizontal entrance	passage height (air-filled)	block breakdown
passage	stalagmites present	pit
cross section	stalactites present	dome
underlying passage	columns present	small stream
unsurveyed (unexplored) passage	rimstone dams	large stream
slope	flowstone on floor	lake
vertical drop		

This is a total of 18; more or less could be included. I'm not too concerned to argue over what would be appropriate, but 15 or 20 symbols should be the limit.

It is simply impossible not to have conflicts with other lists. I mean, you physically cannot come up with a list which does not have a few conflicts with "symbols commonly in use elsewhere to show a different feature." I've tried not to propose changing any symbol in common use in the US -- which is why I'm not entirely congruent with the UIS list of symbols, but there's no use trying to avoid conflicts with all other USA lists, not to mention avoiding international conflicts.

It would be a good idea to change my pillar symbol, yes. How about this type of hatching, it's often used overseas to indicate the bedrock wall of the cave:



Both the basic and the supplemental lists should be adopted as the NSS standard. Otherwise, we're right back to having no standardization. That's what we're trying to establish in the first place.

The only outright conflicts between AMCS and myself are:

massive flowstone -- I define this as "column"
stalactites -- I use the USGS symbol for chert
stalagmites -- do
bedrock floor -- AMCS resembles my "boxwork" symbol

When you say, "talus", I think you mean slab or chip breakdown. Talus is a

morphogenetic feature involving gravity erosion. Lots of chip breakdown lies where it fell, with no talus morphology.

I'm also making a deliberate issue of "siphon", because there is hardly ever a physical siphoning effect at these places. They are just low areas, traps, where water collects and fills the passage up to the ceiling. A true siphon, you will recall, consists of two reservoirs connected by a higher (but air-tight) channel containing moving water under a vacuum.

I'm not especially opposed to an "upper level" symbol, but the definition should make it clear that this is an uppermost level where two other, lower levels, also are present. It's not too logical to have an implied main level, and a lower level, and an upper level, when there never are more than two passages involved. That is, people start thinking of geomorphic levels and terrace levels and older and younger levels and pretty soon the map is full of implied cave history instead of being purely descriptive.

Your water depth symbol comes from some other standard source, I know. Mine, from Audétat, is less likely to be confused with numbers standing for other things.

I know of no other stateside cave map symbols list which uses ruled lines for water. This is common overseas, but essentially never in the US. I don't think you could make it stick, even if it were adopted -- which is why I'm not trying, even though the UIS calls for ruled lines. If I should agree to change this, then I'd have to rework several of my other water-related symbols. It's not worth it. See p. 16 et seq in the ms for a full defense.

Your "massive flowstone" is the same as Vineyard's "column", which is the one I'm using in preference to the older list. It's not that much of a difference that people would be confused, but it's not quite the same.

There's no difference between your "flowstone column" and an ink spot, which is why I'm not using individual dots for anything in my list. An ink spot always has to be associated with an obviously intentional marking on the paper, otherwise it will be ambiguous.

Your"dome" symbol could be reconciled with my "ceiling ledge" simply by adding dots between the dashes. Even so, there is no way, in your system, to represent domepits -- features with both height and depth in relation to the reference level (an intersecting passage). I guess I was thinking "vertical shaft", and it wouldn't be too good an idea to leave genetic cave interpretation up to week-end cave surveyors. Can you modify yours to include alternatively pits and/or domes or both in the same scheme of symbol?

I agree that, ideally, bedrock floor should be mapped, not assumed. On the other hand, if bedrock floor is mapped over a large area, the symbol will cause problems with mapping anything else. Try mapping a bedrock stream channel containing breakdown, for example. It will become extremely cluttered, especially after reduction. If there are speleothems on the ceiling above, it will become incomprehensible and require two or more maps, each showing one class of cave feature -- speleothems, water, floor materials. This is why I said "assumed" if not mapped. I won't argue over it, though, if you want to drop the "assumed" part.

Boxwork is so rare that there probably would be no harm in retaining your symbol. Few opportunities for conflict. One other criticism is that you cannot map the true areal extent of a bedrock floor as I can, because your symbol consists of disconnected segments whereas mine is continuous.

I'll go along with your "human debris" -- my cave area has many more arrowheads than pots, so I naturally drew an arrowhead.

You have no outright conflicts with UIS except your "column", which they use for "stalagmite."

Let me object that AMCS has too many symbols for a basic list, also: Leave out the "geology" -- most cave mappers aren't going to recognize faults or be able to measure strike and dip.

Depth and height below entrance are meaningless unless there is an accurate profile survey -- rarely the case.

Profile trace clutters and, besides, very few profiles are ever published.

Sump is rarely used.

All floor symbols except breakdown are rarely used. Usually, only geologists are going to map floor sediments. Spelunkers map breakdown because it gets in their way, but they don't worry about anything else.

Moving on to the text of your article:

Many of your comments are addressed in the manuscript; I'll reserve arguments until you've had time to read it.

The basic list should have an upper limit of 20 symbols, at most. AMCS is too long -- and I'm not saying this just to be aggravating.

Numbers are essential -- the depth of a pit, for example. You want to know how much rope you need, don't you?

In the revised list, the height of a dome is in a dotted circle, not a circule with a line under the number. That's a little less complicated.

The purpose of having different geometric shapes associated with numbers standing for different features is to prevent confusion. If the numbers stand alone, more or less beside their feature, when there are several numbered features, one is not quite sure which goes with which. Also, it is much faster to recognize shapes than it is to cognitively read and understand letters and numbers. The reader can pick out a number in a square as belonging to the pit much faster than he can read the number and decide that it probably applies to the pit.

I used my "dome" sign because it already is in wide use. However, yours will be more logical, if you can adapt it to domepits.

I kept "natural bridge" because many people use something similar. It is quite true that there need be no formal symbol, that coincident upper and lower levels with a ledge symbol at each end of the lower level symbol means the same thing. But there should be a defined example of this, otherwise many people will think that we forgot about it.

The flowstone symbol is widely used -- you mean, connect the squiggles?

The wall line is broken at "flowstone wall" because we don't know where the bedrock wall is located -- we should only map what we can measure and "know" with some degree of certainty.

The crossed pick-and-shovel is used on small scale maps; on large scale maps, the outline of the diggings can be mapped with the "artificial floor ledge" symbol. Another example -- where the limits of the workings are not known, as in many saltpetre mines, only a generalized symbol is appropriate.

I'm trying to get us into agreement with the USGS and other conventional geological maps -- hence the triangles for chert. Unless the draughtsman is extremely careful, triangles get out of alignment and their meaning (whether stalactite or stalagmite) becomes doubtful. I'm trying to eliminate as many of these open-to-question symbols as I can.

There's no mention of units on the list of symbols; in the manuscript, the section on the title block provides that the type of units shall be stated in the title block. Presumably, if the bar scale is in chains and furlongs, then the whole map is in chains and furlongs.

As I already said, you can't avoid numbers on the plan map because very few mappers provide profiles and cross-sections. Even a profile doesn't show ceiling

height variation, say across the width of a large room. You can either provide an inset map with ceiling contours, or you can provide numbers.

My "bedrock floor" symbol is from Vineyard.

In summary: I like several of your suggestions, and I have a few for you which shouldn't do too much violence to the AMCS system. Please consider my arguments where I still disagree and fire off another round of discussion.

My cover letter to the BOG, which went out last week with copies of my revised map list (the one I sent to you this year) states that AMCS is going to propose their list as a substitute "NSS Standard." If you're not there, I hope you can arrange for someone to provide copies to the BOG before the meeting is over, so that the AMCS list can be considered, or sent to committee, or whatever is done about this next time around.

Speleologically,

Jim

Comments on Hedges' Letter

By Bill Russell

The detailed comments were especially welcome and from communications a better list should develop. I like the new pillar representation -- in most maps where floor detail is shown it is not necessary to show the walls as the "cave" is full of symbols and stands out well, but where it is necessary to show pillars the new symbol is good. The upper level and lower level symbols actually are used only where passages cross and do not imply a "level" but only a crossing above or below. The wording on the new list has been changed so as to make this more obvious. In complex vertical caves with several superimposed levels the plan view of the entire cave frequently can give only the horizontal extent of the cave, with most of the detail given in profiles, insets, and cross sections. The objection that the AMCS symbol for flowstone resembles an inkblot does not seem valid as unwanted ink blots are rare and easily removed. The AMCS list uses a solid hatchured line for pits below the floor level and broken hatchured lines for domes, and combinations of these for a dome pit. Several years ago the AMCS decided to use broken hatchures for ceiling features and the first used a dot between the hatchures, but these were hard to draw and were omitted. Hedges should be aware that most cavers use "syphon" to mean a passage full of water, whether or not any syphoning action takes place. The AMCS list follows this common usage. Geology symbols should be included on the basic list; any surveyor who is able to map a cave can measure strike and dip. A dome pit is a distinctive feature that cuts through preexisting cave levels and perhaps a unique symbol should be provided for this, as for example,  , but many compromises are possible. Water seems to be the main problem, and a discussion of water symbols follows excerpts from Hedges' article on cave maps.

Excerpts from: "What Ought a Cave Map to Show" by James Hedges

The following are excerpts from a longer article by James Hedges on cave maps. The parts of the article presented here are those sections dealing directly with map symbols.

ABSTRACT

Cave maps must serve a varied audience. While Level 2 maps (accurate Outline Surveys) satisfy the need for route guides during exploration, they contain so little detail as to be of little reference value to persons not already familiar with the caves shown. Level 3 maps, showing passage topography in addition to passage outline, are scarcely more useful. Modest additional effort on the parts of survey teams and of cartographers would clothe passage outlines and slopes with geographic, geologic, biologic, and cultural data basic to the work of many specialists.

Until cave surveyors, draughtsmen, and cartographers are possessed of a larger vocabulary of map symbols, they will be unable to conceptualize and to execute highly informative maps. Most of the phenomena basic to modern speleology have been adequately symbolized at one time or another. In this compendium, the most pictorial of these symbols have been rationalized and made stylistically compatible. Those previously advocated by the Union International de Spéléologie and by the National Speleological Society (United States) are largely preserved.

Speleo-cartographers face three major technical challenges: (1) to devise a means of presenting highly informative maps of large caves at small scales, (2) to devise an inexpensive method of rendering maps of multi-level caves, and (3) to devise more-easily understood maps of caves having great relief.

Even the most detailed cave map will not be an effective vehicle of communication if it be cluttered, cramped, lettered poorly, or in other ways offensive to the eye. Cave cartographers should strive to produce maps which convey information in a graceful manner.

PREFACE

Cave maps are the basic documents of speleology. An adequate map shows not only the widths and trends of the passages. It contains, also, the location of the cave, directions for reaching it, a geological summary, an outline of hydrology and meteorology, data on biota and their ecology, notes on history, suggestions on scenic values, and comments on the accessibility of the various passages. The map should be a concise, encyclopaedic summary of the cave.

Permanently recorded observations, such as printed maps, must be communicated through time as well as across space. Effective communication depends upon the existence of symbols the definitions of which are uniform throughout the world and unchanging through time. Neologisms should be introduced only when needed to express new concepts or to record new percepts; in no case, should new symbols conflict with those previously adopted. Individuality is preferred in layout, draughting, and lettering, but cannot be allowed in symbolism.

Most organizations which publish cave maps have issued lists of standardized map symbols for use by their member cartographers. The National Speleological Society (United States) is not among these, although a committee chaired by William B. White proposed a list of symbols in 1961. At Dr. White's request, I have revised

that list to include a broader selection of symbols and to make the symbols recommended more nearly compatible with those of the Union International de Spéléologie.

Surveying and draughting techniques have been discussed many times. It is not my purpose to review what is (or ought to be) matters of general knowledge. Nor am I concerned with the making of special-purpose maps. Rather, I would like to deliver myself of a few thoughts upon basic cave cartography, upon the most informative, legible, and attractive means by which the survey data may be permanently recorded. That is to say, I would like to discuss the geographic cave map.

Most of the draughting suggestions given can be adapted to mechanical drawing methods. All symbols remain clear and unambiguous, regardless of the materials and techniques used. However, all serious cave map cartographers should consider that pen-and-ink methods, once learned, are the cheapest, quickest, and most versatile of all. Avoided is the expense of elaborate draughting equipment, gone the stylistic restrictions of lettering guides, no more the incompatibility of size between commercially prepared adjesive transfers and the scale of the cave being represented. The ideal of a unitary, synthetic cave map, in which all lettering and symbolic elements are complementary in scale and style to the perceived character of the cave, can be achieved only by free-hand methods.

COMPARISON WITH OTHER STANDARDS

With the few exceptions discussed below, all symbols proposed in the preceeding section of this report are either identical with the symbols recommended by the UIS, are obviously similar to them, or represent features not symbolized by the UIS. They were drawn from several sources (see: "Literature Cited" and "Supplementary Readings"), but primarily from the "Proposed Standard Map Symbols (1961)" of the National Speleological Society (United States) and from the list of symbols adopted by the Union Internationale de Spéléologie in 1965 and published in 1966 by Trimmel and Audétat.

Some of the proposed symbols are different from those defined as representing certain features by the NSS, the UIS, or both. A few of the definitions set forth by the NSS were illogical or referred to non-existent features. These have been omitted, entirely.

The major difference between this compilation and the UIS list is in the problem of symbolizing water. European practice has favored hatched shading, while most North American cartographers have favored waterlines, dots, or other methods. An underlying principle guiding the selection of symbols adopted in this report was that only man-made features should be represented by rigidly geometric patterns. Natural features should always be drawn free-hand, for the sake of plasticity (after all, nature rarely is precisely geometrical). Thus, water, a natural feature, should be represented by a free-hand figure. Another, practical, reason for selecting waterlines was that dots and straight lines would conflict with symbols representing clay, sand, and other bed materials, and with depth contours. Waterlining with a flexible pen permits the superposition, in one color, of water, bed materials and (drawn with a fine tube pen) depth contour symbols on the same map.

PROBLEMS OF REPRESENTATION

Too-Few Symbols

The main deficiency in the Proposed Standard Map Symbols (1961) of the National Speleological Society and in most other lists of cave map symbols is

their limited scope. There are too few symbols included to enable a cartographer to portray all of the cavern features which are of potential interest to map users. This leads either (a) to the repeated invention of special symbols (which defeats the purpose of having a standard list), or more often, (b) to the omission of data.

Surveyors may neglect to record certain features because they are unaware that anyone might be interested in something for which no symbol exists. Should such a feature be recorded by the survey team, the draughtsman may fail to include it on the map out of ignorance of a means of portraying it. An expanded list of standard map symbols will help to educate map makers in the kinds of information which are desired by map users and will enable them to present these data more effectively.

Too-Many Symbols

Many map users, and some leading cartographers, suggest that a comprehensive list of map symbols would be so complex as to be more confusing than helpful to the average caver. In truth, the preparation of Level 3 maps requires the use only of about 15 symbols, all of which are in common usage and rather self-evident in meaning. That an unabridged dictionary of the English language contains some 500,000 entries has not discouraged most of us from learning and using 1/100 th that number of words in every-day speech. At the same time, few of us could communicate accurately were we always restricted to a basic vocabulary of 5000 words.

Too-Intricate Symbols

Of a piece with the objection about excessive numbers is the complaint that some symbols require more drawing ability than is possessed by the average cave cartographer. In fact, each symbol proposed in this report is sufficiently unique that it remains clear and unambiguous, even when scrawled with a dull pencil upon a muddy field notebook. Skill and artistry have very much to do with the attractiveness of the finished map; they have extremely little influence upon its information content.

Comments on Hedges' Article

Bill Russell

It is unfortunate there is no organization eager to print Hedges' article on cave mapping -- perhaps the NSS geography and geology section could begin a discussion of cave maps and map symbols. Space in the Activities Letter prohibits printing the full text of the article and Hedges' complete list so those interested in the forthcoming selection of a standard list by the NSS will have for the most part to rely on Hedges' comments. Though most of Hedges' symbols will undoubtedly be adopted, there are so many that even if it were desirable they could not all be carefully considered, and many of his symbols are in agreement with established practice and are probably the best that can be devised.

However, in one important respect he does not follow the UIS or the AMCS list. This is in his treatment of water. Hedges feels that "only man-made features should

be represented by rigidly geometric patterns. Natural features should always be drawn free-hand, for the sake of plasticity (after all, nature rarely is precisely geometrical)." This need for "plasticity" would seem to be purely an aesthetic convention of Hedges'. The symbol that best portrays a feature should be used whether plastic or not. And in any case, the use of parallel lines to represent the surface of a cave pool, which is much more "precisely geometrical" than most man-made surfaces, would not appear to violate Hedges' convention. The edge of the pool is drawn freehand in both systems. It does not seem desirable to show both water and the deposits under the water. If both are to be shown, either the bed deposits should be shown on an inset, or the water should be printed in blue. And I cannot resist one last comment on style -- To me freehand lettering detracts greatly from the finished maps, calling attention to the calligraphy rather than the cartography and as commercial lettering guides and adhesive transfers are available in all useful sizes, a resourceful mapper should not be forced to use hand lettering.

A number of letters on map symbols have been received from cavers who are not members of the map symbols committee. All suggestions are welcome and now is the time to let members of the committee know how you feal as once a standerd list has been adopted it will be more difficult to change a symbol. I will try to comment on the letters received in the next AMCS Activies Letter, but I can answer one question posed by the carefull map reader Bob Thrun.

Speaking of symbols, what is the funny symbol on the Ventana Jabali map?

These are large tripods used to support a guano mining cableway.

* * * * *

The following letter from Tom Cravens indicates his feeling that the work of the committee is to reconsile differences between existing lists rather than to develop the best possible list. Unfortunately the very number of lists and symbols makes even this task difficult

Dr. William B. White
210 Materials Research Bldg.
Pennsylvania State University
University Park, PA 16802

Tom Cravens
Dept. of Sociology
Meramec Community College
11333 Big Bend Blvd.
Kirkwood, Missouri 63122
September 26, 1975

Dear Will,

I am writing to you regarding the Ad Hoc Committee on Cave Map Symbols. Let me begin by saying that I feel seriously limited with regards to my input to this Committee due to a lack of background material. As you may be aware, I was unable to attend the convention and thus missed the reportedly stimulating debate which lead to the creation of this Committee. I did receive some materials from Jim Hedges, plus an accompanying letter (August 22, 1975) in which I was asked to respond to three questions. Due to the short period of time involved, I have been unable to seek as many opinions and suggestions from knowledgeable cave mappers in the Midwest as I would have wished. I have, however, had an opportunity to obtain considerable input from Jerry Vineyard and much of the specific recommendations regarding choice of cave symbols were provided by Jerry.

In response to the questions posed in Hedges' letter of August 22:

(1.) I favor a basic list of symbols which could be used in most situations. Additionally, a supplementary list containing symbols which would be used only in special maps or in atypical situations. It sort of appears that there are just too many symbols floating around for them to be effectively used as standard symbols.

(2.) I am in favor of developing the basic list by drawing from both the Hedges' list and AMCS's list. I really don't see that it is a question of building on one list as opposed to the other, but rather selecting the most appropriate symbols from both lists.

(3.) I am returning with this letter all the symbols from both lists which were sent to me by Hedges. (Due to cost of Xeroxing, this material is not being forwarded to all Committee members.) I have indicated in the margins those symbols which should be part of a basic list and those which I feel would best be included in a supplementary listing. Symbols without marks were deemed inappropriate for inclusion in either list.

In addition to responding to Hedges' questions, I should like to add that I do not think that a finalized set of symbols can be very effectively developed through a committee structured such as this. I assume that we are simply functioning to more or less mediate a dispute rather than put forth a finalized "masterpiece".

In closing, if you are in need of additional comment, please do not hesitate to contact me.

Tom Cravens

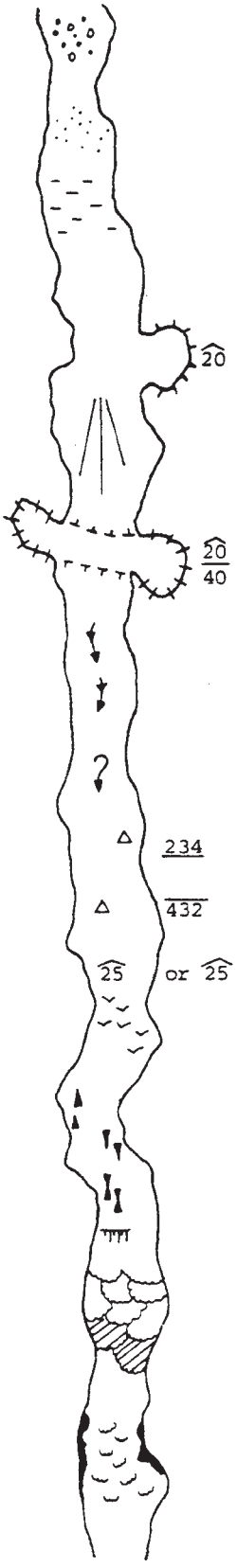
STANDARD LEGEND FOR CANADIAN CAVER MAPS

In order to save time and effort in drafting cave maps I am proposing a standard set of cave symbols to be used on maps published in The Canadian Caver. Starting with this issue maps will be published without a legend, unless special symbols are used. A list of recommended symbols is given below and will be published (in a condensed form) in each issue of The Canadian Caver. Unfortunately, there is no standard set of symbols in general use in North America so I have chosen a mixture of those used by the C.R.G., the A.M.C.S. and the N.S.S. (as recommended by James Hedges). Hopefully everyone will get together to produce an acceptable list of cave symbols eventually.

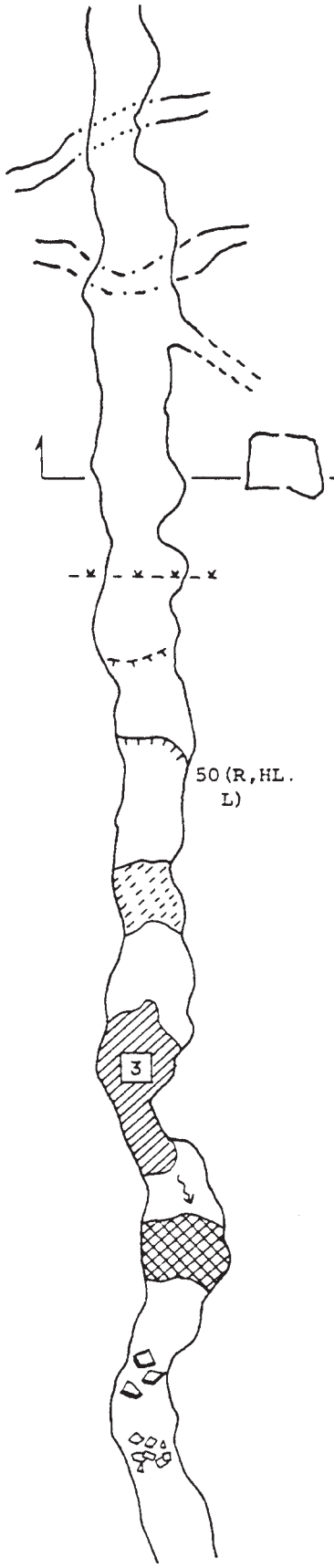
What must appear on every map is the name of the cave and at least the province or state it is located in, a scale both in metres and feet, north arrow, the map units (ie. feet or metres), survey instruments used (preferably with some indication of the accuracy of the readings) and the names of the surveyors. It is also usual to give the total surveyed length and depth of the cave. Other notes may be made at the discretion of the draftsman. Those familar with the CRG system of grading may wish to use it. A good indicator or the accuracy of a survey is the closure error on loops, and this should be quoted when possible.

Peter Thompson

Canadian map symbols continued next page



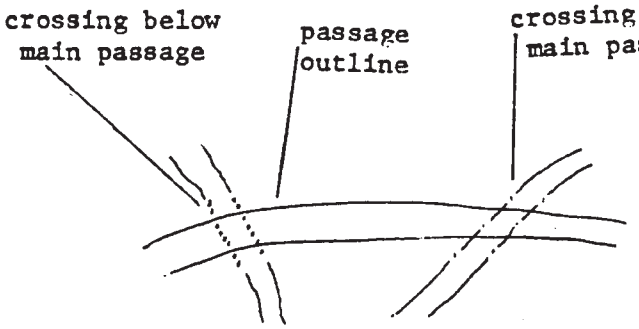
FEATURE	NOTES
Gravel	Can be mixed
Sand	
Clay or silt	
20 Dome with height	
Slope (down in splayed direction)	Can be shown with slope (in degrees) if measured.
20/40 Domepit with height and depth	
Air current	Note on map if cave breathes or if air current direction changes seasonally.
Scallop or current-marking direction	In a dry passage inferred from scallop morphology.
234 Height above datum	Position of survey station should be shown
432 Depth below datum	
25 or 25 Passage height	Maximum height
Guano	
Stalagmites	
Stalactites	
Columns	
Soda straws	
Rimstone (gours)	Active i.e. water-filled gours should show cross hatching.
Flowstone on walls and floor	



FEATURE	NOTES
Underlying passage	If more than two passages are superimposed, the plan of the third (etc) passage should be offset for clarity.
Overlying passage	
Unsurveyed passage	Some indication should be given as to whether or not the passage ends.
Cross-section	Direction of view shown by arrow. All x-sections should be drawn horizontally.
Limit of penetration of daylight	Under the most favourable conditions.
Drop in ceiling height (down in hatched dir^{n}.)	
Abrupt drop with distance (down in hatched direction	Distance must be in same units as specified on map. R=rope HL=handline L=ladder
Ice	Applied to perennial ice only.
Pool with depth	This is used to indicate both standing water and a pool in a streamway. [?] = pool >6 ft deep.
Stream	
Siphon (or sump)	Under "normal" conditions.
Large breakdown	
Small breakdown	

MAP SYMBOLS

Passages



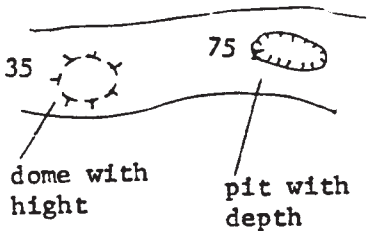
(25) ceiling hight

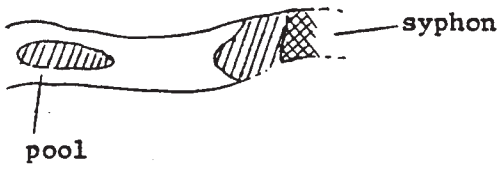
[6] water depth

25 (underline) depth below datum

75 (underline) depth above datum

slope - down in direction of splay





Geology

strike and dip

vertical joint

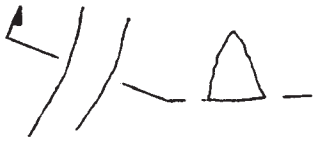
dipping joint

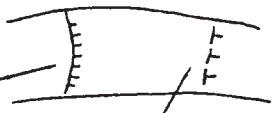
vertical fault

△ survey station

pottery and archological remains

cross section viewed in direction of half barbed arrow





sharp drop in floor down in hatchard direction

sharp change in ceiling hight - low side hatchard

Floor Deposits

clay sand gravel rocks individual boulder guano bed rock

Spelothems

stlactite stlagmite column mass of flowstone soda straws flowstone on floor

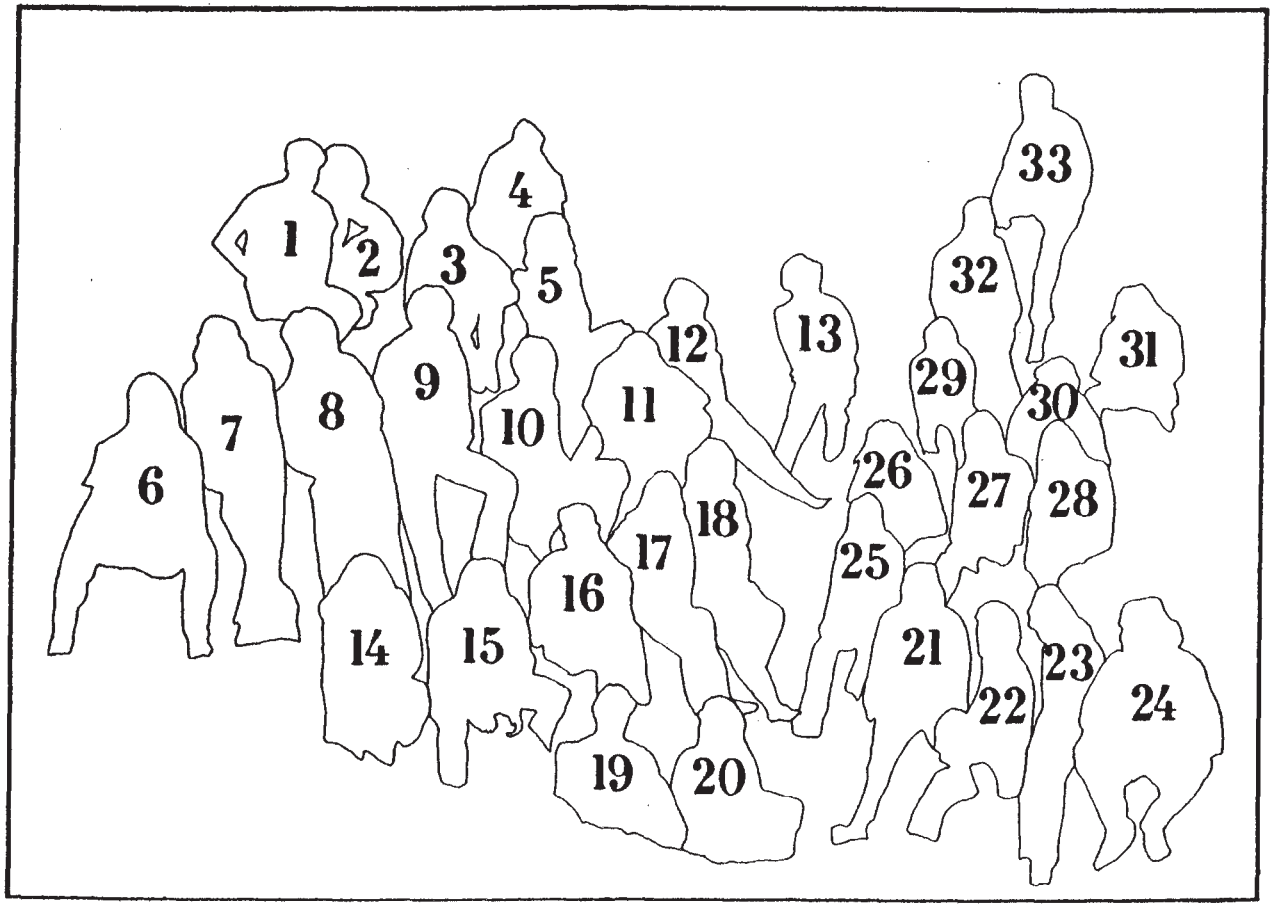
Members of the Conchas Expedition sit around the entrance pit on the last day.

1. Marion Smith
2. Bill Steele
3. Ron Ralph
4. Robert Hemperly
5. Pam Lynn
6. Roy Jameson
7. Thomas Moore
8. Gill Ediger
9. Steve Ward
10. Bill Stone
11. Mark Stock
12. Steve Zeman
13. Logan McNatt
14. Mike McKee
15. Jim Smith
16. Paul Fambro
17. Blake Harrison
18. Jill Dorman
19. Andy Eavis
20. Pete Strickland
21. Henry Schneiker
22. Don Broussard
23. Shari Larason
24. Robert West
25. Alexia Cochrane
26. Andy Grubbs
27. Peter Sprause
28. Maureen Cavanaugh
29. Terri Treacy
30. Terry Sayther
31. Tracy Johnson
32. John Strickland
33. Walt Peters

Arrived to late

for photo:

Kevin McGill
Barb Ransom
Eric Valainis
Donald Spear



AMCS ACTIVITIES LETTER

Edited by Bill Russell

Typing and Editorial Assistance by

Pat Asnes

Spring 1976 | Letter No. 4, May 1976

This forth issue of the Activities Letter is less timely, but we feel that it is more informative than previous issues. Peter Sprause's column in the NSS News has kept AMCS members informed of current activity in Mexico and thus relieved the Activities Letter of some of the necessity of publishing after each major trip. This issue of the Activieies Letter is an atempt to meet the need for a place to publish maps and longer articles on Mexican caves. The NSS News cannot publish accounts of every trip to Mexico, and regional and grotto publications will not reach the widely dispersed membership of the AMCS. It is advantageous for the AMCS to use the NSS News for current information as this exposes many serious cavers to the potential of Mexico. The AMCS does not have the concentrated manpower to maintain a monthly publication. The Activities Letter was begun to bring timely information to AMCS members and maintain the idenity of the Association for Mexican Cave Studies as it was felt that the AMCS would not continue to function without an active publication. The need for information has shifted from timely reporting to longer articles and maps; but we will still publish issues on recent developments when necessary.

$$$

*** RESUBSCRIBE ***

It's dollar time again -- with this issue the AMCS Activities Letter completes its first year. When the Activities Letter was first started, it was felt it would be only a few pages, mostly news of current events, but it has become longer and more expensive. However, we will hold the subscription to one dollar although at this rate we cannot guarantee a full year. When the money runs out we will ask everyone to resubscribe. This will keep membership lists current and if people have to send in money they can also send in articles and information with their money. So send your dollar -- it will be well spent -- and when it is gone we will ask for more. Due to high postal rates we cannot continue to send Activities Letters unless you resubscribe. If you have resubscribed prior to this notice, please let us know, as record keeping is sometimes informal.

Bill Russell

Autopsy of the Gibbs Ascender by A. Grignard
Casually translated by the staff of the AMCS Activities Letter from Speleologia Belgica, No. 3, 1975.

At the present time the speleological world of Belgian is infatuated by the Gibbs ascender. This is due in my opinion to several factors: in the mind of the public, that which is made in the U.S.A. is necessarily better, more carefully constructed; a clever publicity blow has done the rest. Among 99% of Belgian cavers the choice of these ascenders has not depended on practical observations on the ground but has been influenced in a totally subjective manner.

In fact, what is the Gibbs all about? Is it the solution to our problems? I answer no and I will give my reasons:

This ascender is light and more sturdy than other existing types and apparently well conceived. It is true it will permit extraordinarily fast performances on long lengths of rope rigged away from all walls. Thus in the deep pits of Central America (200, 300, 400 meters even) this equipment is absolutely without equivalent. These grand pits are nothing but holes in the ground in which the entrance is in most cases in the open air and is not followed by any cave system. I admit that this kind of pit is far from abundant on our old continent. Will all the Belgian cavers who bought Gibbs go to Central America?

Let us first look at the classic aspect of big European systems: these are successions of pits separated by horizontal passages, sometimes long, difficult, and/or narrow. In other words caves are complex and acrobatics are sometimes required. These circumstances are often aggravated by the presence of water and always mud which handicaps the equipment.

Having set the scene, let us turn to the ascender itself and to its inconveniences.

1. The method of using the Gibbs to ascend implies bearing them on the legs. Those who climb with jumars will see immediately that the manuvers of unhooking and of re-hooking with Gibbs involve more yoga than speleology.
2. Moreover, the manipulation of Gibbs (rigging and derigging of the ropes) is rendered still more laborious by the fact that it is composed of several indipendent parts. The builder having thought about it and having solidified them by charming little pieces of twine (or flexible metal), I invite you to consider the unhappy user: don't-lose-the-pieces, don't-make-knots with the twine, don't-twist-them-around-the-rope, etc.
3. We will add further the presence of mud, already mentioned as very important in the question of the functioning of these new inventions. One of my friends had a bad experience in the chasm Jean Nouveau (more than 10 pits, -573m). It is a question of G. Badino of Turin who, interested in the method, quickly passed into the camp of the enemy. I myself made many attempts (pit Vincent, -480m, in the Loubens-Henne system). I almost joined the Prussiks!
4. Also, if one uses as usual for ascending a Dressler and a jumar, they can during the trip be used for a multitude of other purposes.

Construction of hoisting-gear: in this area I don't want to do injury to my readers, all experienced cavers, to bring to mind the many and well-tried possibilities of the Dressler. However, in spite of the words of the sellers, the possibilities of the Gibbs are practically nothing (the morphology of the instrument will teach you that).

And safety? Everyone knows the safety of the Dressler. Many use it, some owe it even the pleasure of practicing caving elsewhere than in the local cemetary; in brief, it works! But the Gibbs? These fanatics say: it slides better on the rope than the Dressler. It's true but I find that what isn't said is that it slides in two directions.

5. I personally had the following experience in the R.A.C.: on one ladder I had several falls (voluntary!) depending on the Gibbs: these attempts seemed more like free falls than like any other sport. I was never successful in stopping a fall (not arranged of course). These attempts were displayed before reliable witnesses who were there to care for my multiple contusions.
Conclusions: The Gibbs is incomparable in all great verticals. In Europe one can conceive their use in certain systems: pits of Aphanice (328m), first drops of certain abysses: Pretta (130, 110m), Juhue (302m), Rabannel (130m), etc. The Gibbs is inconvenient and dangerous for all other uses.

Comment

Gibbs ascenders are apparently being used in Europe for pruposes for which they were not designed. Europeans frequently use Jumars as a self-belay on ladder climbs, and assume that Gibbs ascenders can be used in a similar manner. The manufacturers failed to advise users that Gibbs ascenders were not suitable for a self-belay, as few American cavers use ladders for long drops and it apparently did not occur to anyone that a Gibbs would be relied upon to catch an unexpected fall from a ladder. The tests by A. Grignard should inform both American and European cavers that Gibbs are not suitable for use as a self-belay.

* * * * * *

Social Notes From All Over

Austin is the crossroads of speleology. Yesterday at the Kirkwood Caver House Michel Siffre was talking to Barbara McCloud. Michel was on his way from France to cave in Guatemala and Barbara was on her way from Belice to a summer job in Alaska. Barbara told Michel that he should pick up the books he left at her house. Michel said that he would try to come through Belice on his way home. Michel's new book Dans les Abimes de la Terre is worth having just for the pictures even if you can't read French.

Wanted

A house in late August near the University to be filled with cavers or a space in some caver house near the university. I figure I'll try Austin living for a while (like 2 years), beginning September 1.

Bill Stone

Each map of Hoya de las Conchas has a personaly handicrafted north arrow. The north arrow was omitted from the original copy that was sent to the printer so Peter Sprouse drafted an original north arrow on each of 200 copies.

Spring in Chiapas
Persons: Blake Harrison, Jill Dorman, Bill Steel, Cindy Coeburn, Mike Boon, Irv Grahm, Bob West, Gary Napper, and Charlie.

This group left Austin April 5 and arrived at San Cristobal, Chiapas, on April 10. From San Cristobal they headed for the village of Chenalo but took the wrong road in the dark so had to spend an extra night on the road. The next morning they finally arrived and talked to the priest who informed the cavers that the village dumped its sewage into the river that flows into the cave. Despite this information the cavers decided to go ahead with exploration and went down to the cave to watch the sewage-foam flaked water enter the 40 by 80 foot entrance. At the end of the dry season the stream was very low, about 15 feet wide and 2 feet deep. They missed meeting Norm Pace and a car from Canada as the priest told them the others had left. Pete Thompson with Linda Thompson, Christopher Smart, and Ian Drummond drove out to see the cave despite the tales of the priest and met the other group. After a reconnaisance on the first day, the combined group pushed the Chenalo Sumadero to where it sumped in a debri filled lake about 3500 feet into the cave and perhaps 200 feet below the entrance. They had expected Peter Lord to join them, but later learned that while they were in Chenalo Peter was having appendicitis in Oaxaca.

After a day of R&R in San Cristobal the group drove out the new 16Km road over the mountain to Sumadero Yochab. This new road saved them a four hour walk and everyone arrived at the 60 X 80 foot entrance refreshed and ready. They had found Norm Pace in San Cristobal so the group now 13 strong started rigging Sumadero Yochab. The first day 9 people moved 8 duffel bags of equipment and rigged the first 2000 feet to the base camp 450 feet below the entrance. To reach base camp 8 drops had to be rigged including a 60 foot drop into a large lake, and four short ladder drops. Rigging was difficult as ropes and ladders must be carefully arranged to keep the climber away from the force of the falling water. The next five days were spent in exploration -- the push crew of Boon, Thompson, and Smart spent the entire five days underground, resupplied by two surface to camp trips. They were able to push the cave only 300 feet further horizontally and 100 feet deeper as for almost the entire distance it was necessary to place expansion bolts in order to avoid climbing in waterfalls. The rigging was left in the cave after the push trip and the group returned to San Cristobal for a day of rest. At dark they drove back to derig the cave, but next morning Bill Steel and Mike Boon decided to make a final push and spent 21 hours in a last attempt, but they were only able to explore a short distance further. The morning after Bill and Mike returned, Norm Pace, Gary Napper, Blake Harrison, Bob West, Jill Dorman, and Irv Grahm spent 14 hours derigging and carrying out the six duffel bags of equipment. There was a total of eight bags, but two had been removed by the push crew. However, the next day when they started packing they could find only seven duffel bags -- one was missing. The bag contained more equipment than the group could afford to lose -- so they agreed to pay ten dollars per person for three volunteers to return into the cave and retrieve the duffel bag. Bill Steel, Gary Napper, and Jill Dorman

volunteered to rescue the bag. They did not know where the missing bag had been left, so they had to carry enough equipment to reach the base camp. After an easy trip in, the bag was found at the 200 foot level and the three volunteers began the return trip. When they reached the large lake at the bottom of the 60 foot drop the water was muddy and extremely rough. Water had covered the log the belay line was tied to and was apparently rising rapidly. Bill grabbed Jill and told her to get out quick. She jumped into the swift water with her side pack still on her shoulder. The water was deeper than she thought, her light went out, and the pack slipped down over her arms and tangled in the belay line. She gave a cry, but managed to make it across the lake. Bill then came across and tried to rerig the belay line above the lake level and dropped the rope. Jill climbed up and went for help. She reached the entrance to find the surface crew had just weathered a severe storm. Hail stones still covered the mountain but the storm was over and the river was beginning to subside under clearing skies. Boon and Harrison gathered their equipment and went in to assist with the last section. They met Bill and Gary about 400 feet into the cave and stopped on a rock to discuss the situation. As the surface crew was reassuring the recovery crew that the worst was over, the cold water closed over their rock. They were surprised as there was no sign of further rain when they left the entrance a few minutes before. But the water was undoubtedly rising rapidly. The cavers and their three duffel bags were suddenly in a precarious position. The two minute walk to the entrance became an hour's effort against the current. Finally they could not pull the duffel bags against the force of the water even with the rescue pulley, so they tied the bags off and ran for the entrance. The stream had risen almost against the vertical wall, leaving only a narrow path -- until they came to a boulder wedged against the wall. The swift current prevented passage on the stream side, but fortunately, the cavers were able to squeeze through a small hole between the boulder and the wall just before water washed through their escape hole. Upon reaching the entrance they discovered the reason for the sudden rush of cold water -- the hail left by storm had melted producing a flash flood. The next day they returned and retrieved the equipment. The volunteers had earned their ten dollars -- though Jill agreed to take five dollars and a subscription to the Canadian Caver.

Jill Dorman as told
to Bill Russell

P.S. On the first day of rest in San Cristobal they had received a post card from Austin with the news that the landlord was going to evict cavers from the Kirkwood Caver House at the end of the month. So after Yochab they felt it was time to start back to Austin. Bill Stone and Irv Grahm stayed in Chiapas to look for new caves with the aid of advance copies of the new Chiapas topographic maps. The return trip took 49 hours from San Cristobal to Austin where they found the landlord had relented and they could stay.
P.P.S. While Yochab was flooding Mark Shawcross and crew camped at the entrance to Sumadero Chicja were hit by the same storm. Water rose rapidly into the camp and all the equipment could not be gathered in time and a sunto and altimeter were lost. The group also met Eian Finn and crew at Ranco Nuevo where they found that camping was no longer permitted at the cave.

Random Notes on Mexico

Cast of Characters: Bill Stone, Tracey Johnson, Sheila Johnson, Henry Snicker, Julia James, Neal Montgomery, Mark Stock, Jim Smith, Marion Smith, Pat Wiedeman, and Martyn Farr.

On 1000' Pit Leads

Following our Thanksgiving trip stop at the Santa Eulalia Mine, and being convinced that the 1000' pit was actually there, I wrote a letter to the supervisor in Spanish, asking for permission to descend the shaft. No reply arrived and we drove to the mine on Dec. 18. This time we were greeted by all the chief honchos of the mine. They showed us the reply letter, stating that, in essence there were many deep shafts in the mine, but unlike H.A. Walker suggested in the article, there were no tremendously deep natural fissures. After some discussion and scrutiny of the mine's maps, we located what apparently used to be the pit which Walker mentioned. According to Sr. Kirshner, the Gerente de Minas, there previously existed a natural shaft from the 600' level of the mine extending to perhaps the 1000' level where it pinched off. Another similar fissure ran upwards from the 1600' level, but apparently made no connection. At any rate both fissures are now part of the immense Potosi Chimney -- all man made, with approximately 600m of vertical extent and dimensions of something like 150m X 50m wide. According to the mine blue print, if you were to enter the chimney at level 6, a drop of approximately 1150' free can be rigged. Too bad it wasn't natural.

Flying

Of general interest to all, I suppose each of us has always wanted a bird's eye view after crashing through the El Abra for years on end. Well, anyways, Bob Stucklen from Montrose, Colorado, flew in with a Cessina 172 like a dream come true. So on Dec. 23 we flew up the El Abra -- the Monos cornfield is more than 3 times as big as it previously was -- somebody was ambitious! We then flew up the west crest towards Tanchipa looking for holes on Neal Morris' map. Everything checked except for one very conspicuous flaw: we saw a very large black hole, 150' diameter, with undercut walls about 4 miles south of Tanchipa. We have triangulated its location and the closest chop route appears to begin at the end of the Ponciano Arriaga Airstrip. Anyone psyched for another Tanchipa chop? We then flew over Hoya de Zimapan and up to the Estrella Sink. Six passes over Estrella assured an end to the black hole myth. Yes, Bill, Cuesta is right where it is supposed to be! From the first sink south of Estrella we located two pits approximately one mile to the east. We then bombed a straight line of five rolls of toilet paper from the north most pit back to the sink. Continuing north, we located Sotano de Hojas Guandes -- a big pit, but only 200' deep, east of the first big sink south of the Otate mine. Finishing up, we cruised over the mine and then back for more fuel.

The second trip of the day was to be the long one -- scout the El Socavon ridge and the Xilitla plateau. We first flew to Aquismon and then over to Golondrinas. Sotano de la Huasteca was very impressive near La Laja, as was Golondrinas. Flying down the ridge above Drinas to Tamapatz, we saw

one large black hole near the top of the ridge on the side facing Tamapatz. We estimated it to be 100'+ in diameter and a trail passed reasonably close by. Mike Shulte assured me this one is new to him, so there's one good lead. We then hopped the ridge over to the La Parada valley. The El Socavon dolina leaped out as we crested the west side of the valley. This was the ridge we wanted to scout, the first two passes revealed little, the third pass found what we were looking for: a 150' diameter black hole, directly above La Parada. We took bearings on the lake at La Parada and marked this one for a return. Going west we noted nothing large, with the exception of a huge, hear walled dolina north of Tancoyol and at the bottom was a cornfield! We buzzed El Sotano as Marion Smith's crew hiked up from El Carro and headed for Xilitla. The high plateau is higher than most would believe; we read 12,500' off the altimeter as we flew by Cerro San Juan. Nothing large appeared for a while -- although there is a large closed valley above Xilitla with alpine type karst -- should be worth a hike up. Then as we rounded the east side of the range, we almost fell out of the plane as everyone leaped to get their cameras out the same window -- a tremendous pit -- at least 300' in diameter with shear walls,faces Cerro La Cieta. We thought we might be able to see the bottom of the low side, but the high side disappeared into blackness. This then is the big pit we've been hearing about from Valle de Guadelupe, San Juan, and Tampaxac. We have nearings, but the pit is well isolated at about 9500' elevation. Finally we buzzed our own crew at Guaguas just as the clouds closed in.

On Black Holes

Upon returning to Los Sabinos with all this good news, it took little convincing (one good party) to round up 11 suckers to do the long hike into La Parada. Two days later Marion's overloaded 4 X 4 headed for Tancoyol. I left Los Sabinos one day later with Pat and Alex Cochrane. The hike in was grim to say the least. We carried all 1640' of rope we planned to use (funny how the number always was pushed higher anticipating a deep hole!). By the time my crew arrived in La Parada Tracey, Marion, and Henry were bouncing down the mountainside trying to beat the fog after a hard day of karstwhacking on the plateau. The good news...they had found the hole -- roughly 100' X 150' and a free drop from my side! The bad news...it was only 130-150' deep! Apparently the deception of depth was aided by a very dark green forest which covered the pit floor.

The next day almost everyone did Sotano de San Isidro to finish the survey. This immediately turned into an underground swimming party when Jim Smith found that the lake siphoned. Later that afternoon Tracey and Julia were led to two pits near Saucito (formerly Rancho Clavo). Sotano de Saucito was 160' deep and Sotano del Puerco Muerto was 220'. The following day Tracey and Marion returned to Saucito and the rest of the crew crashed up the mountainside to enter the big hole--Sotano de la Hoya Verde. The drop, as anticipated, was 150' free from the higher of two rig points. Very impressive hole -- for Tennessee -- well, you can't win 'em all!

Almost everyone except Pat, Tracey, Sheila, and I did El Socavon the next day. We diddled around La Parada, finding one pit: a 150' free drop into a large chamber with 3 skylights; this led down another 100' vertical to a lake. The locals called it "Hoya Hondo."

Well, everybody packed out the next day, all the way from La Parada to Tancoyol in one day! We briefly celebrated Mark's birthday and they split for the States.

Joya de Las Conchas

After dropping Pat off in Valles, we hiked up to the El Quirino plateau above La Purisima. The objective was to finish off Joya de Las Conchas, which Tracey and I had previously entered over Thanksgiving with Eric Means and Jim Jacobs. The first day of exploration was to be a light push trip, so Neal, Tracey, and I carried 1200' of rope up to the entrance. Things went well until Neal noticed a timber rattlesnake on a ledge 1 1/2' above our heads in the entrance crawl. Rather than molest the monster, we gingerly dropped past him and into the first pit. We quickly rigged to the point of previous exploration, 5 drops down. After this the drops got bigger. Four more drops and we landed in a waist deep lake. The passage continued as a sewer and apparently ended in a sump 100' further on. Then Neal found a tight hole in the ceiling which bypassed the sump. This led to a 25' semi-hairy climb down to a far more terminal looking sump. It had 2" air space, but Neal was convinced the passage went, so under he went -- back into wading passage! This went 100' to a 4 second drop! Far out. We ran out of rope at that point and returned to camp.

The next day all eight of us planned to finish Conchas. We nabbed the rattlesnake with a pole and slip noose, thus removing that danger. All went according to plan, for a while. Just as Neal was preparing to rappel the big drop, Roy Jameson came crashing through the sump saying that there had been an accident. Sheila had fallen most of the way down the 25' climb above the sump when a handhold broke and had to be hauled out at once. Damage was uncertain, but we suspected a concussion and fractured ribs to start. We were 9 drops down from the entrance and the picture looked grim indeed. Sheila would obviously have to be hoisted out all 9 drops. After negotiating the sump back to the base of the 140' drop we got down to business: 3 ropes were rigged on the drop, one static line for Julia to guide Sheila up the drop, one belay line and one haul line which we rigged from the top of the drop, one to one pulleys with a double jumar safety. Tracey and I did the auling; Neal belayed. The system worked so well that Julia had a difficult time keeping up with Sheila. This system worked excellently for the big drops. The narrowness of the rig points on the small pitchs demanded a different system. We rigged a 2:1 pulley system with auto locking jumar safety directly on Sheila's harness and hoisted from above using one man. By this time Sheila was cold due to inactivity and had to be placed in a wet suit. All went smoothly from there on. The entire operation took only 5 hours. Sheila was taken to camp and it was decided to wait till morning before attempting a trip down the mountain. The following morning we drove to the hospital in Valles, 20 hours had elapsed from the time of the accident. The X-rays revealed no breaks, just a badly bruised head and body. It is evident that had there been any serious internal damage our rescue effort would have been fruitless.

Two days later we picked up Martyn Farr on the recommendation of Neal and Julia (who had to leave) to try once again to bottom Conchas. Sheila was well enough to hike back up without gear. We took the afternoon off in preparation for what we knew was going to be a bear of a trip for 3 people.

The next day we left camp at dawn and Tracey, Martyn, and I arrived at the four second pit by 10 a.m. Tracey descended and reported a mud sump -- the end. Not believing this possible, Martyn and I took down some rope. Sure'nuff a tight squeeze through the breakdown immediately lead to another drop. I continued down this drop to another. Using all the rope we had, Martyn came down and assured me he could free climb the drop, so Tracey dropped the rope and went back for the other 4 sections. Martyn dropped the next pit and disappeared for 30 minutes. When he returned he said he was down another 200'+ to a big frop. Far out. Tracey dropped 4 ropes down the big pit and went back for a 5th while Martyn and I blasted on down. A 109' drop led to a 33' and 130' drop. God, this mother was going! We ran out of rope again and started free climbing pitches -- 4 of them. The passage was now dipping steeply -- quite a change from the "drop-level stretch" character of the upper cave. This went on to a 30' free pitch. We couldn't climb this one, so we tied all our slings together and Martyn descended. He followed this another 250', free climbing a 20' and 70' drop to a solution boulder choice. Upon moving a few boulders it opened to a 40' drop, the terminus of present exploration. All the drops here have waterfalls, apparently the cave is collecting tributaries the farther down we get. This necessitated two carbides running at once to assure both didn't go out. Nicad packs are a definite advantage down there. On the way out we stopped every 50' to sketch the passage, measure rope drops, and estimate climbs done.

By Bill Stone

1976 Conchas Expedition -Return to Conchas

On Friday, March 12, 19 cavers from Texas, Illinois, and England left Austin. In Mexico they rendezvoused with 18 other cavers from Texas, Tennessee, Arizona, New York, and Indiana. Much advance planning had been made; two group meetings had been held and various aspects of the expedition had been discussed. The planning was to prepare the group for any eventuality and bivouacking in caves had been one of the main topics of the discussions. An advance team of Don Broussard, Shari Larason, Peter Sprouse, Bill Steele, Bill Stone, Terri Treacy, Steve Ward, and Steve Zeman left Austin Thursday evening and drove to Falls City in South Texas where they spent the night at Gill Ediger's. The next day they left Texas, drove through Mexico, and camped that night at the Rio Santa Maria. Paul Fambro, Pam Lynn, and Mike McKee left Austin in Paul's truck and picked up Ron Ralph at the San Antonio airport. Maureen Cavanaugh, Alexia Cochrane, Andy Grubbs, Robert Hemperly, Logan McNatt, and Terry Sayther left in Terry's truck and Jill Dorman, Andy Eavis, Blake Harrison, Roy Jameson, Thomas Moore, Walt Peters, Peter and John Strickland, and Bob Whst left in Blake's "Hog of Steel." The various parties spent the night at different camping places in northern Mexico. Saturday, March 13: The Austin trucks continued driving and camped just past the town of La Purisima where the road toward Conchas takes off from the highway. Early in the morning the advance team arrived at the end of this road. They hired a mule for rope and caving gear, hiked in and set up camp. Sunday, March 14: While the Austin 19 hiked in, the advance team started to rig the cave.

Ediger, Sprouse, and Zeman returned after rigging to the "sump." Steele, Stone, and Ward continued till they bottomed the cave at a siphon 2 drops past the end of previous exploration. They returned at 8 a.m. After setting up camp, Broussard, Jameson, Larason, J. Strickland, and Treacy started a surface survey to connect all the known caves of the area. Monday, March 15; Tracy Johnson and Henry Schneiker arrived from Arizona by way of train, bus, and foot. They reached the general area Sunday night but couldn't find the camp in the dark. Jim Smith, Marion Smith, and Mark Stock arrived from Tennessee in Marion's car. Two teams started mapping in Conchas. Ediger, McKee, Sayther, and Schneiker started at the surface and mapped down to where the second team started. The second team of Cavanaugh, Eavis, Jshnson, and Sprouse started mapping at the start of the "sump" and mapped down to -348m. They bypassed the "big room." Hemperly, McNatt, and Ralph started mapping in the "Sotanito," previously explored cave in the area. They mapped about 75 meters. Cochrane and Grubbs returned to the trucks with a burro for another load of rope and gear. The surface survey crew finished the connection of all the caves. Tuesday, March 16: In Conchas surveying continued with Smith, Smith, and Stock surveying from the bottom of previous survey to the siphon. They dove the siphon to a depth of 4m. but found no leads. On the way out they derigged the last 200m of the cave. Dorman, Hwrrison, Hemperly, and Steele took a 100m rope and checked out and mapped the "Big Room." Cochrane, Grubbs, and Jameson made a biology, geology, and photographic trip down to about 300m and on the way out they hauled up the 100m rope used in the "Big Room." McNatt, Ralph, West, and Zeman finished the survey of the Sotanito, 213m deep. An attempt to find the Rendijas "fissure" failed because of heavy fog. Wednesday, March 17: Broussard, Eavis, McKee, and P. Strickland went into Conchas; they photographed on the way down and derigged the cave on the way out. They derigged to the top of the "twin drops." A hiking team located the Rendijas "fissure" but found it to be a surface feature 30' deep. Cochrane, Smith, Stone, Stock, and others checked out a 50m pit near Mojonera. On the way back they stopped at Sotano de Canoas and dug the log jam out of entrance. They went down as far as their ropes would go. Jameson hiked to San Jose and mapped a small cave, Cueva de la Mesa. He also found several 20-40m pits and was shown Sotano de Nogal, with an entrance drop of about 80m. Thursday, March 18; Kevin McGill, Barb Ransom, and Eric Valainis arrived from Indiana in Eric's behicle. Donald Spear arrived from Texas on the bus. The rest of Conchas was derigged. Smith, Smith, Stock, and others returned to Sotano de Canoas, mapped, and pushed till it ended in a siphon 100-120m down. Broussard, Cochrane, Grubbs, and Jameson hiked to Nogal. They checked the entrance drop and found a going passage, but further exploration was prevented by lack of more rope. Biological collections were made and air flow was noticed. Several people went on recon hikes but no caves were found. Friday, March 20:Cochrane, Jameson, Stone, Ward, and Zeman returned to Nogal and mapped down to 247m where they ran out of rope at the top of a 50m drop. Air flow was noticed at several places. Except for Broussard, Ediger, and Larason all the others left and hiked out. A burro load of rope and equipment also left. Once the vehicles were reached the first stop was a tienda with cold refrescos in La Purisima. The next stop was the Rio Santa Maria. From here the expedition split up with persons going in several different directions. Some people went directly back north, some went on south to Mexico City, and other points of interest. Several of the vehicles went through Xilitla. The "HOG of STEEL" then went to Golondrinas. On their way back they met the Nogal crew several times near Gruta del Palmito. The final depth of Hoya de las Conchas is 508m. This makes it the 5th deepest in the Western Hemisphere.

Andy Grubbs

[see the loose map of Hoya de las Conchas]

First Exploration of Nogal

Thursday afternoon Alex Cochrane, Don Broussard, Roy Jamison, and Andy Grubbs returned from a scout trip to San Jose two miles north of Conchas. The locals showed them a rather deep hole named Sotano de Nogal near town. One entrance is a 260' free drop in very large passage. A 5X5 foot hole led off the bottom to a 30 foot climbdown and a 30 foot drop where they ran out of rope. (They had to tie a knot 60 feet off the floor just to do the entrance drop!) They reported air blowing strong enough to put out a carbide light!

So the next day, with great difficulty, we managed to rouse 5 people from the 37 at camp to hike out again with roughly 750 feet of rope. We arrived around noon at the double entrance (60 feet from the 250 foot drop is another 200+ foot drop which surely connects but has yet to be descended.) Steve Zeeman did most of the rigging while Steve Ward and I shot the survey in behind him. Roy kept book and Alex did a bio collection. The passage was so pleasant, dry, and spacious that Ward and I had no problem keeping the survey right on Zeeman's heels as he rigged each virgin drop. Beyond the 30 foot drop was a 60 foot pitch, followed by a 140 foot drop with a knot 30 feet off the floor. The room above this drop was the most striking example of bedding exposure in a cave I've ever seen. Dipping almost vertical, huge scabs just stuck out of the walls and floor. Slickensides and an obvious fault wall were quite impressive. Beyond the 140 foot drop was a steep climbdown for 50-60 feet then another 100 foot drop into the "Greccian Column Room." A 60 foot drop off here led across a crystal lake, through more sinuous passage and finally another 50 foot drop where we ran out of rope. This was unfortunate as just 50 feet away was another 150-foot-plus drop. Que Lastima! The cave was still pushing a lot of air, even at that depth. The survey showed that the top of the 150'+ drop was 800 feet below the entrance. The most significant differences in Sotano de Nogal are what will undoubtedly make it deeper than Conchas. One, Nogal is a "Paleo-Floodwater" cave, apparently taking huge amounts of drainage long before San Jose was established. This circumvents the main cork in just about all of the San Juan plateau caves. The advent of farming allowed tons of silt to be sloughed off by arroyos everytime it rained. Since all drainage on the central plateau is internal, that silt only had one place to go -- right down the tubes. Jamison reports a usable limestone depth of about 2700 feet from the plateau to the Rio Jalpan (altimeter readings). Almost all the San Juan systems consequently silt up at constriction points far above the usable limit of limestone. Hence, since Nogal has none of the silt problems the other caves do, it is quite expectedly a clean, cry cave as far as we pushed. Secondly, the evidence of a strong air flow as deep as -800 feet indicates considerably more passage -- or a lower entrance -- something none of the other caves show -- almost all the others have bad air and organic debris near the bottom.

Without stepping too far beyond reason, I would say that some May when we return, San Juan will have its second 500m+ system!

Bill Stone

The Sierra de El Abra at Quintero
November 24-27, 1975
Neil Montgomery, John Parker

John and I caught a bus down from the border and arrived at Quintero early on the 24th. We shifted loads of over 100 pounds each up the mountain preparing for a seige on this little visited but promising part of the Sierra de El Abra. Leaving our gear at a radio relay station on top of the range, we began to explore the area to the west. Here we found many undistinct tracks, some of them made by wood cutters from the village. Two leads were located during the day -- a pit about 30m deep dropping into a large passage and nearby the 40X70mX30m deep collapse entrance to Cueva de las Colemenas, a cave visited several years ago by Bill Russell, but not fully explored.

A major problem appeared during the day -- the area was crawling with ticks. We each received several hundred bites and for night-time security slept on the flat concrete roof of the radio relay station.

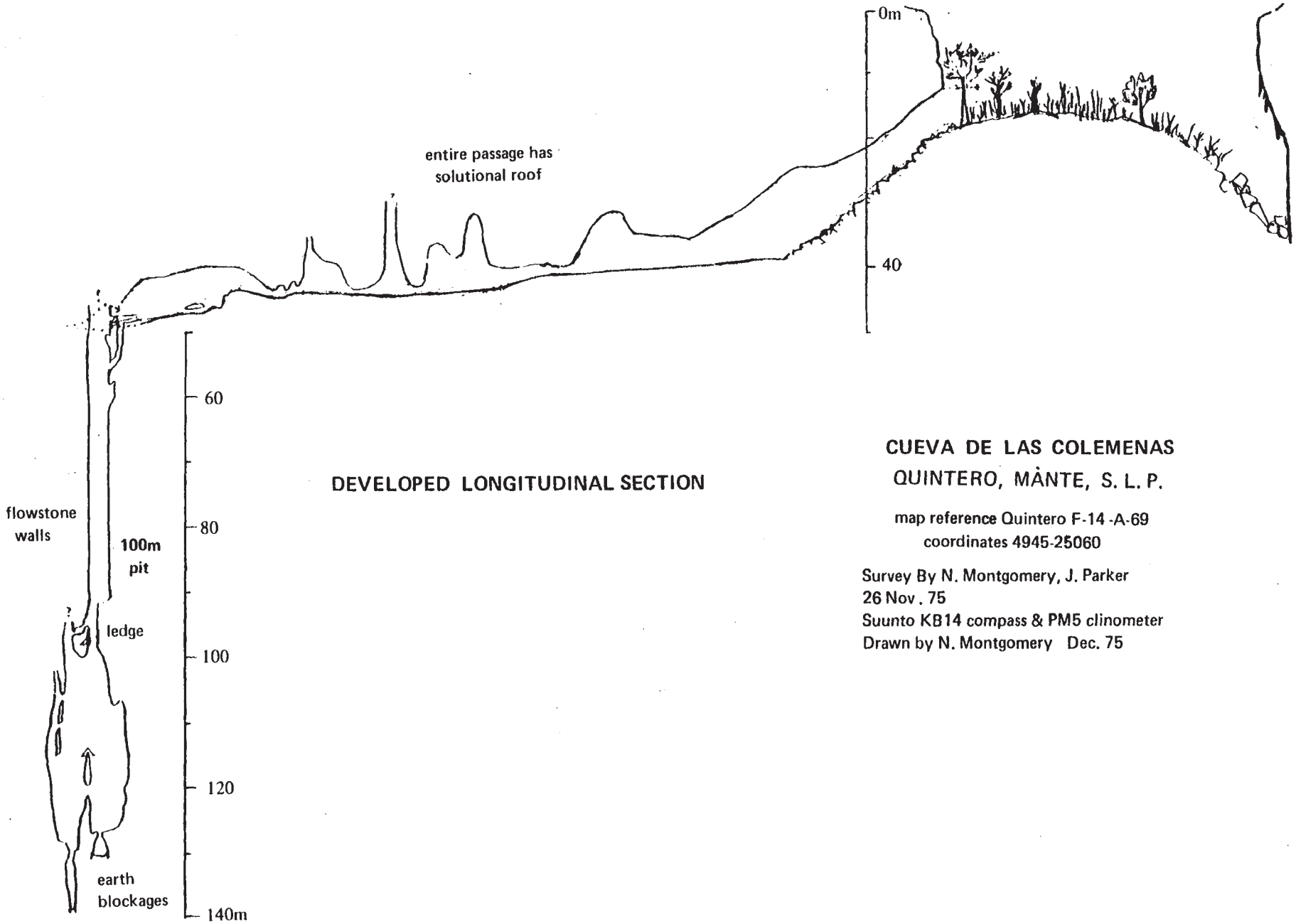
On the 25th we relocated the 30m pit and descended it. To our dismay the large passage below wuickly brought us to the Colemenas entrance. Cueva de las Colemenas consists of one large chamber entered by several pits. Only the 40 X 70m collapse pit permits entry without rope. There is only one significant passage leading from the chamber. This goes north 100m to where a crawl leads to a deep, 3m diameter pit. The cave is well known to the local people, who have exploited it for phosphate rich earth. In their diggings they opened up the northern end of the 100m long passage, revealing the top of the deep shaft. We descended the shaft, a drop of 100m done in two pitches. At the bottom was the signature "German" which was a little mystifying. There are no records of cavers having bottomed it.

Next day we surveyed the cave (see map) and walked down to Quintero for water. We were becoming dispirited from the tick bites, receiving many new ones each day.

New territory for the 27th: We followed a track north one kilometer until it faded and cut for another 600m to an "intermittent lake" shown on the Quintero topo map. These lakes are often pits. Colmenas is marked as one. The "lake" was not a pit (or a lake for that matter) but we did pick up a good track there. This was followed one kilometer north to a small settlement in a valley in the range top. The track continued north beyond the settlement past numerous small pits and dolinas as it climbed out of the valley. Two of the pits required rope (30m) and we weren't carrying any. They did not look promising however being narrow and vadose. Nearly all of the important caves of the Sierra de El Abra are remnants of large phreatic systems. Still, a search of this immediate area may produce something.

The track faded one kilometer from the settlement and we followed small disconnected clearings for another km to an area containing four "lakes," directly above El Nacimiento (the Rio Mante source). We found nothing here and attempted to drop down to the spring whose clear blue water was driving us mad, for it was a very hot day. We were stopped by cliffs 200m above it and headed back to the settlement and down hill from there to have that long awaited swim.

That night we decided we were tired of being tick meat and left next morning. We had not covered much of the area.



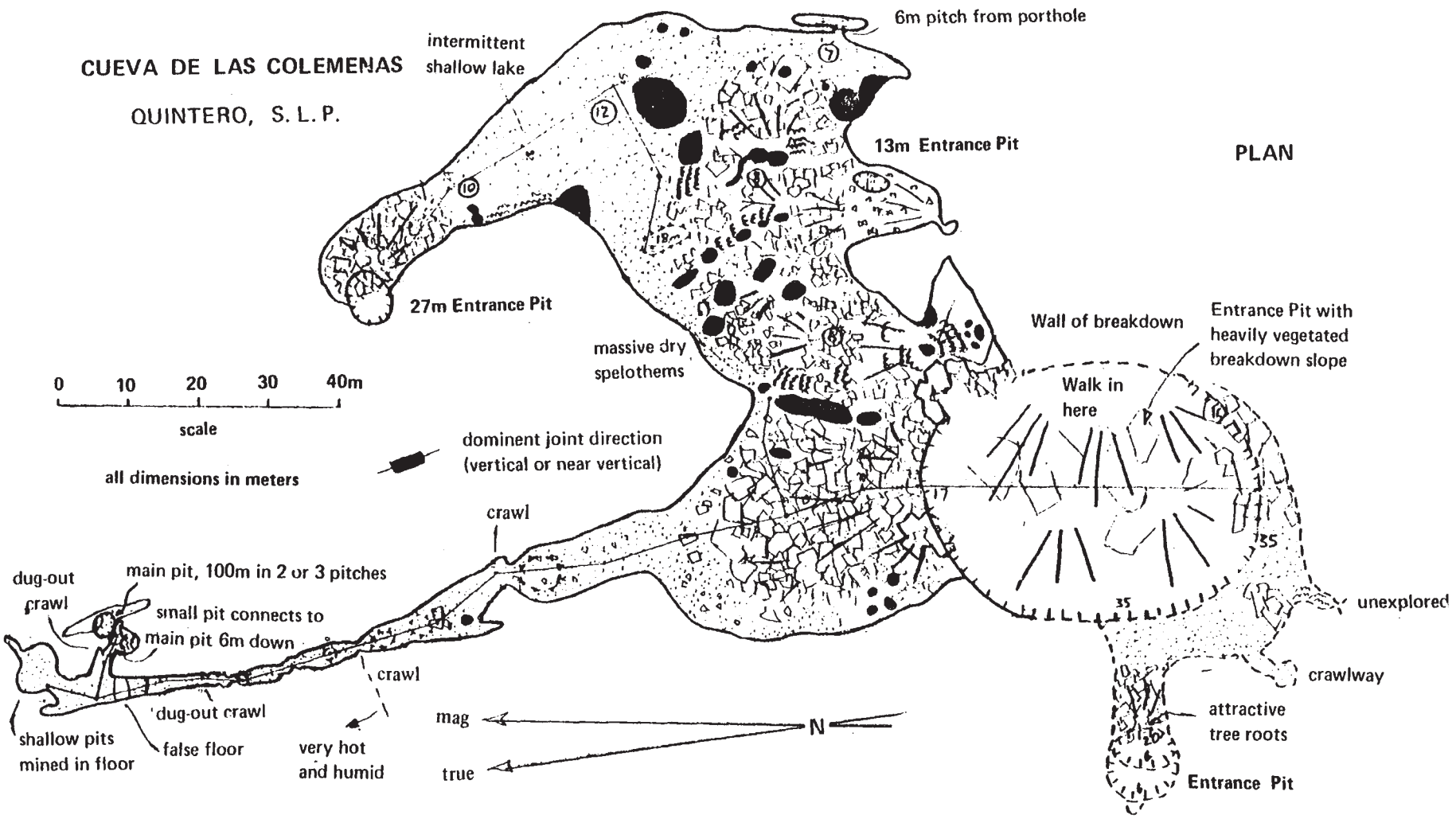
DEVELOPED LONGITUDINAL SECTION

CUEVA DE LAS COLEMENAS

QUINTERO, MÀNTE, S. L. P.

map reference Quintero F-14 -A-69
coordinates 4945-25060

Survey By N. Montgomery, J. Parker
26 Nov . 75
Suunto KB14 compass & PM5 clinometer
Drawn by N. Montgomery Dec. 75


CUEVA DE LAS COLEMENAS
QUINTERO, S. L. P.
PLAN
intermittent shallow lake
6m pitch from porthole
13m Entrance Pit
27m Entrance Pit
massive dry spelothems
Wall of breakdown
Entrance Pit with heavily vegetated breakdown slope
Walk in here
0 10 20 30 40m
scale
all dimensions in meters
dominent joint direction (vertical or near vertical)
crawl
dug-out crawl
main pit, 100m in 2 or 3 pitches
small pit connects to main pit 6m down
crawl
dug-out crawl
shallow pits mined in floor
false floor
very hot and humid
mag
N
true
unexplored
crawlway
attractive tree roots
Entrance Pit

Date: January, 1975
Destination: Acahuizotla and Gruta Cacahuamilpa, Guerrero
People: Diana Daunt, Ilya Abolins, Don Coons, Skip and Kathy Roy, and Carl

Diana, Ilya, and I were spending a month in Mexico. We had made tentative plans to meet Carl and the Roys at Acahuizotla, a small puebla about 20 miles south of Chilpancingo on the main road between Mexico and Acapulco. Skip and Kathy had been there a couple of years before. They had been shown the entrance of a large river cave and so were anxious to return.

As such plans go south of the border, I had only the slightest hope of actually meeting them at the time and place agreed upon. As we pulled in we were more than delighted to see three mangie looking gringoes sipping their sangrias on the steps of the only tienda in town. Greetings and warshoops and we soon found a place to camp just outside town under an overhanging roadcut in the old Acapulco road just outside town.

Strategies of attack were the next event. Skip know of two entrances to the cave. The upper sumidero where the stream disappeared and the lower boca where it emerged nearly 3 kilometers away. They had tried to enter the boca that day, but were turned back by waterfalls and Skip's cold allergy. It had been a near thing and the Roys were opting to go on to Acapulco the following day, but Carl had hiked to the sumidero after the earlier abortion, and so knew the way to both entrances. He was willing. We agreed to meet the Roys in Acapulco two days hence and began sorting through gear. Diana was suffering from Montezumas Revenge and would not be able to go.

The two of us set out for the sumidero the next morning. We carried two ropes since we knew there was at least one drop at the entrance and probably more inside. I would have liked more, but it was all that was available. A 30' handline drop ate our first line getting into the entrance sink. A 70' drop out the bottom of the sink put us into the cave dry, but out of rope already. We managed about 1000' of passage in wetsuits and inner tubes. It was mostly wading with an occasional short swim. A roar ahead told us something was happening. Another 70' drop, this one in a waterfall. We soon found an overflow route that could be rigged dry, but with no rope there was nothing to do but throw rocks. They hit in deep water, but we could not see bottom for the mist.

We were soon out and enjoying another sangria. The day was yet young so we decided to have another go at the lower entrance. Diana and Ilya wanted to take a swim, so we all trooped off together. It's about 2 km to the entrance, but nearly level going. We were surprised to meet two men and their children from Cuernavaca at the entrance. They were butterfly collectors, but had ventured into the cave as well. One of them wanted to return with us, so we all started together.

We made about 700' without much difficulty. The water is deeper here and swimming is a must for much of the way. Several 3-4 foot falls had been little trouble, but a 6 footer was a little more of a challenge. I tried to lassoe an overhead projection, but with little luck. Our Mexican friend tried it next and was able to go straight up the chute to the top. This was too much for Carl. The noise and foam had begun to take its toll on his nerves and he decided to return. I was able to follow up the falls, which turned out not to be the tiger we had feared. Another 100' and we were faced with a fall of the same height as the last, but overhanging this time. Try and try again could get neither one of us up. After half an hour we were nearly ready to leave, but there's always that one last try. A

struggle and the key hold we had missed before put me at the top. I tried to haul my companion up behind me, but the force of the water was too much. There seems to be much more water here than at the upper entrance.

I managed another 100' over yet another falls, but was then faced with a 12-footer that was too much. Bolts would be the only way. I am convinced that the best way through this cave is from the top, with a lot of rope. Downstream was a cinch! The falls on the way in were chutes, like a sliding board, on the way out.

Back out in the sunlight I soon found out my new friends name was Marc Antonio Narro and that he could speak a fair amount of English, although he was somewhat hesitant about it. He is a butterfly collector, mainly, and caves only on occasion. He knew of the Mexico City caving clubs, but was not a member. He did not think they knew of this cave.

A week or so of basking in the sun at Acapulco was next in order. The sun and waves seemed to put caving a long way from anybody's mind. I soon lost all support for a return trip to the river cave. Diana and I burned out (literally) before the others and decided to head for Gruta Cacahuamilpa and the mountains. We did a side trip to Grutas de Juxtlahuaca and met the others a couple of days later.

I had been hearing persistant rumors for some time about an extension through a hole in the flowstone wall at the end of the commercial route. One of the guides assured me that it was there, pointed out the way and said there would be no problem in going any time we wanted. The Revenge and a bright sunny day took their toll on the others, but Skip and I decided to go.

We were soon at the end of the trail, took our leave of the tourists, and climbed up into the formations. I had looked for this hole the year before and so was somewhat embarassed at what we found. There were three holes, including one large enough to walk through. Ahem, how well did you check that lead? The way opened into a breakdown jumble just behind the flowstone. A little poking got us up and into a room about 75' in diameter and nearly as high, but from there every hole seemed to choke within 50'. Finally the only way left was up. The wall was guano covered breakdown, but looked like it might be just climbable. Besides there was a note written in carbide on the wall of the room that read "Mas nombres quince metros mas ariba" with an arrow pointed up. We had been following arrows and names most of the way so this seemed to be the place.

I started the climb, but was a little hesitant. We had not brought a rope so there was no belay. It turned out not to be as bad as I thought. There was one exposed move near the top with 50' of fall below, but it was soon over. From a ledge I could see Skip below and what was more interesting, on the wall beside me were the "nombres mas arriba". There was a cast iron piton rusting in the wall with a loop of manilla line through it. I had no rope to belay with even if I had trusted the protection point. The only way on was up a guano slippery overhanging chimney. It is climbable with a little more security and above I could see only blackness. (It wouldn't be a good caving story without that now would it.)

I guess there's always next year. Both these areas seem to have good potential. If anyone is interested in trying them I would be glad to help with more information. I might even be convinced to act as a personal guide with a little arm twisting. Drop me a line.

Don Coons

Trip Report, Christmas-New Years 1975-76

Harold Goldstein, Cady Soukup, John Ferguson, Ron Tilkens, Neal Morris, Barb Vinson, Richard Minton, Mark Minton, Lew Fischer, and Linda

By Mark Minton

Our diverse group met in Austin on Dec. 21 and proceeded to the border, where for the first time in several years we had hassles with long hair. A little waiting and a tip or two and we were on our way, unshorn. After the usual car trouble (a fire), we arrived in Valles where we took on supplies, and then headed for Mina Otate. The permission we had obtained at the collective was not checked (nor was anyone else's this time), contrary to reports from earlier in the year. Our main goal was to map and finish exploring Cueva de Diamante, first entered the previous Christmas and subsequently shown to be a major cave. Trips went into the cave almost every day for a week. The route down from the Crystal Room as followed by A. Grubbs et al. last March could not be pushed further without blasting -- all leads down pinched out too tight, although definitely not at the "bottom" of the cave. The lead just above the Crystal Room noted by Minton turned out to be an alternate route down, intersecting the Grubbs route two or three hundred feet below. This route now carries all of the water entering this side of the cave, leaving the Crystal Room dry. This area of the cave is extremely sharp and jagged -- gloves are mandatory.

The tight canyon, the other major passages in the cave, turned out to be more exciting. The pit which halted last year's exploration was an 87 foot drop which led in about a hundred feet to a 70 foot pit (which is difficult to reach due to the necessity of changing levels in the canyon). Contrary to anything else in the cave, this drop was covered with a layer of mud. Scarcely fifty feet further a four second pit again halted exploration. On the way out of the canyon several Pleistocene remains were discovered in an eroding gravel fill. Bone fragments, horse-like teeth, and a mammoth molar were found, and samples were taken back to the University of Texas in Austin.

All known passage in the cave was mapped. The Crystal Room route bottomed out at about -900 feet; several hundred feet short of potential. The Canyonlands route remains to be explored: the top of the four second drop is about -500 feet, blows air, and takes water. In all we spent 289 man-hours in the cave, and had 1450 feet of rope rigged in the cave at one time.

Although trips went into Diamante nearly every day (and night!), most people layed out every other day to rest. During these rests Barb and Neal did a surface survey tying in the mine, Sotano de Otate, Cueva de los Indios, Cueva de Diamante, and Casi Mil. We also chopped around the Diamante sink near the crest, but found only one small, blind 60 foot pit. Most significantly, we visited Sotano de los Bozos (alias Casi Mil) and decided a resurvey was in order. Total depth is actually less than 500 feet (Casi Medio Mil?). During the time this cave was rigged, our total amount of rope under the sink came to 2250 feet! (out of about 3500 we had along). Some photography was also done in Indios. Although we had intended to chop around the

three large sinks on the way to Cuesta, it never got done. Nor did we check Sotano de Otate again. A careful, thorough exploration of the large bottom drop is warranted, but if it doesn't come soon it may be too late: the miners are dumping their tailings into the entrance!

After eight days in the jungle we returned to Walles for much needed baths, food, and rest. After a refreshing day at Micos, Barb and Neal returned to the United States and the rest of us went to Los Sabinos to decide on further plans. Here we met Roy Jamison and Patti Mothes who had just completed several days of flying over the El Abra and had some good sounding chopping leads. The next three days were spent hiking and chopping, but nothing new was discovered. One lead turned out to be Monos, unrecognizable from the air due to recent expansion of a nearby corn field. From there we also visited Higueron. (The "road" to Cueva Pinta is now in horrible repair, making it virtually impossible to drive all the way in.)

We then headed south to Mexico City for some touristing and to climb nearby Iztaccihuatl. We didn't reach the summit due to lack of ice climbing equipment (and enthusiasm), but did make it to the lower hut at 16,000 feet. That pretty well did us in, due to lack of acclimation: we went from Valles near sea level to the hut at 16,000 feet in less than thirty hours! After a stop at the famous anthropology museum, we returned northward.

The next two days were spent at Huichihuayan trying to make some sense of the Cueva del Aire-Cueva del Brujo system (a couple of years earlier Tom Ramsey and I had found a connection between the two). After several hours, we determined that the two caves are merely lower and upper entrances to what is essentially one very large room divided by breakdown and formations, and set on a steep angle. In an effort to reach the level of the large spring which resurges just below the caves, only a very muddy siphon was found. The caves are still very actively used for religious purposes by the local Indians, although we encountered no problems.

A brief visit to the Nacimiento del Rio Huichihuayan, a rather unusual Saturday night playing pool in a local tavern, and a drive to Xilitla and Sotano de Huitzmolotitla ended our trip. After stopping for a final swim at Nacimiento del Rio Mante, we returned to the United States after 22 days in Mexico -- already making plans for next year.

* * * * * *

A Hot Caving Area Surpasses Expectations

A recent trip to Sotano de Sauz just south of Big Bend by Gill Ediger, Dino Lowery, John Omnas, Ron Ralph, Terry Sayther, Peter Sprause, Beth Everett, and Steve Zeeman found the cave to be larger and deeper than expected. The cave is 4000 feet long and 722 feet deep ending in a large room 100 feet in diameter, 2500 feet long, with an air temperature of 106°F. Blocks of ice were packed in to help combat the heat.

During the exploration of Sumadero Yochab, Irv Grahm and Ian Drummond walked to the rumored resurgence of the river 4 hours down the canyon. They found a large bat cave called Cruz Palal with water flowing from the entrance.

THE OTATES MINE AREA

SIERRA DE EL ABRA, TAMAULIPAS, MEXICO

By Neal Morris

Location

The Otates phosphate mine is located on the eastern crest of the El Abra just north of the San Luis Potosi-Tamaulipas state line. Within a short distance of the mine are four large, important caves: Sotano de Otates, Cueva de los Indios, Sotano de Casi Media Mil, and Cueva de Diamante. Access to the area is by the mine road which begins near El Salvador, Tamps. (Km 49.2), on the Inter-American Highway. To enter the area, written permission is required from the authorities at the Ejido Collectivo "Laguna del Mante" (formerly the Ponciano Arriaga Ranch, Km 25.3).

Exploration History

Mexican prospectors first began working the Otates deposits in early 1974. Originally they reached the mine from the Ejido Olimpico by following a small valley or arroyo up the El Abra's east face, however, the phosphate deposits proved extensive enough to justify building a road in from the Pan-Am Highway. This amazing road had nearly been completed by December 1974 when cavers first became aware of its existence.

Our group was trying to reach a pit known from air photos (Hojas Grandes) by chopping up the east face of the range. Efforts to find a Mexican guide on the Ejido Olimpico were futile. The local people said that it was too dangerous to climb right now -- dynamite blasts from the mine were unpredictable and could send large rocks crashing down the mountainside. They suggested that we drive around to the other side of the range and use the new mining road! It did not take us long to take their advice. The miners and road crew were extremely friendly and showed us two caves near the mine, Otates and Indios, which they had already explored in search of phosphate deposits (to explore a pit, the Mexicans would tie some brave individual to the end of a rope and lower him to the bottom). We quickly surveyed the two caves, except for the last drop in Otates which had to be estimated by rope lengths (see Trip Report, AMCS Act. News. 1:1).

Later in December, two subsequent groups combined their efforts to chop a 5-Km trail south from the mine to the star-shaped depression where it intersected the Tanchipa Trail to Sotano de la Cuesta. Two deep shafts were discovered along this trail Sotano de Sendero and Sotano de Arbol. Sendero was bottomed at 712 feet. On this trip the search was started for a legendary black hole near Cuesta. Diamond Cave was also discovered, and its upper section was surveyed (Trip Reports in AMCS Act. News. 1:3,5 and D.C. Speleograph, Mar. 75:12-15).

Another group arrived in January 1975. They explored Arbol to a depth of 540 feet and conducted another futile search for the black hole near Cuesta. They also chopped to three new pits south of the mine: Hoya de Hojas Grandes (-220'), Sotano de Arbol Sangre (-709'), and Sotano del Techo Crystal (-150'). This trip is written up in AMCS Act. News. 1:6 and in The Roc Cairn, Spring 1975.

The Otates phosphate mine is located in a small valley which cuts back into the Sierra for several hundred feet. Mining operations have intersected a small cave passage which was filled by phosphate deposits. Just below the mine and the cave, a small arroyo leads down the mountainside. The arroyo, the cave, and the mine valley are in alignment and seem to be structurally related.

Cueva de los Indios and Sotano de Casi Media Mil

These two caves were once joined on an intermediate level, but the connection is now sealed by massive flowstone deposits. It does not appear that this system was ever integrated with either Otates or Diamante. Indios and Casi Media Mil are both large phreatic passages which formed along E-W, N-S joints. There are no distinct bedding planes visible in Indios, and bedrock observations are nearly impossible in Casi Media Mil because the entire cave is draped in flowstone.

The Indios Sink is right on the crest of the El Abra, and the mining road borders it on the south side. The collapse opening is 40 feet wide and 235 feet long, and its walls are vertical, dropping approximately 40 feet on the low side and 60 feet on the high side. However, the south wall offers an easy climbdown along a joint. At the east end of the entrance sink is a low, wide room containing the remains of several stone walls which were probably built by Huastecan Indians. At the west end of the sink, a talus slope leads down to a flat, silt-floored passage where there are more archaeological remains. This passage is 20 feet wide, 40 feet high, and extends west for 375 feet before it is intersected by an upper level crawlway. This crawl leads north to a 60-foot drop (80' rope) into more large passage. This passage heads west and becomes plugged with flowstone only 350 feet from Casi Media Mil. The joint along which this passage is formed appears on the surface in the large dolina west of the mine, and this is the location of the 3x10-foot entrance slot to Casi Media Mil.

The Casi Media Mil entrance pit bells out quickly and drops 111 feet to a rock-strewn floor. To the east is a short passage which matches up with the lower level in Indios. A few feet to the west is a 43-foot drop (a single 180' rope can rig the entrance drop and this one). At the bottom is a flowstone squeeze, followed by a climbdown which leads to the top of the last drop. The total depth of this drop is 305 feet (350' rope), but after descending 50 feet against one wall, a large natural bridge is encountered on which several people can work comfortably. Once below the bridge, there is a 217-foot free rappel. This section of the pit bells out into a large, impressive chamber which is 120x70 feet near the bottom. The mud and gravel floor of this chamber is perfectly flat. There is a small pool in the center of the room, and a drainage channel leads to a sump against one wall. Casi Media Mil is well-decorated and has one highly unusual formation at the top of the long drop -- the remnants of a large, hollow sphere. It appears that flowstone was deposited over a mound of sediment, and later the sediment eroded, leaving only the flowstone shell. A smaller sphere is currently being formed by this process at the bottom of the cave.

Cueva de Diamante

Cueva de Diamante is located at the southeast end of the large dolina to the west of the mine. The cave has two small entrances. The most obvious one is in a sump at the end of the arroyo which drains the dolina. During

large storms, this arroyo sends floodwaters into the cave. A tight, devious crawl (unmapped) leads away from the sump and eventually breaks into larger passage. The second entrance is an obscure 2x2-foot hole in the karst about 30 feet south of the sump. This hole leads directly into the upper section of the cave, a 300-foot-long, steeply-dropping phreatic tube which averages 6 feet in diameter. Several climbdowns, crawls, and pools must be negotiated before reaching a series of wet, flowstone cascades known as Frog Falls (named for the numerous green tree frogs inhabiting the passage). These climbs are difficult, and a 100-foot handline is very useful. Just past Frog Falls, a domepit is encountered (100' rope). Thirty feet down this drop is a partition which divides the cave into two distinct sections: the Canyonlands and the Shatter Zone (Crystal Room or Grubb's Route).

Canyonland Section (basically a high, narrow crevice which requires changing levels frequently to find passage, often with no floor or ceiling visible and too tight to turn one's feet or head around in) includes, to the right of the partition, a domepit parallel to the one in which the rope hangs. A 25-foot climbdown leads to the bottom of this parallel pit. From here a walking passage quickly reaches the beginning of the joint-controlled canyons where the chimneying begins. After going 75 feet horizontally and losing 40 feet vertically, Size 28 Pit is reached -- a 22-foot drop which can be climbed by slipping down through a vadose trench if your waist is size 32 or less. It is an exposed climb, however, and should be rigged. At the top of this pit, a small fault is visible in beds dipping at 25 (see diagram). From here the tight canyon continues northwest for 125 feet. Then it changes joints and heads northeast, first as walking passage and then as narrow Z-canyon again. This trend continues for 325 feet until it is intersected by a vertical joint with a dip of 60 (see diagram). Here the canyon turns due east and starts dropping quickly. A 16-foot chimney leads down to an 83-foot drop (100' rope). From the bottom, another 75 feet of canyon goes to a 66-foot drop (100' rope), followed by another 50 feet of canyon to an unexplored 4-second drop which is 788 feet above the estimated base level. Although the canyon walls in this section are mud-coated, the last drop is scoured clean and blows air. Plans have been made to continue exploration in December.

Shatter Zone Section (basically vertical fissures and near-vertical, walking-size passage averaging 10 feet in diameter) continues, to the left of the partition, another 35 feet to the flour of the first drop. From here a passage slopes 30 feet to a series of offset drops which descend 142 feet (partially climbable, but best rigged with a single 175' rope). At this point the passage divides, and two parallel routes drop 260 feet before rejoining (on the diagram, the line labeled "fracture" points at this split). The Floodwater Route is a small, wet passage northwest of the divide which goes 50 feet to a plunge pool above a 15-foot drop (35' rope). A small, jagged passage then continues 20 feet to the top of a 66-foot drop (100' rope) down the wall of a fissure (20 feet below the lip of this drop, it is possible to get off the rope and explore a short side room which is encrusted with large crystals similar to the Crystal Room). The bottom of this drop is actually a bedrock "bridge" with the fissure continuing beneath it. On the west side a narrow slot drops into the fissure. On the east side a climbdown goes to a window which provides a 125-foot drop down the fissure (150' rope). At the bottom of this fissure is where the parallel route enters. The Crystal Room Route is a 40-foot drop (50' rope) into the Crystal Room which is named for the six-inch calcite crystals encrusting its walls. This drop is located 25 feet southeast of the divide. In the southeast corner of the Crystal Room, a climbable fissure drops 60 feet,

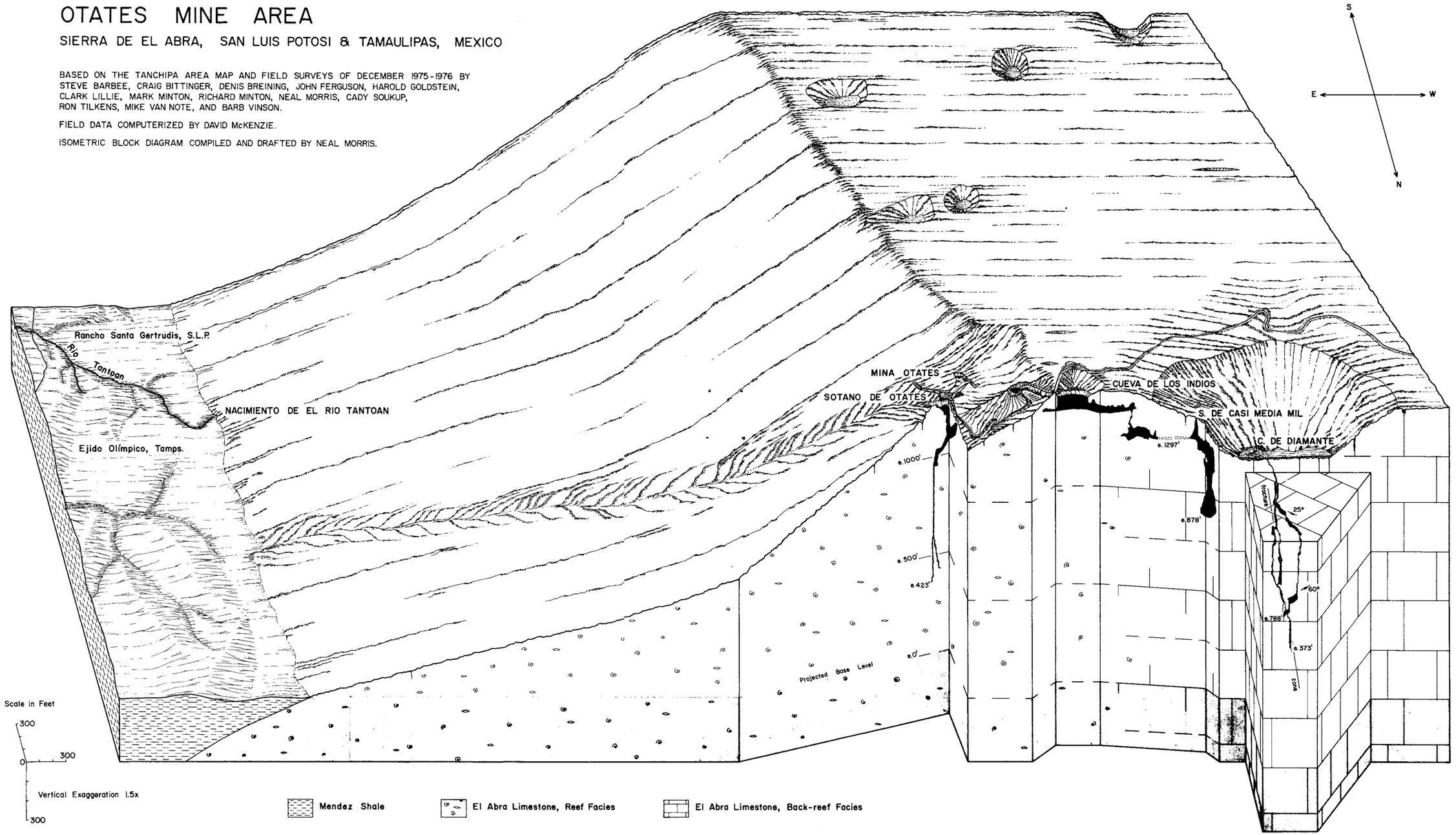
OTATES MINE AREA

SIERRA DE EL ABRA, SAN LUIS POTOSI & TAMAULIPAS, MEXICO

BASED ON THE TANCHIPA AREA MAP AND FIELD SURVEYS OF DECEMBER 1975-1976 BY STEVE BARBEE, CRAIG BITTINGER, DENIS BREINING, JOHN FERGUSON, HAROLD GOLDSTEIN, CLARK LILLIE, MARK MINTON, RICHARD MINTON, NEAL MORRIS, CADY SOUKUP, RON TILKENS, MIKE VAN NOTE, AND BARB VINSON.

FIELD DATA COMPUTERIZED BY DAVID McKENZIE.

ISOMETRIC BLOCK DIAGRAM COMPILED AND DRAFTED BY NEAL MORRIS.



but the handholds are unstable requiring that the drop should be rigged (75' rope) for safety. This is followed by a 35-foot chimney, a 10-foot climbdown, a 40-foot, offsetting drop (50' rope), and a 20-foot drop (30' rope). More climbdowns and a short, narrow passage soon encounter a tight slot which opens into a 14-foot climbdown where the Floodwater Route is joined. The Crystal Room Route is the one normally rigged. Although the Floodwater Route is more direct, it requires rigging longer drops through razor-sharp passages. From the junction of the two routes, a climbdown and a short passage lead to the top of a 30-foot drop. This drop can be rigged, but it is usually bypassed by doing an exposed traverse along the left wall to a 25-foot chimney. Below this drop, the passage splits where the water takes two parallel routes. On the left a climbable, small-diameter tube drops 40 feet before it becomes too tight and jagged for comfort (it could be pushed, however). On the right side, a tube 10 feet in diameter drops 100 feet vertically, via a series of climbdowns, to a 25-foot-long crawlway. This crawl leads to a hole which opens into the top of a fissure. It is possible to slip through the hole down to a ledge which provides a rigging point. Below is an 80-foot drop to a partition, and although it is "climbable," it is better to rig it with a 150-foot rope which will reach past the partition to the bottom of the fissure. On the left side of the partition (unmapped), the fissure drops about 20 feet to a lake where exploration was stopped by a constricted, razor-edged crawl. On the right side of the partition, the 3-foot-wide fissure drops 15 feet to a window. Through the window, the fissure drops 25 feet to a ledge and then 15 feet to the present deep point in Diamante, 907 feet below the entrance and 373 feet above the estimated base level. Here the fissure is 1.5 feet wide and 5 feet long. It continues 4 inches wide at one end and drops through an 8-inch-wide hole at the other end. Rocks dropped through this hole can be heard to rattle downward for a short distance. This hole could only be enlarged by explosives, and even this would be a difficult task.

Observations on Cueva de Diamante and the Mine Area

Diamante is a complex cave with an interesting history. The entrance passage appears to be an old phreatic tube which intersected a zone of intensely shattered bedrock in the Frog Falls area. The Shatter Zone passages exhibit angular limestone blocks of great size range which have been recemented together. Resolution of the zone has produced razor-sharp passages which demand that explorers wear gloves and carry rope pads. The Shatter Zone passages lie directly beneath the dolina, which supports the theory that faults and shattered bedrock have localized the formation of the large sinkholes found along the crest of the Sierra de El Abra. In contrast, the Canyonland Section is formed along joints and is basically horizontal, extending completely under the Dolina to the north before dipping 60 eastward along a vertical joint. Such a dip in this location would support the theory that the El Abra's eastern scarp is an anticlinal feature.

Canyonland appears to be the oldest section of the cave. The floor is deeply entrenched in places. Pleistocene mammal remains (horse, bison, and mammoth) were discovered in an eroding gravel bank in one area, however, most of the Canyonland is scoured clean. Canyonland still takes some floodwater, but most of the water is now pirated by the Fracture Zone passages, all of which are actively developing except for the abandoned Crystal Room Route. In the lower level of the Fracture Zone (once referred to as Handburger Hill), the water becomes divided among three passages which all pinch down to razor-sharp crawls, ending exploration.

In March 1975, a trip was made to continue exploration in Diamante. An approximate depth of 900 feet was reached via Crystal Room route. There was a minor accident below the Crystal Room when a handhold broke loose causing a caver to fall 15 feet. The miners also showed this group a new pit (Casi Mil) between the Diamond entrance and the mining camp (See AMCS Act. News. 2:7).

In June, a two-man team returned to the mine and explored the new pit. They estimated the depth at 735 feet and thus named it Casi Mil (almost 1000 feet), reported in AMCS Act. News. 3:5.

Mid-July saw a special trip to the area with the purpose of locating the elusive black hole. This group rediscovered Cuesta by using a "Parrot Bearing" as recorded in AMCS Act. News. 3:8,9 (Air-recon. has finally determined the non-existence of any black holes near Cuesta).

The most recent trip to the area was during Christmas 1975. Diamond was extensively explored and surveyed to a depth of 907 feet. Casi Mil was re-surveyed to a depth of 495 feet and re-named Casi Media Mil. Finally, a surface survey was made which connected the four caves near the mine. The block diagram with this article combines all of the survey work which has been done in this area to date (See Trip Reports in this issue and in D.C. Speleograph, April 76:3-5).

Geologic Setting

The east face of the El Abra drops steeply down to the coastal plain providing a spectacular view from above the Otates Mine. John Fish has postulated that the east face is a fault scarp, while William Russell has argued that it is a steeply dipping anticline. The block diagram depicts it as an anticline which sinks beneath the shale formations of the coastal plain. Also shown on the diagram are the two facies of El Abra limestone which have been described from other locations in the Sierra. The massive, unbedded reef facies forms a narrow band along the eastern margin of the range, while the back-reef facies is thick-bedded and dips gently to the west forming the plateau surface. Many caves (most with phreatic origins) have developed in areas of faulting and intense fracturing which resulted when the range was folded. All drainage on the El Abra is internal. Base level for the mine area is the Nacimiento de Rio Tantoan, a large spring at the base of the range. This gives caves on the plateau a maximum vertical potential of about 1500 feet. Cave elevations on the diagram are elevations above this projected base level.

Sotano de Otates and the Mine Valley

The 125 foot entrance pit (150' rope) to Sotano de Otates is located on the El Abra's east face just below the Otates Mine. In fact, the mine is currently dumping its tailings into the Otates entrance, and the cave may eventually be plugged. At the bottom of the entrance drop is a large room, from which a water channel follows a steeply sloping passage east several hundred feet to a handline drop (40' rope). This is immediately followed by a narrow 600-foot shaft (625' rope) which divides several hundred feet from the bottom. Exploration of this drop has been difficult, and both routes currently end in sumps. The lower sump is 800 feet below the entrance.

John Fish (1975) has typed many of the caves on the El Abra's east face as "paleo-phreatic resurgences" -- caves which were springs when base level for the area was at a much higher level than today. Otates would fit this category quite well. It is of phreatic origin, and the deep vertical tubes or shafts would have served to circulate water up from great depths.

Diamante received its name from the numerous quartz crystals (Herkimer Diamonds) which are found in the arroyo draining the dolina and throughout the cave itself. These crystals are probably residual from shale formations which previously covered the El Abra but now have been eroded to the present level of the coastal plain.

The El Abra facies change depicted on the diagram is supported by observations in the field. Bedding planes are absent in Otates and Indios but become traceable in the Diamante dolina and in the Canyonland section of Diamante. Further exploration and study in the Otates Mine Area should be very rewarding.

Geology References

Fish, John. 1975, Karst Geomorphology and Hydrology of the Sierra de El Abra, S.L.P. and Tamps., Mexico. (tentative title), PhD dissertation, Dept. of Geology, McMaster University, Ontario.

Russell, William H. and Raines, Terry W. 1967, Caves of the Inter-American Highway. Bulletin I of the Association for Mexican Cave Studies, Austin, Texas.

Note from Preston

Anyone planning on doing Cueva de El Chorreadero in Chiapas should have the following equipment: a selection of pitons, piton hammer, bolt kit, and at least 30 feet of one inch webbing. Reason: When our group went through the cave in January, 1976, we did not have most of the equipment as we knew the cave was rigged. However, a **safety factor** is involved since many of the piton placements are marginal and additional backup pitons and in some cases bolts are needed, especially in the lower part of the cave.

Preston Forsythe

Biology Notes

Preliminary study of pseudoscorpions collected this summer in Yucatan by Grubbs, McKenzie, Reddell, and Wiley has revealed a new genus from a cave in Quintana Roo.

A new Troglibitic Homopteran (plant hopper) was found this Christmas at Acatlan, Oaxaca, by Mike McEachern of the "School Bus." This is the 6th Troglobitic Homopteran in the world. Two are known from Mexico, two from Hawaii, and one from Australia.

A new species and possibly genus of Scolopendramorph centipede was found in Conchas. It is probably one of the deepest animals collected from Mexico; it came from the bottom of the 200' drop.

A.C. Grubbs

Christmas in Acatlan

Over Christmas, Terry Sayther, Shari Larason, Dennis Barnes, Marcia Cossey, Andy Grubbs, and Tom Byrd made a spur-of-the-moment all night drive to Acatlan, Oaxaca,in hopes of heading off the school-bus crowd en route to Guatemala. We never ran into them though, but we had plenty of caving to do while we were down there.

We paid a guide to show us as many cave entrances as we could see in one afternoon. We saw five caves that afternoon, all of them close to the roads and with a spread out distribution from ten miles north of the town to ten miles south of town. They were La Cueva de Juan Sanchez, La Cueva de la Junta, La Cueva de Buenos Aires, La Cueva de Piedra Fria, and La Cueva de Rio San Antonio. In addition to these caves, we also saw and checked out a 3-D maze cave at our campsite. It was exposed by the excavation of limestone at a Mogote in the middle of a sugar cane field. The cave is slowly succumbing to quarrying operations, so we named it "Disappearing Cave."

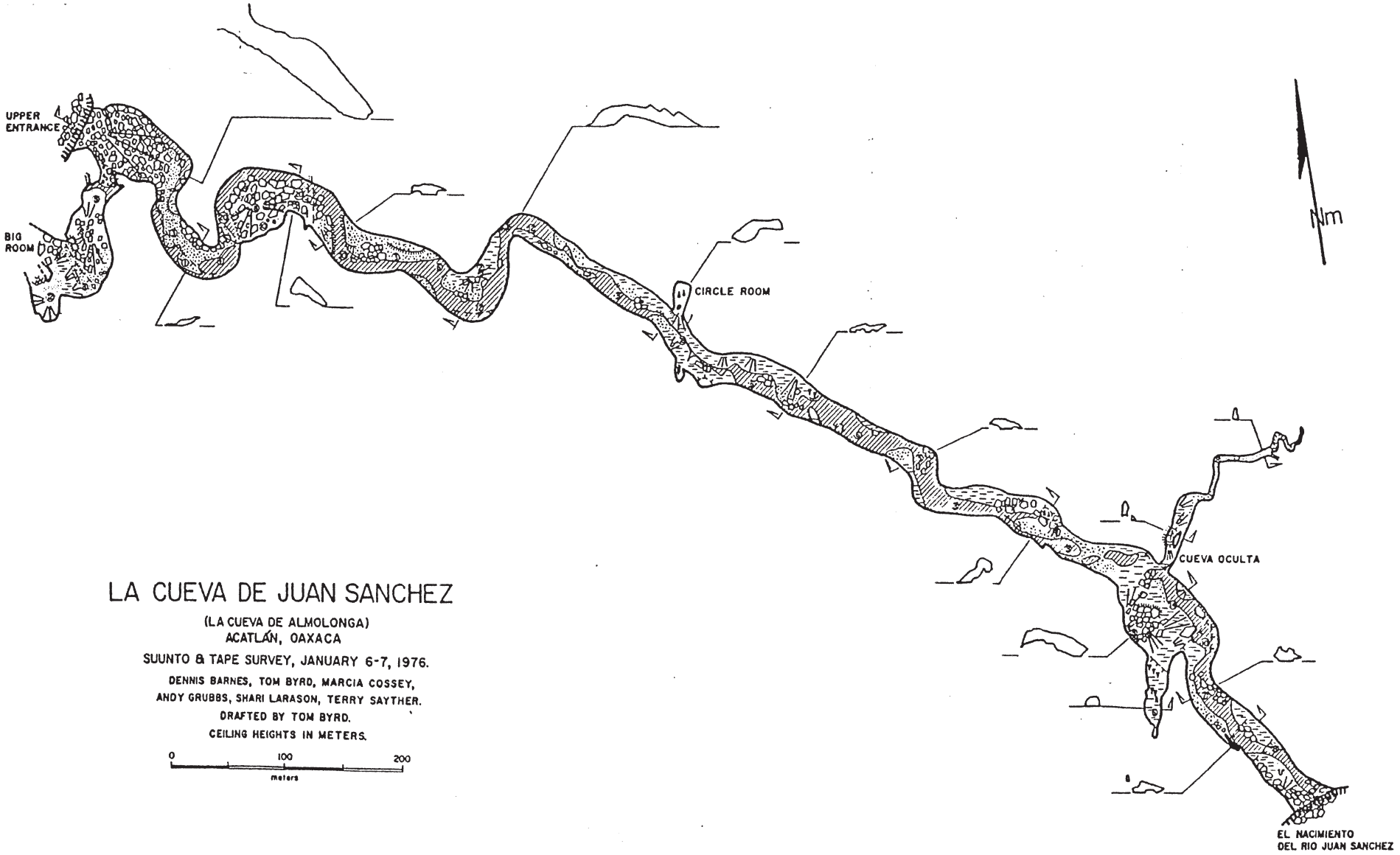
Our main activity was concentrated on the surveying of La Cueva de Juan Sanchez. The cave is located at the Nacimiento de el Rio Juan Sanchez and has a large, impressive entrance at the base of a 40m cliff. Immediately inside the cave, there is a large pile of broken pottery and many obsidian blades scattered about on the clay slope. From here there is a gently meandering stream passage which is 20-30m wide and 8-10m high. Soon after leaving the last traces of daylight behind, there is a large breakdown room with a high wide passage leading off to the left for a short distance, with pottery and formations. Opposite this passage is a narrow side passage leading off the main passage to the right. This passage was called "Cueva Oculta" taking its name from the writings of earlier explorers who wrote the words on a boulder at the entrance. It ended in breakdown where tree roots grew in from above. Throughout the main passage, there are terraces of conglomerated round cobbles of igneous rock ranging in size from pea size to grapefruit size, and on the walls in many places are scallops of varied sizes. There are several large breakdown rooms with high ceilings throughout the cave, and only in the high places are there any formations.

It took us two days to survey the cave and we did not finish. Late on the second day of the survey, we came to a large, steep breakdown slope extending upward to an upper entrance. From this large breakdown slope room is a side passage leading down to several large rooms. After some 13 hours of surveying that day, we decided to call it quits for a while after peering into the darkness of a huge bat room with giant breakdown blocks. We have indicated this as the "Big Room" on the map. We don't know how far the cave extends beyond this and we didn't have time to continue.

The cave, according to the local residents, is known by two names: La Cueva de Juan Sanchez (after the river) and La Cueva de Almolonga (after a nearby community). The people say that toda la cueva es seca en abril, but that in agosto, great quantities of water come out carrying logs and other debris.

This area around Acatlan is very promising. There are numerous roads among the low rolling hills of sugar cane fields and small anticlinal ridges and areas of haystack hills. Numerous dolinas can be seen from the roads. The locals speak of many sotanos in the hills. There is not much depth potential here, but the deepest caves are not far away on the Huatla Plateau. There are going to be some long horizontal systems and sotanos entering them from above in this area. We hope to return next dry season to finish Juan Sanchez and check out other caves in the vicinity.

by Tom Byrd



LA CUEVA DE JUAN SANCHEZ

(LA CUEVA DE ALMOLONGA)
ACATLÁN, OAXACA

SUUNTO & TAPE SURVEY, JANUARY 6-7, 1976.

DENNIS BARNES, TOM BYRD, MARCIA COSSEY,
ANDY GRUBBS, SHARI LARASON, TERRY SAYTHER.

DRAFTED BY TOM BYRD.

CEILING HEIGHTS IN METERS.

0 100 200
meters

AMCS ACTIVITIES LETTER

FRONT COVER

Photographed and printed by Gill Ediger

BACK COVER

Salamanders Revenge by Dino Lowery

ASSOCIATION FOR MEXICAN CAVE STUDIES
MEMBERSHIP COMMITTEE
BOX 7672 UT STATION
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Hoya de las Conchas

Ejido San Juan, Querétaro, México

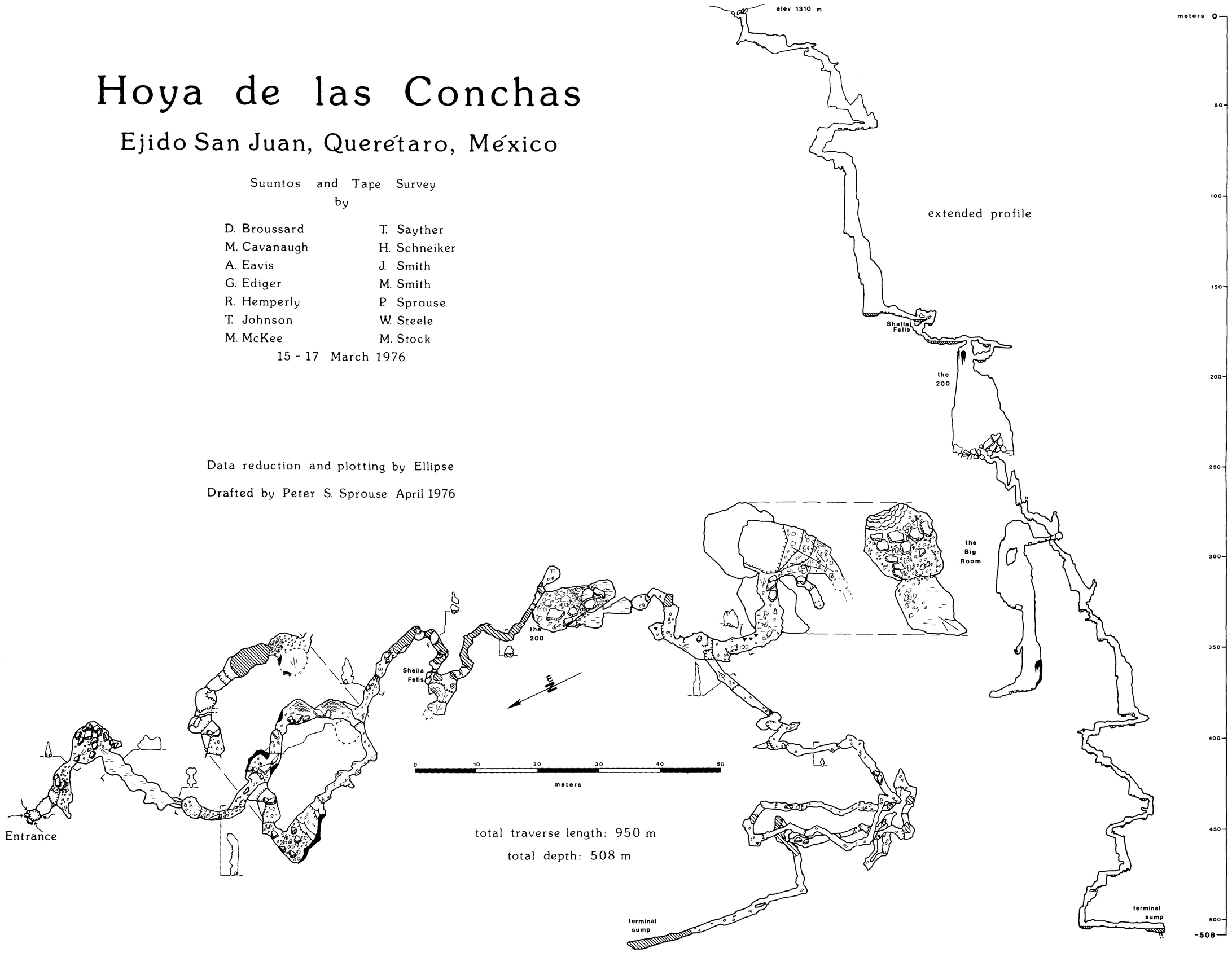
Suuntos and Tape Survey
by

D. Broussard
M. Cavanaugh
A. Eavis
G. Ediger
R. Hemperly
T. Johnson
M. McKee
T. Sayther
H. Schneiker
J. Smith
M. Smith
P. Sprouse
W. Steele
M. Stock

15 - 17 March 1976

Data reduction and plotting by Ellipse

Drafted by Peter S. Sprouse April 1976



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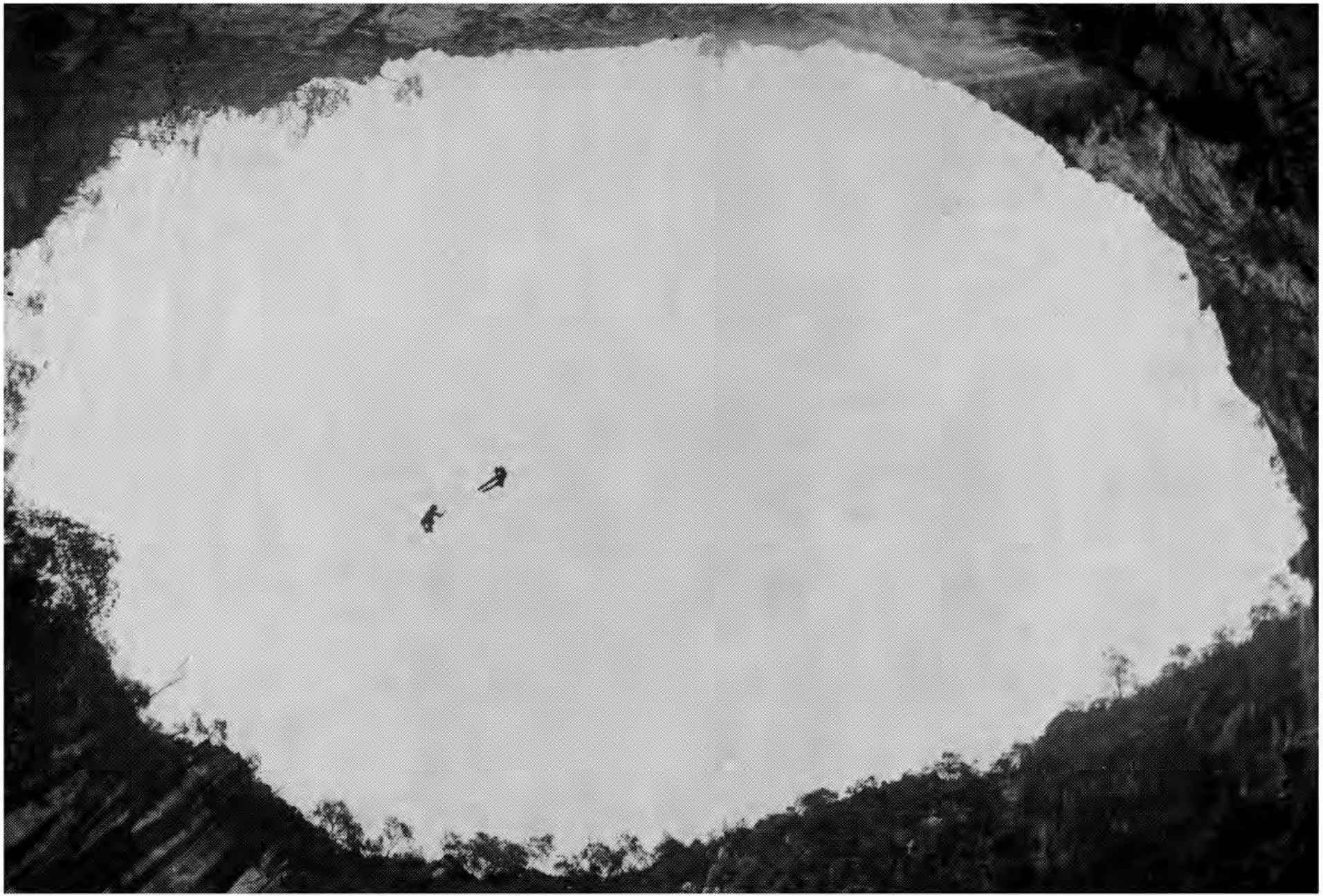
total depth: 508 m

AMCS



AMCS ACTIVITIES LETTER

Edited by Bill Russell

Production Assistance by Terri Treacy

Issue Staff

Jim Smith
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Fall 1976

Letter No. 5, Jan 1977

Xilitla Plateau Issue

This fifth Activities letter features trip reports to the high karst area above Xilitla, S.L.P. The first article by Bill Stone is a first hand account of discovery as he walks through a new karst area. The second article by Roy Jameson will bring you back to the cold reality of camping in the rain. Mexican caving provides plenty of both.

Though very promising, the difficulty of access and lack of known caves has limited exploration in the high karst. The first cavers to reach this area were Ron Bridgeman, Chuck Pease, Roger Bartholomew, and others in 1966. They packed up the steep trail from Tlamaya to just west of the prominent pinnacle of La Silleta, and checked several caves. But access to the rest of the high area was difficult from this far east - so exploration did not continue. About 1968, T.R. Evans and John Fish crossed the high karst and explored a cave that drained a large area, but it siphoned after a series of small drops. No other promising caves were found, and a brief reconnaissance on foot by Bill Calvert and Victoria Foe who crossed the high area and walked to San Juan at the south end of the La Parada valley also failed to find any promising caves.

These early trips indicated that the high karst had potential, but until Stone and Jameson visited the area to explore Hoya de la Luz, the large tree floored pit located from the air, there was little detailed knowledge. The Xilitla high karst has the potential for some very deep systems, as the water that sinks in the highlands resurges at the Nacimientos of the Rio Huichihuayan at an elevation of 110 meters.

ASSOCIATION FOR MEXICAN CAVE STUDIES

Summer In Valles

May 10 - June 17

by

Bill Stone

Participants: Bill Stone, Larry O'Loane, Roy Jameson, Patty Mothes, Tracy Johnson, Gary Stiles, Tom Strong, Louise Strong, Don Broussard, Shari Larason, Gregg Astfalk, Paul Gillette

The 8 weeks between the Conchas Expedition and the end of Spring semester passed quickly. We barely finished the rear end transfusion on the Bozo Bus before being sucked down once more to the land 'o sotanos.

We drove straight from Tucson to Lobos in 32 hours. Gregg had never done a long drop before so we yo-yoed the 620' pit. After a day at Micos and another in Sotano del Arroyo, we headed for "Drinas" hoping to swing into Don's elusive blowing air passage. Both days on the trail were hot and sunny. As expected it rained the day we descended. Two 300' lines down the fissure later we were penduluming through the darkness in search of anything unusual. The most exciting discovery was a can of JUMEX sitting on a stalagmite way out in the freaking hole 250' from the floor! After a spooky ascent through our campfire smoke column we beat a quick retreat to the Condesa.

Gregg and Paul split for Tucson; Larry, Gary and I to Micos. Two days of careful preparations in an innertube under the falls later we arrived in Xilitla. Yep! Black hole time again! I had a vague idea of where the big hole was; I figured any trail that would take us above Cerro la Silleta where we could take bearings would do. The locals recommended starting at El Balcon, 4 miles to the west.

After discovering, amid heckles in Aquismon, that shorts weren't in Vogue in the mountains we waited till we were a half mile down the trail before switching. The heat and humidity were almost unbearable in long pants. Anyone who has been to Xilitla and tilted back their heads to view the towering plateau can rest assured that that is precisely where the trail goes -- straight up! Yes indeed, 8 hours later we were still ascending -- the trail had not leveled once. Nebulous trails, sparse population and confusing compass bearings (like why were we headed west instead of east!) added to the adventure.

Far above the sea of clouds which covered Xilitla, we trod through a karst landscape which puts the Sierra de Guatemala to shame.

By dusk we finally crested a ridge and began descending into a

View across the bottom of Hoya de La Luz
The foreground is free of vegetation due to falling water. Some of the trees are over 100 feet high.

Looking across Llano de Caballo toward Cerro de La Luz, the highest peak in the Xitlta Area. Llano de Caballo is typical of the flat floored dolines in the high karst.

large depression. Only in the last 100 yards did we realize that it was a great alpine meadow, perhaps a half mile across. This, we discovered, was Llano de Los Chiquitos when a lone horseman greeted us the next day at dawn as we huddled around our campfire. Cold? - there was frost on the llano till 9:00 AM! Upon explaining that we were in search of a great hole near la Silleta he professed lack of knowledge of its location -- but invited us to look into another hole on the llano. Our trail weary minds could conjure up nothing but amazement as we strolled down the 100' wide 50' high passage of Cueva del Llano de los Chiquitos. Yes, there are caves above Xilitla!! Two thousand feet later we encountered a series of drops. Having no rope we exited and packed off to the east. Twelve thousand five hundred foot Cerro de la Luz towered above as we labored up the alpine pass. By noon we crested out at around 10,000 feet elevation. Llano de Caballo was visible below. From there we descended still again into Llano de Conejo. A farmer there showed us a view of la Silleta. From the bearing and estimated distance I calculated that we were within two miles of the hole. To our incredible amazement the farmer said he knew where it was!!

After a restless night in our hammocks we were awakened at 7:00 AM by the farmer who was ready to hit the trail. We were half asleep for the first 30 seconds, at which point we were rapidly roused into reality by his super sonic trail speed. Within 25 minutes we had ascended 1000'+ to Llano de Caballo -- (it took 45 minutes to hike <u>down</u> the day before). The pace continued to a large white cliff which I recognized from the air photos as just above the hole. We could have started a fire with the psyche sparks which were flying off! Fifteen minutes of trail chopping later we were standing on the edge of Hoya de la Luz. With the exception of El Sotano I have not seen a more awsome entrance. Rock times averaged 7-1/2 seconds free. What frustration to have all 3000' of our rope back in the truck!

We packed out that afternoon to El Barrio on the Xilitla-Jalpan highway and camped at the Rio Santa Maria.

The next afternoon was spent in Jalpan savoring Peso snow cones till we noticed this guy breaking into the truck. Much to our surprise it was Tracy who had just arrived by bus for the Nogal push. That night we drove to the end of the La Purisima road and packed up for a ten day, 500 meter or perish trip to San Jose. Fully anticipating the hardships of going deep with only a four man crew we spared no food -- two duffels worth of culinary delights. Two more duffels totalling 2000' of rope completed our burro train which left at dawn the next day. After setting up camp just above the Nogal sink, Tracy, Larry and I descended the "second" entrance to Nogal. Surprizingly it ended in a methane lake 140' down. How did we know it was methane? Tracy says, "We used to do this in Arroyo", and stirs up an immense cloud of gas. Since he was swimming with his lamp on we were treated to a fine 4 foot high fire display with Tracy jumping about in the middle!

That afternoon we sorted ropes for the known drops in Nogal, as that had saved considerable time in Conchas.

By dawn Larry was suffering from a bad case of the 'Zumas and decided to remain in camp. We quickly rigged to the first lunch room, termino of previous exploration, about -800'. Ninety feet below we pendulumed across a deep lake and continued down a flowstone cascade. This was followed shortly by a large drop. Gary descended on a 300' line. This pitch,

dubbed "The 170" quickly led to another deep pitch. One hundred twenty feet below Tracy stopped on a flowstone bridge. From here a 100 foot free drop places one in the second lunch room. This large, silt floored room is about 1350' down. A quick inspection yielded no leads, however a fissure on the side opposite the rope opened into a 40' free drop. From there Gary squeaked through a tight fissure crawl to a 30' drop. We bypassed this via a crawlway and 15' climb to a small chamber. A solution scoured stream passage led off. By this time we had run out of rope and decided to bag further exploration.

The next day we R&R'd it in our hammocks talking to the large crowd of locals who wandered through camp. By dawn all four were psyched to push the crawl. Within 6 hours we were sloshing down the pool floored passage, having surveyed in from the first lunch room. The passage dropped in a series of 10' down climbs to a crawlway. A 30' pitch off the crawlway led to a breakdown room. After some careful consideration concerning the stability of this pile of rubble, which was perched directly over the next pitch, three of us decided it was too risky. Tracy, however felt it was perfectly safe. So to demonstrate its stability he pinged it gingerly with his rock hammer. Three or four pings and a half ton of rock down the pit later we decided it was safe! Tracy's "Reconstruction Alley" droppped 70' to a small room overlooking a vast black chamber. A 75' free drop from there places one on the floor of the immense "Hall of Oztotl." Roughly 150' x 100' and 70'-100' high, it is the largest room in the system. The survey later showed this room to be almost precisely 500 meters below the entrance, and another large drop loomed ahead! Unfortunately, we were out of rope again and getting quite fatigued. Seventeen pitches later we staggered into the surface camp at 4 AM. Upon awaking that afternoon we realized that we had used all our rope in getting to the Hall of Oztotl. So the next morning Tracy and Gary hiked back to the truck for our 900' rope. Larry and I went lead checking to Milpas Viejas (later renamed Milpas Lejos). Sotano de la Calavera, located on the ridge west of Nogal was a miniature Cuesta; a 100' free drop into a 100' diameter room with excellent cave pearls and dual light rays casting sufficient illumination so that lamps were unnecessary.

Six other insignificant caves and pits are located way off on the west ridge above Milpa "Lejos" and are not worth returning to.

Armed with another batch of rope, we went to work on Nogal again. It only took 3 hours to arrive at the Hall of Oztotl. Much to our dismay, the next pitch (80') led to a mud sump. We left the cave rigged for photos and started out. Just above the 30' crawlway pitch was a tight fissure lead. Tracy and I popped through to a 15' down climb. This quickly led to a deep pit. We rigged a 150' rope with a big knot on the end and I dropped in. The pitch goes free, all the way to the Hall of Oztotl, so I ended up dangling 100' off the floor just above the final pitch. This is definitely the easiest way in.

Back on the surface, Roy and Patty greeted us. Don and Shari arrived the next day. While we rested, they tied in the surface survey from Nogal to Conchas.

All descended Nogal the following morning. Don, Shari and Patty took photos down to the 140' drop below the fault room. Roy and I derigged from the bottom to "The 170" where the relief team of Tracy, Larry and Gary took over. Everything was out by 2 AM.

During the following two days we finished up all the odds and ends.

SOTANO DE NOGAL

RANCHO SAN JOSE, QUERETARO, MEXICO

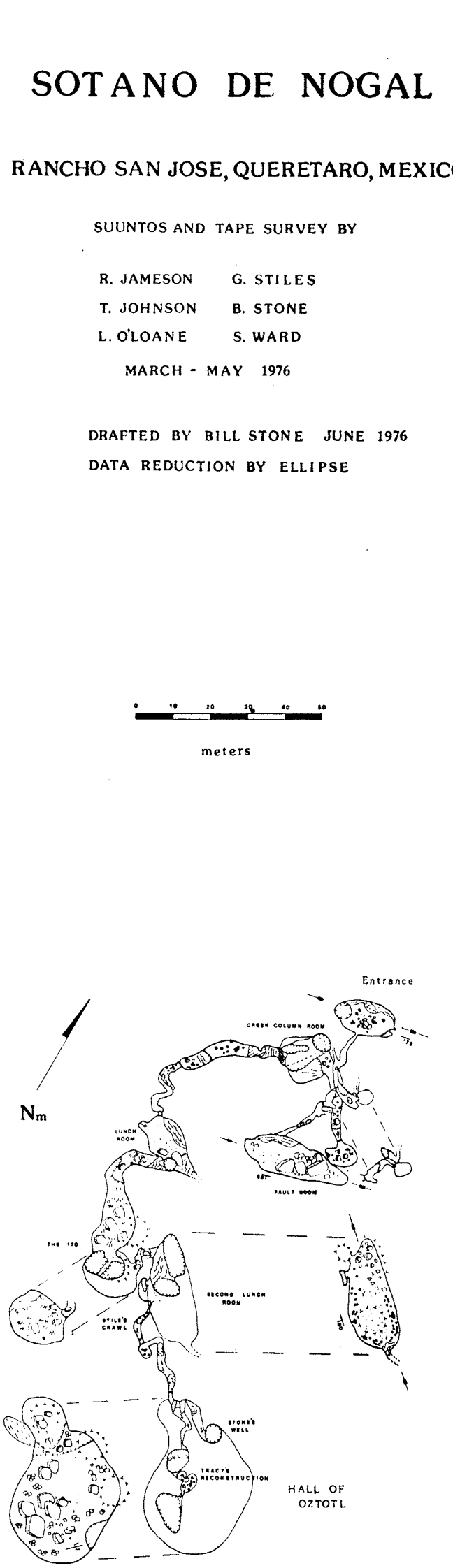
SUUNTOS AND TAPE SURVEY BY

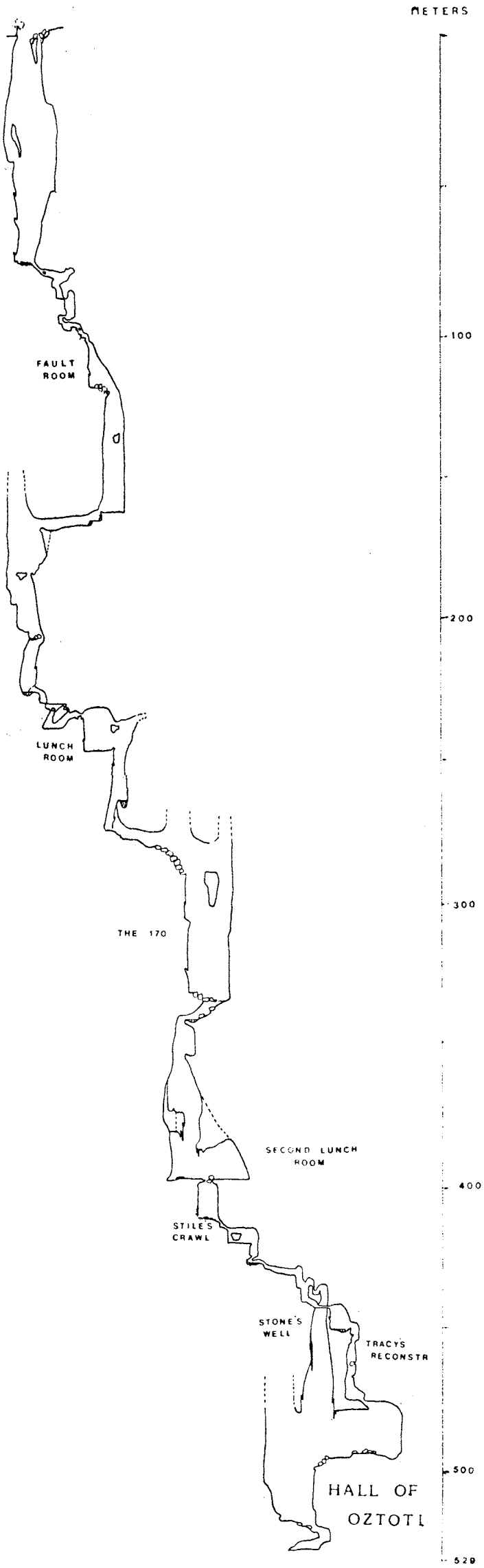
R. JAMESON G. STILES
T. JOHNSON B. STONE
L. O'LOANE S. WARD

MARCH - MAY 1976

DRAFTED BY BILL STONE JUNE 1976
DATA REDUCTION BY ELLIPSE

meters





Roy dropped 3 pits and a cave near camp, the rest checked two big pits in Laguna de la Cruz, the largest about 180' deep. According to the locals a dirt road will also be built to San Jose through Laguna de la Cruz. This will allow one to drive within 100 yards of Nogal.

Tracy and Gary split for Tucson whilst the rest headed for Micos. Jon and Shari left for Austin, and Tom and Louise Strong arrived from Tucson.

Our transformed crew arrived at El Barrio around sunset two days later and made burro arrangements to haul 4 duffels up to Llano de Caballo.

The hike up took only 5 1/2 hours, much to our surprise. Unlike the previous trip, the weather was foul. We chopped a good trail into Hoya de la Luz (follow the orange flags) the following morning and rigged the drop by noon. Larry, Roy and I descended as more clouds lapped in. We then commenced exploring the spooky Land of Luz. It is like no other cave or pit in Mexico. The bottom measures about 600' by 400' and is largely covered by a forest of immense (up to 100' high) trees which shade the leaf covered floor. Large blocks of breakdown are hidden in the trees. A major stream network winds across the floor. The tributaries begin at each of the three large waterfalls which cascade into the pit and culminate in a large siphon pool. There were few leads in this lost world, and those large enough to pass through had ice cold streams dumping in . . . ask Roy! To add to the strangeness, the trees above were coniferious while those below were decidious. The survey took 3 days and included over 2 kilometers of "passage." (We made the long cave list just going around the entrance!) Book work and instrument reading were aided greatly as no carbide lamps were needed!

We surveyed two large horizontal caves in Llano de Caballo during the remaining portion of our 8 day stay on the plateau and are convinced much more remains to be done. An immense cave is reported in Llano de Garza to the north.

So there you have it, Nogal was 529 meters deep with 18 fine pitches. This makes it the third deepest in the hemisphere and believe me it is a subway compared to Conchas. Any ambitious soul could easily make it number <u>two</u> by surveying to the high side of the entrance and digging precisely 13 feet down in the silt sump at the bottom! And Hoya de la Luz? Why it was a rousing 189 meter free drop. It was definitely a fitting way for me to end my last big trip to Mexico (for awhile).

NEWS NEWS NEWS NEWS NEWS NEWS NEWS

Plans are underway to resume publication of the AMCS Newsletter (the real Newsletter). Vol. V. No. 2 is almost ready for the printer. This issue will be afascinating blend of old and new-trip reports from years ago mixed with new information such as the complete never-before-in-print account of the exploration of Sotano de Sauz. This is the cave in northern Mexico explored with blocks of ice to combat the 106 F heat. Publication of the Newsletter will free the Activities Letter from the pressure to publish longer articles. Thus the Activities Letter can be shorter, and more frequent and return to its original format of giving short accounts of recent development and proposed trips.

Xilitla Plateau

June 8 - 15

by Roy Jameson

Participants: Roy Jameson, Patty Mothes, Larry O'Loane, Louise Strong, Tom Strong, Bill Stone

After completing Sotano de Nogal in early June, a return trip was made to the highlands above Xilitla to explore and map the black hole, Hoya de la Luz. At Christmas time 1975 Bill Stone and others had seen a large pit from the air near Cerro de la Luz, a 12,500 foot peak centrally located on the Xilitla plateau. In late May, Larry O'Loane, Gary Stiles, and Bill Stone hiked up from El Balcon (near Xilitla) and located both Hoya de la Luz and the long horizontal Cueva del Llano de los Chiquitos.

On June 8, after a very wet night, camped on the highway above Xilitla at El Barrio, we packed over 1,000 feet of rope and a week's food on a rented burro and began a five hour hike up to Llano de los Caballos, located thirty minutes from Luz. Larry, Tom, Louise, and our Mexican packer, Ambarro Trejo, left early while Patty guarded our packs Bill and I took the Bozo Bus and my honky car to El Balcon for storage. (Future trips should arrange packing at El Barrio, but since the town is located over 300 feet higher than the main road, vehicles are better left at El Balcon. One should also take sufficient water for a 4 to 5 thousand foot climb.) Roughly an hour later we regrouped a thousand feet above the highway at a coke stand, then contoured around the ridge to the east and a small village. Past a narrow gate the trail trends north until reaching a small cemetery, then becomes indistinct and climbs rapidly for several thousand feet. Eventually the trail leveled out, crossed around a large dolina, crossed over another hill, and passed through Llano de Conejo, a large relatively flat dirt floored valley. After passing through another village we checked a sink into which a stream flows, but it was choked with logs and mud. Since a lot of water enters in one larger and several small holes, digging should be undertaken on a future trip. We followed the stream to the western end of the llano, then climbed a horrible trail 1000 feet straight up to Llano de los Caballos. This trail was so bad the burro had to be taken on a different trail by Larry and the packer. About this time it began to sprinkle, and as a cool day got colder we got very strung out. Louise's knee and left ankle began acting up, so we were all glad to reach Llano de los Caballos and pitch camp. The five thousand foot climb to 9,000' (±) had tired everyone, and so we rested for several hours.

In the late afternoon Patty and I headed for Cueva de Campamiento, which had been briefly checked several weeks earlier. The arroyo which winds across most of the llano enters a cliff in the northern end. Bill had reported that a tremendous log jam made exploration past a 30 meter long entrance room unlikely. Armed solely with a flashlight, Patty and I carefully climbed over, around and under five and ten meter long logs and vegetative debris to the end of the room. We quickly opened up a passage 1 meter wide and 1 meter high, which could be entered by squeezing between some rotten and partially charred logs. I chimneyed past a small waterfall and over a lake until a 3 by 4 meter passage opened in front of me. I followed it 30 meters to a climb

which would have been hazardous holding the flashlight and so returned to camp with Patty for proper caving gear. After informing the others of our luck, we returned to Cueva de Campamiento and explored and collected for several hours. The cave is 394 meters long and 24 meters deep, with several large rooms, some good chimneys, a stream with flatworms, and many speleothems. Flowstone and columns abound. One rather strange "hand formation" became everyone's favorite; standing perhaps two and a half meters high, it consists of four stalagmite fingers cemented together and lying horizontal and one upright "arm." I claim it is a foot, but was voted down. The cave terminates in a mud and leaf banked sump, but needs to be rechecked in a drier season.

Patty and I returned to the surface to a heavy downpour. A small stream in the previously dry arroyo was now entering the cave. We waited perhaps 30 minutes until it got higher and we got colder, then removed outer clothes, which were stuffed into packs, and, retaining boots, sprinted a quarter mile across the llano to camp. The llano was extremely wet; puddles joined to other puddles until it seemed the llano were but one huge puddle! At camp we found Bill and Larry, who had no tent, hanging in hammocks under ponchos. not really dry and quite cold. They had been cooking dinner when the rain began, and had to crawl into sleeping bags while in the hammocks when the rain refused to quit. Patty and I, extremely hungry after the day's exertions, had no choice but to jump in our tent and consume several hard boiled eggs without salt. Pots left out had completely filled by morning, prompting an estimate of a six inch rain. We wondered what Cueva de Campamiento would look like the next day and were glad we had left.

In the morning we awoke to the sound of cows chomping on pots and defecating around the dead campfire. Larry demonstrated his talents at dispersing cows (and bulls) by yelling, running and throwing rocks at them. This continued several days. Clothes left out to dry ran the risk of being eaten, like the green shirt of Patty's. My tent stakes were pulled up, and the yellow plastic ground cloth under the tent was pulled out and chewed through without damaging the tent itself! Each day brought a new surprise.

By noon on the 9th we were hiking northwest towards Hoya de la Luz to begin exploration. The weather had improved; instead of rain the sun occasionally peaked out through what began as higher clouds and later ended as fog. Bill, Larry, and I left first and chopped a trail 400 yards long down to the pit. This being the year for rattlesnakes (ref. Conchas and Nogal expeditions) I managed to step on a foot long specimen while carrying half of the six hundred foot bluewater. Fortunately I jumped very little and avoided pulling either Larry or myself down on top of it. The snake was sluggish, but Bill dispatched it to preclude further incident.

Eventually we arrived at the pit and chopped our way to a good tie off point over a karren block at the south east corner of the entrance lip. Patty, Louise and Tom soon arrived with the rest of the rope, so after a quick lunch Bill, Larry and I entered the pit. The others remained above and began chopping around the pit for the lip surface survey.

Hoya de la Luz has a 188 meter entrance drop when rigged from the highest safe point. Another safe drop of 125 meters from the "photographic rock" is also possible. Rigging elsewhere entails rappelling through vegetation and past loose rock. The pit measures 200 by 125 meters and is covered by a forest below. Thick underbrush and leaves almost completely cover breakdown and soil. Along the sides bare breakdown zones appear where waterfalls spray as much as 100 meters downward after rains. Three main waterfalls occur and originate at various levels. The bottom is relatively flat, but at the eastern end a flowstone mound caps an unvegetated breakdown slope and on the western end breakdown slopes along the wall lead to several cave passages. Only one continues past the daylight zone. A set of climbdowns totaling 10 meters ends when a stream disappears in breakdown. From the main waterfall

HOYA DE LA LUZ

Cerro De La Luz
Querétaro, Mexico

TRAVERSE LENGTH 2.2 KILOMETERS

DEPTH 103 METERS

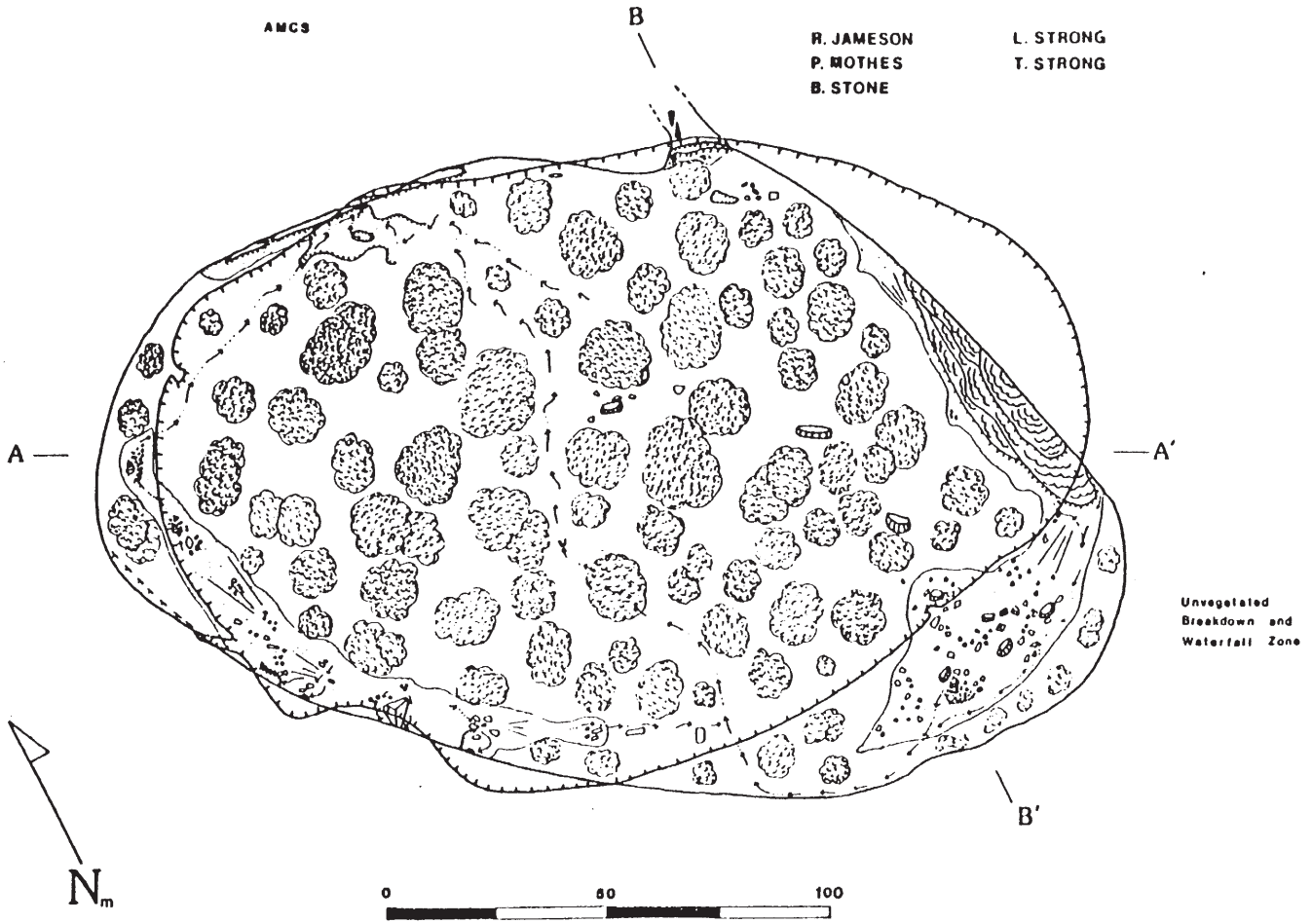
DRAFTED BY ROY JAMESON

AMCS

Suuntos and Tape Survey 9,11,12 June 1976

by

R. JAMESON
P. MOTHES
B. STONE
L. STRONG
T. STRONG



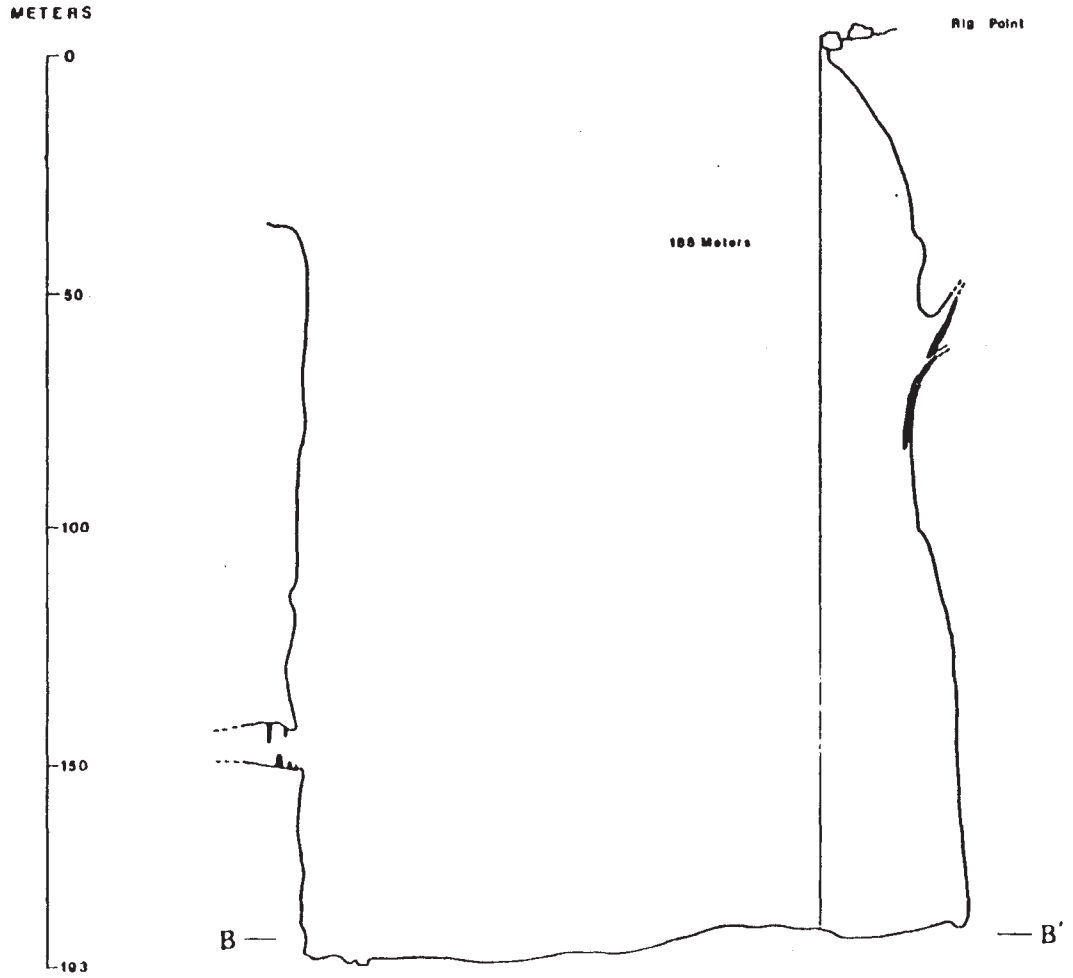
HOYA DE LA LUZ

Profile B-B'

Located by air reconnaissance Dec. 23, 1975.

Ground location May 24, 1976

L. O'loane G. Stiles
B. Stone



near the bottom of the high entrance drop a stream wanders across the center of the pit, (several other stream beds join it) and sinks in mud at the opposite wall. This represents a poor lead, but should be checked when dry. More promising is an unchecked 10 meter wide and 6 meter high passage with large stalagmites located approximately 50 meters off the floor on the north wall. A prominant joint leads up to this entrance from the floor; the lower section of the northeast wall is very straight and leads directly to the entrance. Either a rappell or a long joint climb could be attempted, but both have disadvantages: the rappell would require pendulum swings, and the joint climb might require bolting. No subsidence trench is observed. The pit is formed in massive El Doctor limestone. The top third dips about 20 degrees westward and consists of easily observable beds of several meters thickness. It overlies much thicker beds dipping slightly eastward, but wall deposits and staining make observation of beds in the lower 2/3 difficult.

The pit was eerie and quite wet from the rain. It took several hours to explore the bottom, and when Larry and Bill began tandeming out the rain briefly returned, along with a fog which wafted over the ridge, then sank a third of the way into the pit. I was more fortunate and remained dry.

On June 10 we returned to Cueva de Campamiento and completed exploration and surveyed. The water level in the sump had risen nearly 2 meters.

The next day Larry left for the US while we returned to Luz and surveyed the bottom. Tom took telephoto pictures of the rest of us as we surveyed along the walls and down the streams, tape running in between trees and through water spray. Carbide lamps were unnecessary, which made for quick sightings. Slightly over half of the 2.2 kilometers of surveys were "underground", the rest were made outdoors on a marathon chop around the lip the next day. The terrain is heavily vegetated, and rock hopping makes movement even more difficult.

But to the north terrain was even worse. Karren blocks become high pinnacles, and travel is next to impossible. On June 13, Bill checked a lead located half a mile northwest of Luz among the pinnacles, while the rest of us hunted for Cueva del LLano de los Chiquitos. No one had any luck; Bill nearly fell out of a tree trying to figure out where he was, and we took the wrong trail and ended up miles from our proper destination.

On June 14, we fared only slightly better. Another cave in the Llano de los Caballos is located at the extreme eastern end in a narrow ridge which extends several hundred yards out into the llano. Christened Popcorn Everywhere Cave, or Cueva de Maiz Tostada, it is a single joint cave 190 meters long. The entrance is pleasantly large, but after 40 meters popcorn chimneys and popcorn crawls make for rough going. A lower level passage has cave pearls and bats; the cave ends in a series of muddy crawling rooms with several domes. The survey almost aborted several times due to popcorn lacerations, but in a fit of exasperation, Bill Stone saved the day at the edge of the formation room: he wanted to erect a sign entitled "Oztotl Sucks Cave." And several days of limited food brought on a further witicism: "Oztotl must have been out to lunch when he made this cave." Tired of rain, cows, and popcorn we quickly left the next day for Valles, the Condesa, and Micos.

Exotic Diseases

The August 1976 issue of the TEXAS CAVER contains an article by C.J. Rushin on tropical diseases. Starting with the more common types of diarrhea such as Amoebic and Bacillary the article then discusses the more esoteric diarrheas such as Tropical Spruce, before moving on to cavers personal experiences with fun diseases like chiclero ulcer and beefworms. What every caver needs before leaving for the southern jungle is a practicle lesson on how to pull the bot fly maggots from your body after the peanut butter treatment. If you plan a trip to Southern Mexico or are just interested in the grim details the August TEXAS CAVER can be obtained for 50¢ from Gill Ediger, Editor of the TEXAS CAVER, Box 8424, Austin, Texas 78712.

CB's Illegal in Mexico

You should not take your citizen band radio into Mexico, it might be confiscated. Their operation is illegal in Mexico as they use the same channels as the Mexican police and fire departments, and the Mexican authorities are unhappy with the increasing interferance from Americans operating illegally in Mexico.

Flash: Report is now that Mexico is establishing its own CB bands. Check before you enter Mexico.

$$$

For many years the exchange rate bewteen the Peso and the Dollar has been fixed at 12.50 Pesos to the Dollar. But over the last several years inflation has been more severe in Mexico than in the United States and the 12.50 exchange rate became unrealistic. The Pesos a tourist got for his Dollar would buy less and less and this made a vacation in Mexico very expensive. So to encourage tourists the Mexican Government has allowed the exchange rate to "float" - that is to let the Peso be worth what ever traders are willing to pay for it. This value has recently been fluctuating at about 20 Pesos to the Dollar. The floating rate has one unfortunate side effect - shops and restaurants are less likely to accept Dollars as they don't know what they are worth. To avoid problems keep plenty of Pesos handy. Your Dollar will buy almost twice as much as it would before the Peso was devalued - so now is the time for a visit.

Standardization of Mexican Cave Locations

by Peter Sprouse

The CETENAL 1:50,000 topographic maps rapidly being produced for all of Mexico contain a built-in aid for standardizing cave locations easily and accurately. Each sheet is overlain by the Universal Transverse Mercator Grid System. This metric grid is accurate, easy to use, and used and understood worldwide. Where each grid line intersects the margin of the map is the last three or four digits of a number that indicates the distance in meters north or east of the grid origin. By scaling off from the north and east grid lines the exact UTM coordinates of a point may be determined to the nearest 10 meters. A handy aid in this is the new Army micro-thin protractor which includes a 1000 X 1000 M scale designed for 1:50,000 maps.

For example, the UTM for Sotano de la Joya de Salas is 2562.47N, 469.21E. Its true UTM coordinates are actually longer numbers, these only allow us to locate the cave on its host topographic map. Anyone planning on caving in a mapped area could refer to the Cave Files and plot the coordinates of all caves, leads, etc. on the map, thus virtually eliminating duplication of work.

When working in a mapped area, determine the UTM for each cave, put it in your notebook, put it on the cave map, and notify the AMCS Cave Files. This system has the potential to be easily computerized. Here is an example of the cave location format:

Cave Name: Sotano de la Joya de Salas		State: Tamaulipas
Cetenal Map Number F-14-A-49	UTM North Coord. 2562.47N	UTM East Coord. 469.21E

Russians Gaining in Depth Race

Russian cavers have succeded in exploring the first cave system deeper than a kilometer outside of France. Groups from Kiev and the Crimea reached the terminal sump of KILSI (or KIEVSKAYA) in Sept. 1976 at a depth of -1,080 meters. Discovered in 1973, by 1974 it had been pushed to -520 meters, and to -700 in 1975. It is located on the eastern border of Uzbekistan in the Pamirs-Alay Range at an elevation of 2500 meters. Russian Cavers are government employees who have graduated from a four year "school" of speleology. This may put them in a position to be the world's deepest cavers - but its not time to give up in Mexico yet, even it we do have to pay for it out of our own pockets.

Source: p. Courbon

San Juan Area

Nov 1976

People: Tracy Johnson, Henry Schneiker, Blake Harrison, Jill Dorman, Rov Jameson, John Mall, Mike Whittig, Jeff Horowitz, Preston Forsythe, Alex Cochrane, Bill Stone, Frank Binney

The Bozo Bus crew arrived in La Purisima after a marathon 17 hour drive and teamed up with Henry and Tracy for a week of ridge walking.

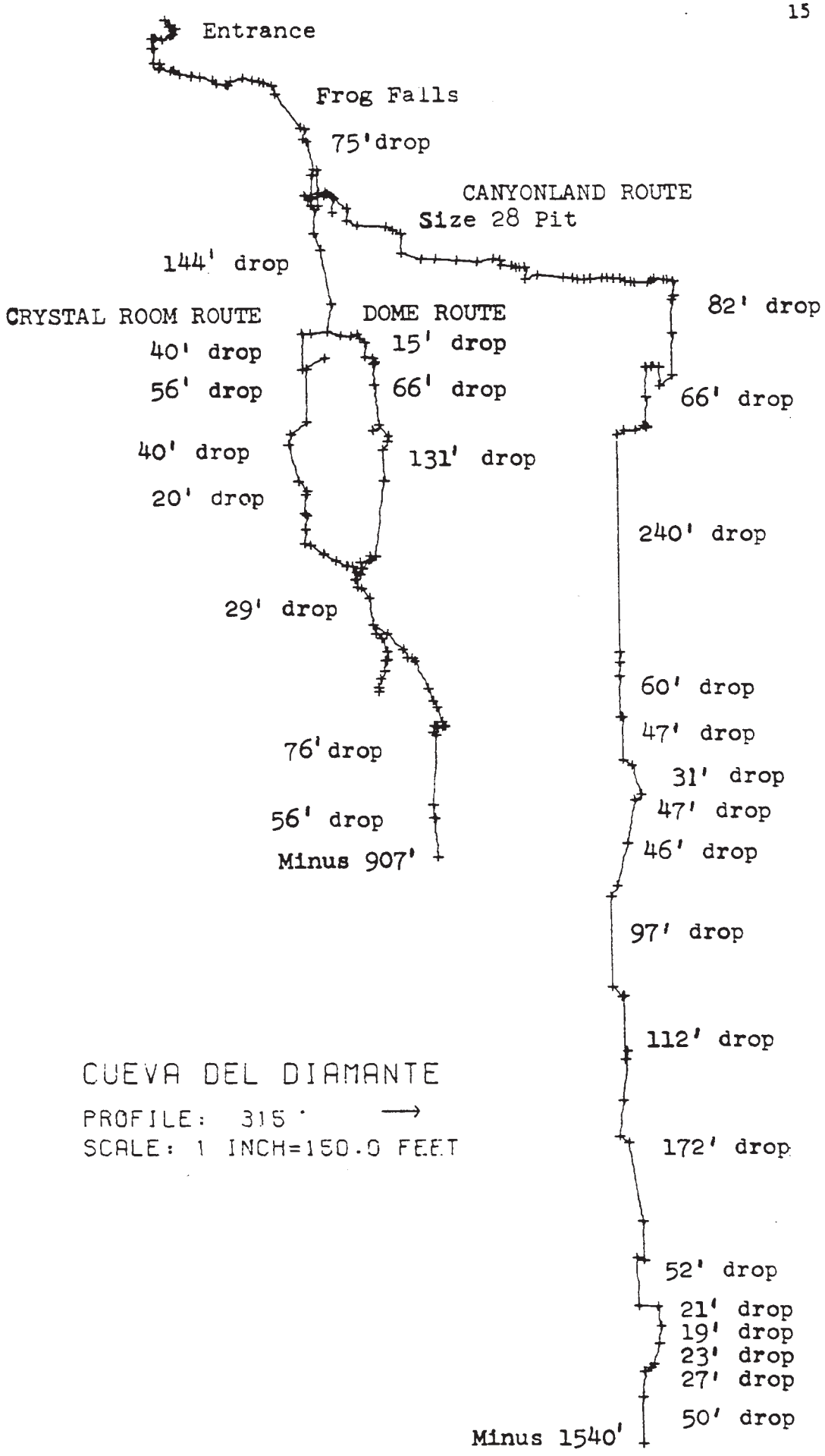
A new road was followed up the west range above La Purisima to Las Tinajas. Although the locals could not have been friendlier there was a lack of promising karst. Several pits (up to 150') were bottomed before we left, but the ambitious hiker may find some good leads in Huilotla, 2 hours west of Tinajas.

In the first attempt at 4 wheeling, east of Conca, we lost a full day as we mud lucked our way from Arroyo Seco to Lagunillas (40km). This area is a raised volcanic plain and has dubious caving potential. Returning to Conca via El Rayon and Rio Verde we found yet another new 4wd road going east from Conca. This one took us over half way up the mountain before stopping abruptly. We packed up for a 5 day trip, hiked up and set up camp at Agua Fria, south of Tierras Prietas and directly above El Sabinito - the road will connect all three when finished. During the next 3 days many clogged arroyo entrances were found. Hours of futile digging and squirming yielded little. The two most promising pits found were not even descended, both near the south edge of the range. Frank free climbed one for 60 feet but we ran out of handline. The other was roughly 30 feet in diameter and well over 200 feet deep. Though it appears to take no water, it is situated at the edge of the 2000'+ Santa Maria Gorge and might go.

On the last day of scouting we decided to do some long range hiking. Tracy and Henry left for Tucson, Preston, John and I headed north and the rest went south east. As always seems to be the case, the best leads come when you have to leave. Roughly 5 miles north of camp we descended into a series of fascinating karst features. Large streams appearing and sinking in the same doline through grass sumps. But the largest doline didn't sump. Viewed from a distance the sink is about 1kilometer long and half as wide - perhaps a 100 meter deep lip on the valley side and the towering mountain forming the high side. A 7 meter wide stream meandered across the floor and disappeared into a spectacular 30 meter high head wall of El Doctor limestone at one end. Preston and I fired up our lamps and headed in. Five solution scoured free climbs (a bit hairy) led to a 20 meter free drop with the stream dropping in. Definitely a going system! On the way out Preston dislodged a key rock holding back a pool covered with 2" of vampire guano. As I was in the middle of a sporting free climb at the time there was no escape from the surprise falls. Grim.

Upon returning to camp the others recounted almost losing Rov to a rock slide at a promising dig. All in all not a bad scouting trip. The arroyo cave to the north is called Cueva de la Pena and ironically has a spectacular view of Lagunillas and the volcanic plain to the east. If the cave goes that way it might bottom at less than 500m - but if it goes west, with all that water . . . .?

Bill Stone



CUEVA DEL DIAMANTE

PROFILE: 315° ⟶

SCALE: 1 INCH=150.0 FEET

Caving in Puebla, Vera Cruz, and Oaxaca

Andy Grubbs, David McKenzie, James Reddell and Carmen Soileau left Austin on the 15th of December anddrove directly to the Cuetzalan, Puebla area, about 90km NW of Jalapa. Coincidentally running into the Lords (Peter and Sue along with Peter Sprouse and Terri Treacy) who were arriving to follow up on their recent discovery of a large section of cave joining Sima Esteban with Grutas de Guayateno, as well as several pits. The combined group discovered nearly 20 new caves, including several sumideros. After the Lords left, the group mapped about a mile in a new cave, Cueva de Tasalolpan and collected a troglobitic tarantula. Moving on to a volcanic area near Jalapa, they investigated a lead from a 1904 treatise on bats, which led them to the 200m long lava tube Cueva de Infiernillo. Also visited was Grutas de Camposantos, a large one room bat cave.

Next they drove south to Acatlan, Oaxaca, where they surveyed nearly 2km in Cueva de Maravillas, leaving only small side leads. Many biological finds were made, including a new highly cave adapted catfish, about 6 inches long with a thin ribbon tail. Moving north to Cuitlañuac, Veracruz, east of Cordoba, they found three caves with large streams in them, none of which were completely explored. In one of these caves, Cueva de Sala Seca, the upstream passage, 20 feet wide and 20 feet high, could not be checked, as the current was too swift to swim against. Also visited was the nearby Atoyac area, as well as an area near Orizaba. Here they pushed Cueva de Macinga for 150m through a 63°F stream to a terminal siphon.

On the way back to Texas the group stopped by Cueva de Cuartels in the Sierra Tamaulipas. This cave has about 2km of large passage and is currently being heavily mined for phosphate. The trip lasted 30 days, 38 caves were visited and about 5km of passage mapped.

A. Grubbs, B. Russell, & P. Sprouse

CUEVA DE DIAMANTE

Mark Minton, Richard Minton, Harold Goldstein, Barbara Vinson, Neal Morris, Maxine Miller, Ron Tilkens, John Ferguson, Tom Shifflett, and Cady Soukup returned during the holidays to Cueva de Diamonte. This cave is located on the crest of the Sierra de El Abra about 50km North of Cd. Valles, S.L.P. The small entrance to this cave had been discovered in 1974, soon after the road to the nearby Otate Mine was completed. The Minton-Goldstein crew has pushed the cave through a long narrow canyon to a deep pit at about -500 feet. Reaching this point with rope was difficult as the high narrow canyon was, in places, less than one foot wide and rope had to be passed along through the tight places. The pit at the end of the canyon was a 300 foot drop immediately followed by drops of 50', 30', 45', 45' a 10' climb down, a 100' free drop, a 130', then a 180' broken by a ledge a 55' drop, a 20' drop, a 15' climb down to a 50' drop where they ran out of rope. Looking down this pit they could see the black entrance of the next drop. At this point survey was at -1534 feet (468m), and a branch passage also ended in an unclimbable pit. Over 600 man hours were spent on this cave with 2050 feet of rope in the cave, the derigging trip taking over 24 hours. They didn't have enough rope for Diamonte as they thought the range was only 1500 feet high. Apparently, the range is somewhat higher and the entrance to Diamonte could be as much as 1800 feet above the water level. Some time was spent looking for new caves nearby. Two new pits were explored; an archeological cave was explored to -800 feet in a series of drops and another pit found by Cady had a 91 foot entrance drop to a slope ending in a 410 foot pitch.

Bill Russell

The Joya de Salas ... A Mystery Unsolved

The exploration of El Sotano de la Joya de Salas was begun by AMCS members in 1965 - yet 12 years later the cave has still not been bottomed. The recent AMCS success in Sotano de San Agustin encourages us to take a close look at the Joya's possibilities.

September, 1973: A group of six Canadian, English and Texas cavers failed to pass the rimstone barriers that stopped exploration at -1,234 feet. On the way out Peter Lord and Blake Harrison stopped to check a lead that goes back underneath the drop that is just below the Angostura de Linda. A narrow, but interesting passage, Peter pushed on through a squeeze while Blake stayed behind. The passage dropped steadily down climb-downs to a point where Peter estimated that he was nearing the level of the deepest portion of the cave. He was in a low water passage that ended in a rimstone dam that came to within about 8 inches from the ceiling. Beyond, Peter looked into a large rift passage running at right angles to the passage- he was in a "T" junction. There were absolutely no rocks to be found, but by splashing water over the dam Peter estimated it was about a 70 foot drop to the bottom of the rift. The dam is rotten flowstone and could quickly be chipped away with a hammer.

Joya de Salas drains over 100 km^2 of land area. Past the Sima Terrible (-800 ft level) the passage becomes constricted and finally sumps at -1234 ft. It seems unlikely that the whole volume of water entering the cave goes this way. Perhaps the rift passage will put us back on the route to the resurgence.

No cavers have been to the Joya since the CETENAL sheet came out. These new maps now rule out the possibility of a resurgence to the west, leaving the Nacimiento del Rio Sabinas as the only likely outlet - 1,400 meters below. Also the map shows several unvisited dolinas 1.5 km S.E. of Joya that look very promising.

Peter Sprouse

Isthmus of Tehuantepec

Dec. 27-Jan. 6

Don Broussard and David Honea investigated an uninhabited region in the State of Oaxaca, lying northeast of Juchitan de Zaragoza, looking for caves. The area was rumored to have limestone and some cave potential. A few caves were found but were mainly horizontal and did not seem very promising. The only access is by backpacking and the limestone area is at least two to three days hike from any vehicular transportation.

David Honea

RETURN TO HUAUTLA

With the 1976-77 Christmas season, AMCS cavers have ended their six-year moratorium on caving in the Huautla, Oaxaca karst region. Four and one half weeks' caving by several groups deepened the recordholding Sotano de San Agustin to -766m and La Grieta ("The Fissure") to -420m. Since the decline in local relations in 1970, at least two Mexican caving groups have visited Sotano de San Agustin as did a group of French-Canadian cavers in December, 1975. Neither of these groups have apparently undertaken any surveying in the area. By 1976 several Americans were planning trips to Huautla. Richard Schrieber was on the 1968 trip that bottomed San Agustin and remembered doubts about whether or not the cave was really completed (see Canadian Caver No. 3). Bill Stone wanted to push La Grieta (which had only been explored down a few drops) and back up Schrieber's group if they succeeded in finding new passage in San Agustin.

"For months we thought about San Agustin. Fantastic fissure. Pounding waterfalls. Beautifully banded walls. Swinging from ledge to ledge. 3000+ feet potential depth. Still going...." John Fish, Canadian Caver #3, 1970.

On Dec. 15, Schrieber's van carrying Don Broussard (TX), E.T. Davis (GA), Steve Knutson (KY), Phil Odell (KY), Richard Schrieber (GA), Jim Smith (GA), and Mark Stock (TN) arrived in Huautla and they immediately rented a house. This group entered a trunk passage in the lower part of San Agustin and bypassed a breakdown choke, entering virgin cave beyond. The new section of cave dropped downward with an increasing amount of water, and they surveyed in several trips from the entrance to a depth of -648m before turning back. As the group prepared to leave, Bill Stone's truck arrived from Austin carrying Frank Binney (TX), Alexia Cochrane (IL), Jeff Horowitz (TX), Roy Jameson (TX), Patty Mothes (TX), and Bill Stone (TX). They decided to continue the survey of San Agustin and Jim Smith decided to join them, while the remainder headed back to the U.S. in Richard's van. The new group pushed the ever deepening stream passage, (sometimes measuring 30X30m), from a 103 hour camp at the -530m level, surveying to a depth of -766m. The furthest point of penetration was to about the -800m level, where two waterfalls funnel down a drop with a combined volume of 30 cubic feet per second. Activities also focused on La Grieta (The Fissure), which is higher and several kilometers away from the San Agustin dolina. La Grieta was surveyed to a depth of -420m despite severe problems with the local Indians - several confrontations and rope-cutting incidents ocurred before a tenuous agreement was reached with the authorities in Plan Carlota (apparently the municipality that governs La Grieta). Arriving to augment the cavers at various times were Jill Dorman (TX), Blake Harrison (TX), Tracy Johnson (AZ), Sheila Johnson (AZ), Dave Kramer (AZ), Tom Patterson (TX), Gary Stiles (AZ), and Dan Watson (TX).

Nevertheless, even if the boulder choke is forced, it is not likely that any significant depth will be added to the cave. John Fish, Canadian Caver #3, 1970

An unusual find during the expedition was the discovery of "Deer Cave", a multi-drop cave consisting of four drops (Max. 20m) ending in a mud-floored room. This room contains many complete skeletons of what appear to be deer, along with well defined tracks in the mud. Some of the skeletons were flowstone-encrusted and were present at the bases of all the upper pitches as well. No evidence of human involvement was observed, nor did it appear possible that the deer had any possible means to exit. No suggestions of a paleo entrance were present.

All in all, the work accomplished in Huautla was very successful. A new Western Hemisphere Depth Record was set at -760m. For the first time the goal of a kilometer deep cave in Mexico is within reach. The maximum depth potential for San Agustin is reckoned to be about 1,200m with another 250m more possible from connections with higher caves. Unfortunately the first and second efforts in San Agustin were not able to join forces in a single push as was hoped for - a combined team could have bottomed the cave. Public relations in the Huautla region as a whole have not changed as much as was hoped. Although the officials in Huautla itself were receptive to cavers and there is no longer a military roadblock at Teotitlan del Camino, the local inhabitants still have little tolerance for outsiders and especially consider Gringos fair game for extortion and harrassment. Only with impeccable credentials, a strong public relations drive, and lots of patience can a continuing effort succeed. An AMCS expedition is planned for this Spring.

+900m in Canada ?!!

Rumors have reached our ears of a very deep cave on Vancouver Island, Canada. "D.C.G. Cave" has reportedly been explored upwards from the entrance to +900 meters. We are attempting to verify this and will hopefully have accurate details in the next Activities Letter.

Source: Paul Courbon

First report from local cavers is that this cave might be D-6 or QMS Cave (for Quatsino Master System), but that they have not heard of any exploration to depths (or hights) of anywhere near 900m.

Cueva de Brinco

Over the Thanksgiving holidays a large group of Austin cavers went to Cueva del Brinco, 8 hours by 4wd roads N.W. of Cd. Victoria, Tamps. On Saturday, November 27, Sheila Balsden, Bon Broussard, Andy Grubbs, David Honea, Janet Honea, Peter Sprouse and Terri Treacy formed two survey teams to map up the waterfall passage at the end of the main trunk and into the new area discovered on the May 1976 trip, while others took photos in the helictite passage. At a major junction beyond the waterfall Sprouse's team went left, and beyond where the passage supposedly ended discovered a major stream passage which was explored for 80m and continues as a 4m diameter, stream passage going down the dip-(2 cfs). Wetsuits are needed for further progress. Don's team surveyed the right hand passage but stopped mapping before reaching the point where Neal Morris had reported a large passage sloping downdip.

The next day (Nov. 28), Sheila, David and Peter started a "short" survey off the bottom of the Traverse Pit. This led through a guano area to a lower vadose passage which steadily dropped until intersecting an unusual phreatic tube 60m long (dubbed "Silvertip Boulevard"). One end of the tube pinched to a reasonable digging lead while the other end intersected another stream passage - the fourth stream. The cavers surveyed down a long, steeply sloping canyon passage to a point where the stream (trickle) was lost through a small hole. Poking around for a while produced a passage which rejoined the stream at what was named Eternity Junction, the end of the survey. This point is 533 feet below the entrance and is currently the deepest point in the cave. All in all, Brinco is now well over a mile long and has several passages going well.

Peter Sprouse

SCHOOL BUS SCOOPS ZOQUITLAN AREA

People: Jim Rodemaker, Loretta Poer, Freddie Poer, Pete Strickland, Preston Forsythe, Shari Larason, Bill Mayne, Gilbert Pena, Barbara MacLeod, Lisa Wilk, Graham Jordan, Maxine Miller.

The Kirkwood 4WD caver school bus left Austin with 12 people and drove via Cd. Valles to Acatlan in extreme Northern Oaxaca. Members of the group made a detailed map of the Burial Chamber in Cueva de Culebra, and then joined with Bob Thrun and the Lord's to map almost a mile in Cueva de la Finca near Laguna Verde. They checked Cueva de Caballo - (this cave has Indian handprints and reportedly also a painted horse - hence the name). On the hill above this cave was a pit tentively named Sotano Bonito with the largest room yet found in the area, estimated at 300x500 feet. After New Years they drove to Zoquitlan, Puebla about 30km north of Huautla, Oaxaca. This town is situated on the edge of a karst area just east of the crest of the high range that borders the coastal plain north of Huautla. On the first day in the area the school bus crew (now reduced to seven) walked to the west and found a promising area of closed vallevs. They camped here the next day and were barelv able to enter two large steeply dropping river caves. The first cave, Cueva del Rio Texocotla, had an entrance 50 feet wide and 20 feet high, and they were able to follow this cave down two drops before they would have to get very wet to continue. In the next dolina was Sotano del Rio Coyo Mealpa with a 175 foot entrance drop. They rappelled down to a ledge where the drop narrowed and spray filled the shaft. It was decided to return with wet suits. The next promising cave, Cueva de Coyomeapan was located upstream along the Rio Coyomealpa. The entrance to the cave was only four feet above the river level and was scoured clean by floodwaters that frequentlv enter the cave. They were able to follow this cave down 5 drops of 30 to 50 feet to where the cave picked up some water at an 80 foot drop and it was decided to postpone exploration.

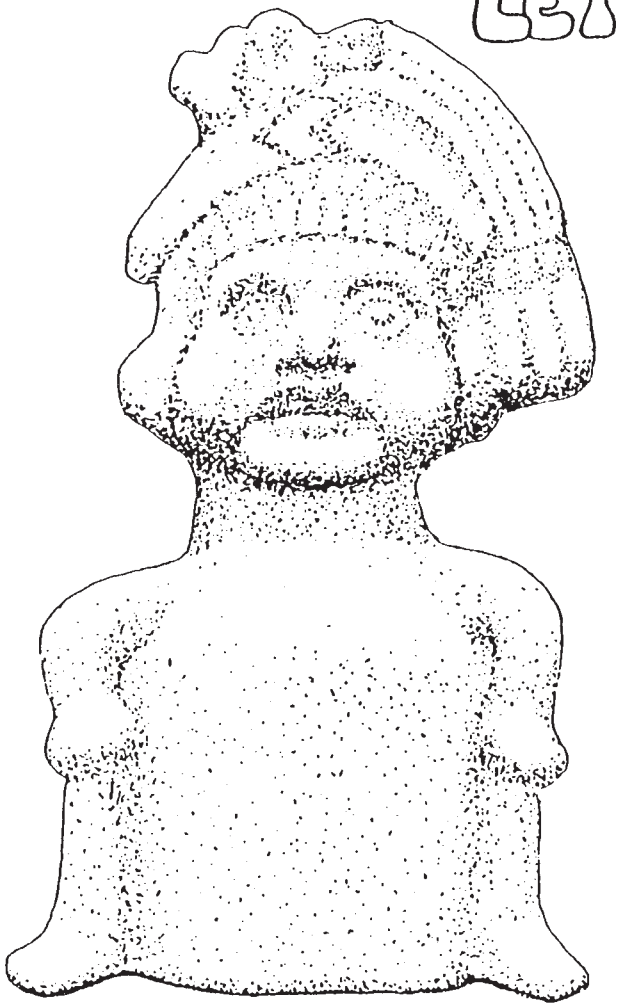
The Zoquitlan area appears to be a promising karst area as the rivers sink in the pine trees and could, if conditions are right, go almost to sea level.

Bill Russell

editorial

Sotano de San Agustin has been pushed to -2500 feet, and several new caves have been discovered to the north of Huautla that may go even deeper. Mexican caving has reached the point where the resources and orginazation required to fully explore these caves exceeds the present capabilities of the AMCS. To sucessfully engage in World Class caving the organizational level of the AMCS will have to be considerably augmented.

AMCS ACTIVITIES LETTER #5

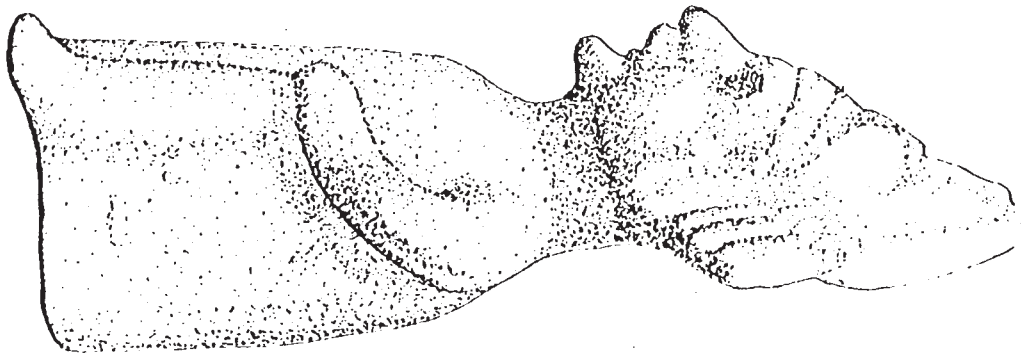


Back Cover

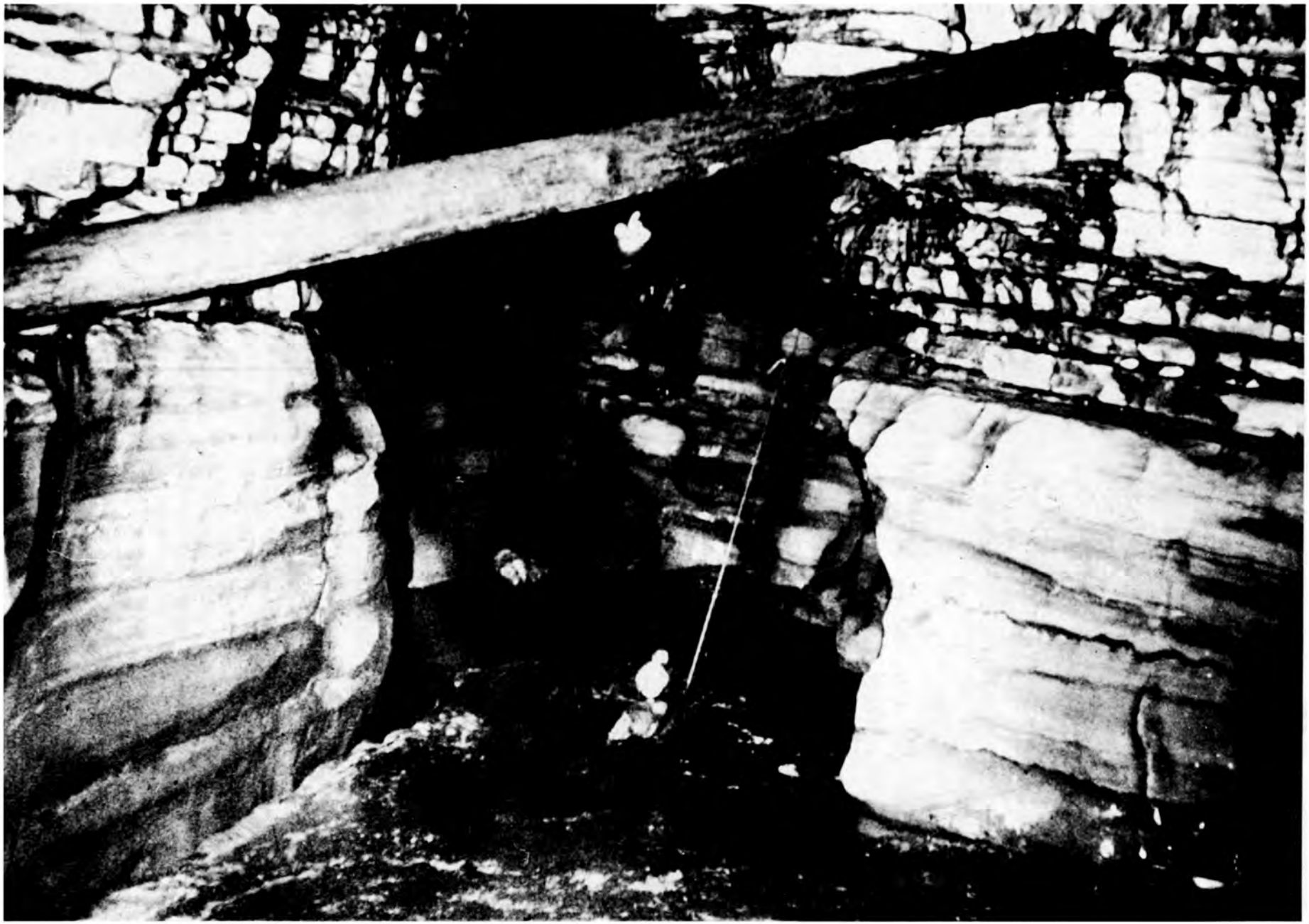
Life size drawing by George Nelson of a small figurine found in a cave in southern Mexico. Drawn from a slide, figurine was not removed from cave.

Front Cover

Looking out the entrance to Hoya de La Luz



AMCS



AMCS ACTIVITIES LETTER

Edited by Bill Russell

LETTER No. 6 **MAY 1977**

Issue Staff: PAT BITTINGER, TERRI TREACY, JANET HONEA, DAVID HONEA, BILL STONE, BILL STEELE, PETER SPROUSE

HUAUTLA ISSUE

This sixth Activities Letter features accounts of the exploration of caves in the Huautla,Oaxaca, area in southern Mexico. This area has some of the most challenging caves in North America. Here the natural hazards of the underground are accentuated by the clash of cultures on the surface. The Huautla area was first located through a search of the 1:100,000 topographic maps of Mexico when they were received by The University of Texas Geography Department. While no individual caves could be located, the area was obviously a karst area of high cave potential.

A reconnaissance trip by Bill Russell, Tom McGarrigle, and John Kreidler indicated the area was promising and on a return trip with more Austin cavers they drove through Huautla to San Miguel and asked a local if the large closed valley below town had a cave at the bottom. He said, "Yes, all of the water goes into a sotano." Hearing this, four of us raced down the side of the dolina. It must have been a strange sight -- four gringos in rain coats running full tilt down through the corn fields. Upon seeing anyone we would yell "Sotano?" and point downhill. The answer was always yes. Within the next four hours we located the entrances of three of the deepest caves in North America — but to realize this depth took years of effort by cavers from around the world.

FRONT COVER
Pool above Fool's Falls in Sumadero Yochib. Photo by Blake Harrison.

BACK COVER
Drawing by Dino Lowery entitled "Caver Beware."This lair belongs to the Indian gods. Indians dressed in this manner should be approached with caution.

The cover photo on Letter Number 5 -- looking out of Hoya de La Luz -- was taken by Roy Jameson. Photo credits were unfortunately omitted. Apologies to Roy and thanks for the fine photograph.

ASSOCIATION FOR MEXICAN CAVE STUDIES

April 1, 1977, marks the 10th anniversary of the first descent into the Sotano de las Golondrinas, Aquismon, San Luis Potosi, Mexico. On April 1, 1967, T.R. Evans was the first person to rappel into Sotano de las Golondrinas and set foot on the bottom of the world's most spectacular free fall pit. The members of the Association for Mexican Cave Studies would like to take this opportunity to both recognize the many hours of effort that T.R. Evans has done in Mexican caving and to express our gratitude to T.R. for his instrumental part in making Mexican caving what it is today.

The discovery and descent of Sotano de las Golondrinas meant much more than breaking the depth record for a free fall pit at that time. It marked the emergence into the world scene of the Austin caving community. Golondrinas still has the longest known free drop; but, more importantly, its overwhelming impact makes it the focal point for deep pit caving in Mexico.

Now, looking back ten years, it seems clear that the strides made in caving in the last decade have been due in large part to the quality and strength of the foundations laid down by T.R. Evans and the many others who created the AMCS. The integrity of their speleology and publications, the exuberence of their caving, and their constant vigilance for safety should be a guiding force and inspiration for the future.

On the eve of another promising decade, it is hoped that all cavers will strengthen their mutual bonds and realize their common goals. Much of the world looks to the AMCS for the standard by which to measure its progress in caving. We must reflect that trust in the quality and integrity of the work that is done.

David Honea Peter Sprouse
Janet Honea Terri Treacy

THE FIRST DESCENT OF SOTANO DE LAS GOLONDRINAS

by Bill Deane

In December, 1966, T.R. Evans, Randy Sterns, and Charles Borland hiked up into the mountains west of the small town of Aquismon in Mexico to investigate the area for its caving potential. They followed a well-traveled mule trail leading to the town of Tamapatz. While on the way, Indians told them of a deep pit with many birds living in it. It was called the Sotano de las Golondrinas.

Arriving at the awesome entrance, the three cavers were stunned when they found that a rock dropped into the pit took more than ten seconds to reach bottom. This indicated a depth of over 800 feet. The pit was not entered at this time due to the lack of a long enough rope.

The morning of March 31, 1967, found twelve of us arriving in Aquismon. Squire Lewis and Nancy Walters had come down from Pennsylvania and had given me a ride from Austin. T.R. Evans, Jon Morse, Sid West, and Bob Hugill had come from Maryland; Bill Cuddington, John and Sandy Cole, and Dan Hale had come from Alabama. Sandino Techo, a friend of the Coles, had come up from Xilitla, Mexico.

Soon we were packed and began the hike. It is only 15 kilometers from Aquismon to the Sotano. However, we found the going to be slow due to the heat. That evening, the twelve of us gathered at the edge of the Sotano. Words cannot fully describe the impressive entrance. It is an immense hole descending into nothingness surrounded by jungle.

Squire took out his railroad watch and began timing the large rocks we were dropping into the pit. It was amazing to watch them fall and fall and fall. Then we would hear a distant boom as they hit bottom and Squire would announce "11-1/2 seconds." This was rather amusing since T.R. had told us it was a 10-second drop. This extra 1-1/2 seconds meant that the pit was 200 to 300 feet deeper than the 800 feet we had expected.

Arising early the next morning we began our preparations for the descent. Our main task was to rig the rope into the pit. Bill Cuddington had brought his 1180-foot section of one-half inch diameter Samson, 2 in 1, Nylon Braid Rope. Braided, the rope was about 40 feet long and 7 inches in diameter. It looked like a giant white python. We carefully unbraided it and laid it around the edge of the pit and secured the other end to a 70 foot rope wrapped twice around a limestone outcropping. The operation required most of the morning. We could see that the rope touched bottom. We knew that 1165 feet of rope was actually hanging in the pit.

Since it was the efforts of T.R. that led to the discovery, he had the honor of being the first down. T.R. put on his rappelling equipment and sat by the edge. Bill and John pulled up several feet of rope to create slack so he could rig on and ease over the edge. Great care was needed since the weight of the rope, 65 pounds, made it very awkward to handle. Once over the edge, T.R. arranged his pack and began the rappel. He carried one of the walkie-talkies with him, but we had agreed beforehand that except for emergencies there would be no radio contact until he was on bottom. About 20 feet down, he pushed aside a small tree limb. This was the last thing he was to touch besides the rope for the rest of the rappel. From there on, the walls continually recede away as you go down. When you land on bottom, the nearest wall is 200 feet away.

Our proceedings had been watched very quietly by about 20 Indians. The Sotano had been a common feature of their lives and I doubt if they had ever considered that someday someone would go down it.

The minutes passed slowly. I kept myself busy photographing the descent. It was fantastic watching T.R. disappear into the blackness below. Finally after 30 minutes we could see that he had reached bottom. A few more minutes passed while he derigged. Then came the radio call we were waiting for. A very astonished T.R. informed us, "You won't believe the size of this place!" After giving us a brief description of the bottom, he began walking around looking for leads.

In June, a second AMCS team conducted the plane table survey. They found that the minimum possible drop happened to be where we had rigged the second rope and was 1094 feet. It was a 1098 foot drop where we had rigged the first rope. This broke, by 64 feet, the existing world's record held by the Lepineux entrance of the Gouffre de la Pierre St. Martin in France. Mexico had produced her first world's record.

(Excerpted from NSS NEWS, Vol. 26, No. 3, March, 1968. by David Honea. Reprinted from the UTG Vol. 8, No. 2)

TRIP REPORTS

Destination: Cueva del Brinco, Tamaulipas
Date: March 11-20
Persons: Jerry Atkinson, Sheila Balsdon, Gill Ediger, Robert Hemperly, Katy Knighton, Thomas Moore, Peter Sprouse, and Terri Treacy
Reported by: Peter Sprouse

Our purpose on this trip was to push the leads left in Brinco from the previous Thanksgiving trip (see AMCS Activities Letter #5). With the height of the dry season approaching, we hoped for some good caving. Crossing at Brownsville Friday night was easy, except for finding our way through Matamoros, that is! We pulled into Victoria in the morning (March 12) for breakfast and headed north to Barretal for the long grind into the mountains. We made it up to Conrado Castillo in a quick 5 1/2 hours from the highway.

After morning R&R on March 13, two teams entered Brinco. Thomas, Robert, Jerry, and Katy headed to the area past the waterfall. They pushed upstream from the Laguna Verde Cutoff and explored several hundred meters of new passage. Trash in the streamway hinted of another entrance but if so the cavers stopped before reaching it. On the way back, they took a wrong turn, accidently discovering a new and bigger streamway! They explored down this until Katy took a 3 meter fall into a deep pool. She was unhurt but shaken, having lost her helmet (poor chinstrap) and light into the 4 meter deep pool. Meanwhile, Terri, Sheila, and I continued the survey from Eternity Junction, the cave's deepest point at -162 meters. Our survey ended at -179 meters where we encountered sump mud all over the walls in the dead end Pig Wallow. We wrapped up leads on the way out.

The next day was pretty much an R&R day. In the afternoon Terri and I sketch-mapped and partially explored Cueva X, a higher, vadose cave which may connect with Brinco. On March 15, caving spirit ran high in camp as Ediger, Jerry, and Robert prepared for a survey trip upstream from the Laguna Verde Cutoff. Sheila, Terri, Thomas, and I set off to explore the entrance in town discovered the previous trip. The first team mapped over 300 meters upstream (but not the downstream way where Katy fell) to a point only 15 meters lower than the entrance. This continues and could add depth to the top of the cave when surveyed. Our team found that the arroyo cave in town had a quick end in dirt and debris fill, so we decided to enter Brinco (sans Terri) to survey from the Laguna Verde, the best lead. This is a place where a low crawl leads to a waterfall room with a stream (the Rio Verde) passage taking off; it had 2 cfs flow in November but only a garden hose's flow in March. We mapped 40 stations downstream through well-decorated passage with deep green pools, dropping steadily. I explored on past the end of the survey to a narrow squeeze with a goodly breeze going into it. The next day our same team, plus Robert, returned to the Rio Verde. We surveyed down to a constriction which had to be enlarged with a rock to allow passage. I explored on alone through a sharp, swiss-cheesy area. Soon I noticed it was different than up to that point: the water, flowstone, and air movement were missing. So I backtracked until I found a small hole going in the proper direction. This dropped down several climbdowns to a low rimstone area. Following the air I entered a low pool which I never reached the end of. Five to ten meters wide and with water often over my head, I followed The Canal for nearly 200

meters to where the ceiling narrowed in a constriction that threatened to blow out my light with its howling gale. Ahead in the distance was the powerful roar of a great waterfall. Returning to the others we decided to map down to the beginning of The Canal and then quit for the day. Our last station was 180 meters below the entrance, making this new section the deepest portion of the cave.

The following day, March 17, was to be our last day of caving in Brinco. Ediger, Robert, and Jerry set off to try to connect their downstream passage (Katy Fells) with the Laguna Verde, while Terri, Sheila, and I returned to try to survey The Canal. Ediger's survey party mapped 26 stations to a point which turned out to be close to Laguna Verde, but a connection remains to be realized. Beyond the last station, it was dropping down and heading in the right direction. For our group, The Canal was a cold survey. Even in wetsuits we were shivering. At the constriction where I had stopped, our lights did get blown out as we surveyed and swam through. But strangely enough, once on the other side the roar of the impending waterfall was suddenly behind us! What had sounded exactly like the roar of a distant waterfall was actually the wind in the constriction. A few shots later The Canal ended in a blank wall with the only way on being up. We ended the survey and explored ahead, Sheila and Terri checking one passage while I took another. Soon we joined up again, with the others reporting having passed several side leads. Although the passage was still climbing, it still seemed like downstream. Soon I left the others behind, running down virgin passage following the air flow. Finally ahead I could hear the sound of echoing water-not wind this time! Continuing on, I entered a room with a stream, the largest in the cave and scoured clean and wet to the ceiling! After looking a short ways to the right and left, I returned and met the others a short way back. Together we explored left in the trunk, the direction of the water and air flow. We went for over 100 meters to where swimming was once again unavoidable. Upstream also led to swimming. We dubbed this new section "The World Beyond" so unlike the old cave it was. We left the cave with shredded hands and wetsuits.

We had a leusure journey back to Texas, stopping on the way at El Chorrito, where thousands of Christian pilgrims had gathered in a festival to worship the Virgin who had appeared in travertine in the cave.

So Cueva del Brinco continues to yield amazing discoveries. In four days of caving we had extended the cave's length from 2.1 kilometers to 3.2 kilometers (making it the 12th longest cave in Mexico) and also increased its depth. Take the air and water flow, add in the likely resurgence 1400 meters lower and I think you can say that Brinco is just beginning.

ATEA RIVER CAVE PUSHED - An Australian expedition to New Guinea led by Mexico veterans Julia James and Neil Montgomery in summer 1976 found fossil passages connecting into the river system, enabling them to survey 2-1/2 miles of the cave. The river passage itself was explored for half a mile but it still continues.

PERUVIAN EXTENSION - A French expedition to the Tarma area of Peru has succeeded in pushing the siphon in Huagapo Cave (see Canadian Caver). They discovered 200m of new passage, adding 33m of depth to the cave.

Destination: Sierra las Alazanas and Cueva los Hundidos, Coahuila
Date: February 10-14, 1977
Persons: Sheila Balsdon, David Honea, Janet Honea, Peter Sprouse, and Terri Treacy
Reported by: Sheila Balsdon

The objective of our trip, besides having fun, was to check several sinks (Hoya la Loba, Hoya Armenia, and Hoya lo Sartenejas) in the Sierra de las Alazanas, near the town of San Antonio de las Alazanas. The town is located about 60 km SE of Saltillo. Driving as far as possible, we parked at an elevation of about 7000 feet. We continued hiking for several hours up an old logging road eventually reaching a high ridge at about 11,000 feet. We camped in the first sink, Hoya la Loba, for two nights. Drinking water was not available on the ridge and had to be brought up from the stream about 1000 feet below.

Although the ridge top is a reasonably developed example of Alpine Karst, no caves were located in any of the sinks. This was most likely due to heavy sedimentation in the sink floors and to the general youth of the development. Frost fracturing seemed to be an important mechanism in the karst development.

One family resides in Hoya la Armenia. Vegetation was typical of high altitude areas and included pine, spruce, and aspen trees. Numerous trees had broken limbs or trunks suggesting a recent heavy snow. On the second afternoon of our stay, it snowed 1-2 inches. The high altitude record for snow frisbee was set at 11,000 feet on February 12. The sunrise on the snow the next morning was spectacular as was a leisurely hike back to the vehicle.

Driving about 15 km S of San Antonio brought us to the vicinity of Cueva los Hundidos. After waiting in the tents for a rain shower to pass, we took the appearance of a brilliant double rainbow as a good omen. A 30 minute hike brought us to the cave. We were not disappointed. The cave is developed in gypsum, the walls and ceiling show beautiful marbling of gray and white bands. The large trunk passage reaches dimensions of as much as 150 feet wide by 30 feet tall, ending in breakdown. The cave was surveyed, with a length of about 500 meters. We returned to the car after an exciting midnight hike through the desert chaparral to the tune of coyote howls.

We drove to Monterrey on Monday, the 14th. After visiting the Cetenal office to purchse maps, we gorged on cabrito and left for the border.

Letter sent May 2 from the French Readers Digest requesting slides of Sotano de las Golondrinas. Interested cavers with slides of Golondrinas should contact them soon.

We are looking for our book "Natural Wonders of the World" for transparencies showing "Sima de las Golondrinas in Mexico." Would you be able to send us a choice of transparencies on the subject or if not could you tell us an address where to make our request? Looking forward to receiving soon your answer.

C. Van Hieu
Documentation Photographique
Selection du Reader's Digest
5 & 7, Avenue Louis Pasteur
92 - Bagneux
FRANCE

HUAUTLA PROLOGUE

To those unfamiliar with the Huautla region before reading this article, I believe it only fair to present a view from the other side of the fence. The Mazatecs have traditionally been one of the most isolationist oriented groups of the post Mayan-Aztec people. The building of the road to Huautla by the Mexican Government threatened their isolation causing severe resentment towards outsiders.

However, the communities within a reasonable distance of the roads soon learned Spanish and their children went to Mexican schools. Hostilities to outsiders eventually diminished in these areas. Unfortunately, new ideas spread at a considerably slower pace in areas not in close proximity to the roads and resentment remains high. The Fissure lies some 2km from the main road in just such an area.

Traditional Indian religion in the Sierra Mazateca applied great significance to caves. They were the portals to the underworld. Accordingly, a man would want to enter a cave for one of two reasons: 1) to commune with the devil or 2) to search for his soul which he had lost in some unfortunate manner.

With this perspective, one might imagine the Mazatec reaction when Huautla became the mushroom capital of the world. Every true hippie within 10,000 miles came to Huautla between 1965-1970 before the federales stopped them by roadblocks at Teotitlan del Camino. Visualize an Indian watching a spaced out hippie eating a live turkey in the town square, as occurred in 1964, and you might understand their further intolerance of gringos. Much of the problem which still plagues cavers in this area were brought about by the Hippie Era. Unfortunately, it was about this time that Russell, Evans, Fish, and other cavers were discovering Huautla.

It is a growing realization that the region is far from finished and that we are faced with the monumental task of reconstructing public relations. The question most often asked of our expedition Christmas was "Why do you do it?" In answer, we printed up 150 four page PR sheets in Spanish with maps and pictures. We explained the purpose of the AMCS in Huautla. In addition, the March expedition has the proper credentials and the outward appearance of a serious exploration team. Anything less would negate whatever progress we made last Christmas.

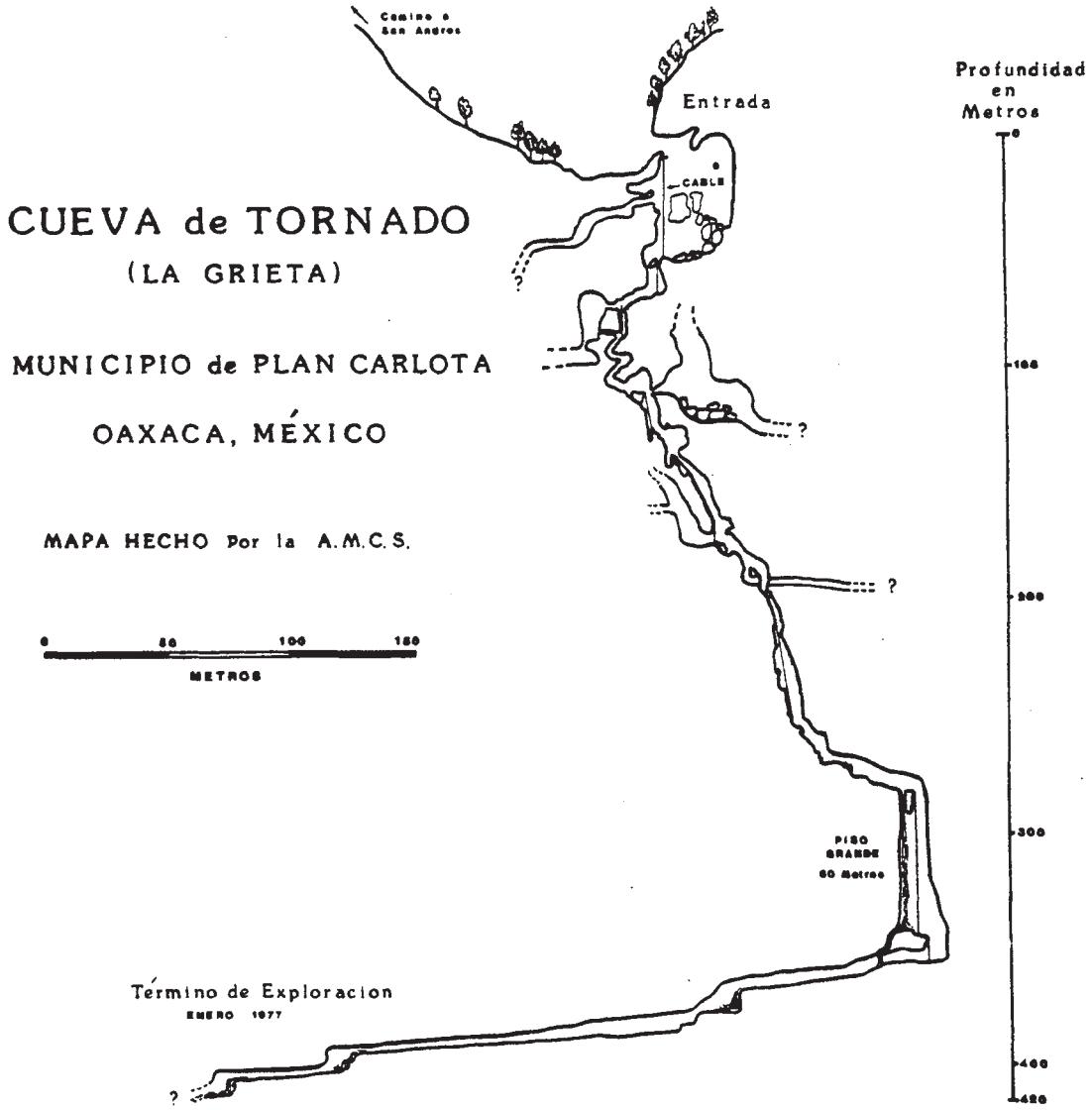
A DAY AT THE FISSURE

by Bill Stone

In December of '76, Frank Binney, Jeff Horowitz, Roy Jameson, Patty Mothes, Alexia Cochrane, and I left Austin for Huautla to connect with Richard Schreiber's crew in pushing Sotano de San Agustin. Schreiber's group had arrived a week before in San Agustin, promptly rented a house, surveyed to the -648m point in the cave, left a major going lead and were preparing to split when we arrived. Don Broussard and Jim Smith decided to join our group as Schreiber's crew pulled out.

We immediately set about warming up and acclimatizing in some smaller area pits and decided to push Don's infamous 'La Grieta,' otherwise known as the 'Fissure.' A description of the cave's notorious history would be proper for providing the correct setting for that which we were about to experience.

The Fissure was located by T.P. Evans in 1965 on one of his preliminary scout trips. In 1969 Don Broussard, David Honea, Meri Fish, and others were exploring down several drops with a limited amount of rope. Don remained topside to watch the rope. Throughout the day, many locals stopped to chat and at no time seemed hostile. The whole scene changed abruptly when one of the locals decided to assert his dominance. After he gave several Mazatec expletives and pointed to the rope, Don decided the situation was getting serious. As he turned to yell into the pit to the group below, a machete flashed, the rope was cut, and ten Mazatecs were sprinting down the trail. Meri Fish, who was climbing out on the rope, fell roughly 5 feet to the first ledge below the entrance. Had she been 10 feet lower on the line, she would have dropped close to 100 feet down the second pitch. Though shaken, no one was seriously injured. Don returned after a 4 mile dash for another rope and they hurriedly exited.



In 1970 a small group returned and mapped to the -400 foot level without incident. But due to further hostilities generated from near San Andres, cavers decided that the Huautla area wasn't worth the hassle at that time, and the Fissure project was scrapped.

So, six years later, we were back in Huautla at the Fissure. We rigged the entrance and Jim, Jeff, and Alexia rappeled in. Surely, the bad local feelings had ebbed we thought. As I was preparing to descend, one of the teenagers in the small group of locals that had gathered asked, "What will you do if someone cuts the rope?" That was all I needed to be convinced we needed a guard. While the others rigged in, I stayed and chatted with the friendly local that happened by. All seemed well.

About mid-afternoon two husky Mazatecs came down the trail with loaded burros. They immediately stopped, stood up belligerently, and said,"What do you think you are doing there?" I gave them my standard AMCS introductory speech. They replied,"Where is your permission?" Since we had only verbal permission from the Presidente of Huautla and had left the consulate papers in San Agustin, I was at a loss to present them with anything. They promptly demanded 50 peses, which is a lot of dinero to produce pitside. Naturally, I had nothing to give them and said so. I was immediately informed that they were going to cut the rope.

Well, I couldn't begin to write down the rash of thoughts going through my head at that moment. Neither of the culprits stood taller than my chest and couldn't have weighed more than 110 lbs. each. I convinced myself that both could be flipped into the cornfield if anything was seriously threatened. Nonetheless, that was to be a last resort as 20 peasants were watching from the far trail. In the meantime, one of the two was scrambling to untie or cut the rope, while the other was attempting to throw a noose over my head or whip me with his short rope.

About this time, they threw my pack into the pit. Visualizing my <u>last</u> Justrite lamp smashed to bits was the last straw. Apparently realizing this, they snatched a 10m rope and ran like hell. I chased them 30 meters and gave up. Through all this the rope didn't get cut or thrown in.

Had our problems ended then, it would have made an interesting campfire story. Two hours later, four somewhat smaller Mazatecs arrived and said the Presidente wanted to see me immediately. They didn't seem too hostile and I convinced them to wait an hour. Finally I heard Jim's voice below. All were up shortly and we had a quick conference. It was decided that Jim and Jeff would take all the gear and entrance rope and head for the house with instructions to contact the Huautla police if Alexia and I weren't back by morning. Alexia and I then hiked to Plan Carlota, arriving in a courtyard as darkness fell. One man produced a set of keys and unlocked a small door. Alexia looked at me and we both decided we weren't going in there until the Presidente had entered.

Shortly the political entourage came and all entered the small room whereupon a candle was lit and the kangaroo court convened. An old man read an official letter stating that all hippies in the region, especially those possessing such "cosas ilictas" as marijuana and hongas (psilcybin) were to be hassled and could be fined up to 1000 pesos and imprisoned. They then demanded 500 pesos! The situation was serious as they spoke very little Spanish but were making the case clear that if we had nothing of value we would spend some time getting acquainted with their jail. They even went as far as to suggest Alexia provide some "services" for the Presidente. We stated our case for about an hour and for some reason (Christmas Eve, Belief, Boredom? ?) they let us go after we promised to return the next day and pay the 500 pesos. We hiked back to the house and a heavy conference insued. There was too much equipment to abandon the Fissure, as it was left rigged, so it was decided to pull a political power play.

The next morning Francisco "Kissinger" (alias Frank Binney) met with the Presidente of Huautla armed with a leisure suit, a briefcase, and 2 copies of Inside Earth. Four letters were procured, addressed to the towns surrounding San Agustin. The letter to the "agente" of Plan Carlota was direct and explicit: These scientific technicians are not to be hassled and it is your responsibility to see that their work continues with no further obstruction. Frank and I hiked out to Plan Carlota where the edict was read aloud both in Spanish and Mazatec. The liason apologized for the hassle and the rope rip-off and said we were free to visit the cave. No money was exchanged, although we did give the Presidente a bottle of brandy.

In much higher spirits, we returned to San Agustin thinking that the matter had been settled. The Fissure was entered and pushed to -420m and still going. Activity was then switched to Sotano de San Agustin, leaving Roy, Patty, and Jeff to return to the Fissure to finish the survey and left no guard at the entrance save the bolt with chock backup we had set 3m below the lip. The first person up the drop was very consternated to find the rope cut just above the bolt, while in the cave, and the chock missing too! The locals were plainly not to be trusted. (Between skirmishes we did manage to push San Agustin to -2625 ft)

EPILOGUE

Eight cavers and one rider left Austin for southern Mexico on May 14th in Bill Stone's truck, "The Bozo Bus". They plan to spend three to four weeks in Mexico, first in the Huautla Area checking the Fissure, then moving north to near Zoquitlan to explore two poentially deep river caves. The cavers are: Bill Stone, Bill Steele, Cindy Coeburn, Cathy Roundtree Jeff Horowitz, Steve Zeeman, Ernie Garza, and Terry Johnson, along with Cindy who is riding part way down.

BRITISH MAP ECUADOR'S LONGEST AND DEEPEST - A July, 1976, British Army expedition set off to investigate Cueva de los Tayos in southeastern Ecuador. The cave was reputed by Eric von Danekin in his book "Gold of the Gods" to have been created by extraterrestrial beings, as evidenced by the rectangular passage cross sections. The group of civilian cavers and scientists that entered the cave found no evidence to support his claim -- the rectangular passage being formed in thin bedded, well-jointed limestone. Archeological materials were found near the entrance, identified as Pacific Coast materials about 3500 years old. The cave itself is quite extensive -- surveying showed it to be 4.9km long and 186m deep. Along on the expedition was American Neil Armstrong, the first man on the moon, who got in his first taste of caving. Perhaps he would like to go to Mexico?

from BCRA Bulletin 14

SUMIDERO YOCHIB

by Bill Steele

Blake Harrison's caver truck, the "Hog of Steel," pulled out of Kirkwood on March 4 occupied by Blake, Jill Dorman, Joe Lieberz, Carmen Soileau, Mike Van Note, Jim Smith, and myself. A 55-hour through drive netted the crew the desired rendez-vous date in Yochib village, north of San Cristobal las Casas, Chiapas, Mexico.

Mike Boon and Wes Davis from Calgary, Alberta, had been at Yochib for three weeks prior to our arrival. They worked on rigging the cave in preparation for the expected large turnout of AMCS cavers intent on finishing off the cave. This was the fifth expedition to Yochib.

Sumidero Yochib is an intelligent cave. Each step one takes in it must be calculated and confident. The water that flows in the entrance has been estimated at 40 cfs during its lowest ebb, enough to never allow swimming upstream against the flow, but enough to allow strong deep water that can pull the unwary over an edge.

Joining us when we arrived at Yochib were Norm Pace, Jean Jancewicz, Warren Anderson, and Chris Albers from Colorado. During the time spent preparing gear and settling into a camp, Wil Howie from Mississippi and Gareth Davis from Wales joined us, bringing our number to fifteen persons.

The Canadians had rigged to the drop prior to Camp I. Boon and Wes had had a rough time of it entering with duffle after duffle of tackle necessary to rig this vertical river cave. Some things had changed. Beneath the first drop where we had swum a choppy lake the year before, now we could wade chest deep rough water guided by a rope. The long canal soon after this lake was waded through in '76, now it was over one's head, requiring a 75m rope rigged to exit this trough.

Along in Boon's gear was a phone line he had picked up to install to a prospective Camp II at the terminus of previous exploration. This consisted of one mile of wire on a foot diameter spool, two phones, and a six-volt battery power source. The two riggers had brought the line to the end of the 75m canal. It was felt by Boon that it wouldn't be feasible to camp underground without daily word from the surface as to what the rain prospects were apt to be.

The first day of cave entry by AMCSers saw three separate groups entering with the purpose in mind of securing both traverse rigging and phone lines all the way to a speculative camp II on some flowstone deep in the cave. Hammocks were taken in to be strung. The camping team was to be Gareth Davis, Howie, and Boon. Four days was to be the length of their intended stay.

The initial rigging team consisted of Van Note, Jancewicz, Smith, Howie, and myself. Boon's desire had been for us to rig down to a Camp II, taking all gear found on the way with us. This turned out to be too much to handle. By the time we had reached Camp I, we had more gear than we could carry, let alone swim and maneuver. At Camp I, we deliberated and concluded that we should take only gear we knew to be needed to get to Camp II, leaving the campers to carry their own gear down or camp at Camp I if the rigging wasn't completed. The phone line was being brought into Camp I by Soileau, Anderson, Albers, and Pace. Beyond Camp I, Boon, Davis, and Davis were going to carry on with it to Camp II.

From Camp I we headed down rigging into Bad Dreams. We found here that the rocks we had stepped on previously to cross the river were gone and the water deep. For moments it seemed we would need to cross way above and bolt downwards. Van Note saved the occasion with a superb dive on gang belay by four ready haulers. The wave he caught took him into a cul-de-sac where he

could scamper up a wedged log and lead climb to a bolt on the other side. We rigged a 22m tyrolean traverse and avoided the floor thereafter in this spot.

Given the obstacle in Bad Dreams and the awesomeness of the first visit to such a cave by four of our five, we made it not to Camp II but to a point three pitches short of it. The camping team chose therein to stay at Camp I and work from there. Leaving Howie there, we exited the cave in time to hear the horror story of Pace being swept over a waterfall. He was alright, but for a time his comrades had felt certain he was drowned as they gazed at his unmoving electric downstream beneath a falls.

The following day those on the surface stayed there. It was assumed that the undergrounders would rig on to Camp II, so given two days, Jancewicz, Smith, and I entered prepared to camp as well. We carried rucksacks containing all of our own sleeping bags, food, clothes, stoves: self-contained. Upon getting to Camp I we learned that those in the dark had only succeeded in getting one trip in from there and had rigged on three drops and two canals to Camp II. After three days they were burned, ready for exit. Smith went out too, leaving Jancewicz and me to mind camp in the large lake chamber of Camp I. Twenty-four hours passed before we awoke to the whoops of Van Note and Smith entering for a push. They were fed and tended to in the homeiness of our flowstone perch. I joined them then, and we headed in for what we anticipated to be an enjoyable, highly technical bit of exploration.

It was a long one. Down across the tyrolean, rappelling, swimming, traversing, hauling. At the top of Froth Pot we encountered new cave and set about in the slow reasoned approach to descending a drop where so much water pours. It took two bolts, a pendulum cast off from an unseen boulder beneath a waterfall, and just the right projection to grab. We were hot and finding large majestic cave. It went; wind, water, passage.

Beyond a couple of swims and rigged cascade downclimbs, the river narrowed to a roaring gorge. We bypassed a couple of falls in an overflow with deep clear pools. The descending water narrowed more and we ascended the wall on the right, staying high. They were all lead climbs, three lead climbers one after another where you don't dare fall. On one flush wall climb where our lamps cast downward could just light the foam of white below, we thought of who may follow on later trips and rigged a long line for a hand safety. We also had to return.

Eventually our exploration led us down to near river level once again. We had rigged what we had to and were down to one ladder and one rope. Our looks at the river showed the water slowly running to a wall and flowing beneath with no apparent air space. The ladder was dropped to water level and Jim descended on the end of our final rope. He had an innertube for safety and we payed out the line as he called for it. "One foot of air space," he reported as the current pulled and he disappeared. We fed him the line as his calls for rope kept up. Soon he was a loud shout away but it seemed to be an echoy one. In what was only moments Smith returned with a beaming smile. "Big cave, come on." Van Note and I entered the water and pulled ourselves through the duck to what could have been the outdoors for all the ceiling told us.

I climbed up to the left, coating my soaked wetsuit with fine sand. The others took to the right wall. We walked away from each other for moments, then followed a curving wall downstream. The passage was at least 80m wide and certainly half as high. High on the walls we could see large white columns standing like supports. The room was silent. For the first time in Yochib there was no shouting for the least communication. The river calmed and ran level amidst large breakdown in the middle of the chamber. We walked the perimeter of the room and curved around to join each other at the far end. The river ended here at a rather large, 10m wide, deep sump; Yochib's end. Logs were all about on the shore of the sump. The water idled, benighly moving toward the wall with motion hard to detect. I climbed around to look along the wall the water ran benaath and spotted my canteen that had avoided my grasp a year before. It bobbed in the slight current here at the sump end of the cave.

Boon's feeling had been that convection currents brought rains in late afternoon making that period one to avoid for caving. We had planned on heading back to Camp I by 11A.M. but given the final room had stretched this time to 1 P.M. before we headed back up. The going was smooth though quite wearisome to pull oneself up against the fierce currents and across the tyrolean traverse.

Jean had been occupying Camp I during our absence. On my advice, she had not joined us exploring into Yochib. Instead, she had spent nearly fifteen hours in camp alone, feeling out the darkness. For hours on end during this time her ear had been against the receiver of the Camp I phone in hopes of voices from the entrance. Times had been scheduled for phone transmission but all failed due to the one underground wrist watch having not been wound by the first camping crew and the light bulb pager on the phone line not working.

Smith and Van Note exited in a procession that was an entertaining show to view from the elevated perch of Camp I. First, they scampered far below across breakdown to the shore of the lake. Crossing this, they climbed a ladder on the far side, 70m away, and then lit a throbbing waterfall going upstream. For a half hour their lights rhythmically receded upstream, climbing, swimming, leaping -- then the two of us were alone.

In the course of the following 24 hour period we were visited by two pairs of cavers passing through trying their hand at seeing a bit of Yochib, now that it was rigged. Both of these pairs made it only to Bad Dreams below Camp I and decided independently that a guide was a necessity, even given a rigged cave.

Word was sent out for surveying equipment to be brought in and those interested in photographing below to come in as well. The following day our camp solitude was pierced by the calls of several approaching cavers. It turned out to be all those from the surface that felt they wanted to see the whole cave. As the group filed into our flowstone home, I saw Liebera, Boon, Howie, Soileau, and Cavanagh. We joined them in wetsuits, gave them a headstart, then traversed downstream to catch them. Coming up behind them right before Froth Pot, I was able to explain the rigging and necessary moves coming up in the cave only three of us had seen before. Fairly smoothly, the 250 meters of recently explored cave was traversed by our party of seven, to the large sump chamber. Here we spread out and thoroughly checked out the final grandeur of Sumidero Yochib, converging on the sump. The idea was to survey the perimeter of the large sala, beginning at the sump, circling to the sump, then heading up river.

This idea was thwarted given an undamped Suuanto. Jean and I began the lead out while Lieberz, Howie, and Boon slowed themselves by photographing along the way. All went smoothly through the new cave but concern was in the air about the violent canals still above us, both before and after the drop named "the Stinger." While moving one at a time upstream toward the base of "the Stinger," Soileau ran into difficulty with the rigging, catching her gear at a most inopportune spot. Standing waves threw her about, knocking her helmet back, cowboy riding style. With one inhalation of water, she began to sink with the look of drowning on her face. She was given enough assistance to make it on through the canal. The call was too close to accept and had left Carmen fatigued. On upwards to Camp I, she was belayed in any tight spot as our tattered crew gained in elevation. Camp I still had plenty of provisions so Carmen chose to hold up there, watching all the rest of us leave the cave in procession.

The following day Boon and Gareth Davis entered on a "mission of mercy," bringing the over-extended Soileau to the surface. We were all together now, the cave was rigged all the way to the sump, and a large portion still remained to be surveyed. Smith, Van Note, and Harrison spoke up and headed in. In the course of an 18 hour trip they surveyed all the new cave of 1977, finishing the survey of Sumidero Yochib. They also derigged all the way to Parachute Corner.

Derigging remained. Two teams were decided upon, entering the cave hours apart. Lieberz volunteered to be independent, derigging the phone line from Camp I out the entrance. Pace, Van Note, Howie, Jancewicz, and I headed in first to derig below Camp I. Two duffles awaited us where we began upwards movement. It took us five hours to get our accumulating gear and rope coils up to Camp I. Here, we weren't met by the second group so we broke and cleaned up Camp I, then continued. Before reaching Fool's Falls, we were met by the second group of Dorman, Harrison, Liebman, and Wes Davis. Efficiently and safely we derigged out from there, ending at the entrance with five full duffle bags of equipment. Yochib had been explored to the end, ending five separate expeditions to explore the cave. The survey was completed and the cave derigged. No one had suffered any injuries but not to say scares hadn't been experienced.

EPILOGUE Rigging Sumidero Yochib in 1977, we had 27 vertical rope pitches, 23 rigged canal lines, and 11 ladder pitches. Ladders were used with ropes alongside for self-belay or no rope in the case of ladder pitches where pools below eliminated the danger of falling. We had no ladder mishaps but did have two ladder peels due to fatigued arms. Michael Boon, a caver of international experience, twenty some odd years of caving, and a veteran of every trip to Yochib, announced that he never wanted to tackle another like it. His feeling was that it was the most technical cave, requiring the most caution and thought of any cave in his repertoire. The Canadian Caver has published accounts of the exploration of Yochib as it has happened, and will be publishing the completed map in the near future.

An excerpt from a letter from Mark Stock to Bill Mixon. Reprinted from the Windy City Speleonews, Volume 17, April 1977.

Last December I went to Sotano de San Agustin with Richard Schreiber, Jim Smith, Steve Knutson, Don Broussard, E.T. Davis, and Phil O'dell. The first day we rigged down to about the -1250 foot level. The next day we got to Schreiber's lead (he had been there with some Canadians several years earlier) at the -1850 foot level. While Jim and Richard were looking at Richard's lead, I found an obvious route through the breakdown, which went to a passage going downstream. I worked my way back to the others, who then started on the route I had found. We only got about 500 feet further because we ran out of rope after two drops.

We had a day of rest, then E.T., Jim, Steve, Richard, and I took several more ropes down to continue. Since we had more than enough people for a mapping crew it was decided to have a two-person push crew. Steve and E.T. volunteered to be surveyors, while the three obnoxious bastards (Richard, Jim, and I) were forced to flip coins to see which of us would be stuck surveying. I lost. After a couple of hours of surveying (the passage was narrow and sinuous), we heard Jim and Richard. They came back reporting having found a huge lake which was a terminal siphon. Richard took my place on the survey crew so I could snoop out the lake. Jim carried the extra ropes back to Richard's old lead. I followed the passage down to the lake and swam across it. It's kind of wierd swimming across a large underground lake when you're solo. When I got to the other side (only about 100 feet, actually), I started poking around in the breakdown. After about 45 frustrating minutes worth of dead ends, I found a way through. I got into a 15 foot wide, 40 foot high passage with four times the amount of water that we had seen in the stream at any other point in the cave. I progressed downstream, lowering myself on the lips of pot holes. I reached a point, about 20 vertical feet below the lake, where I wasn't sure I could make it back. That is where I wimped out. The field calculated elevation of the surface of the lake was -2150 feet.

After a day's rest, we derigged the cave. Richard wanted to leave Huautla a bit early because he wasn't sure that he could get his van out on the horrible roads. When we arrived back at the surface, we found that a group of Texans had arrived.

Our group, except Jim Smith, left the next day. Bill Stone drove his monstrous truck back with the van to help pull Richard out of mud holes. His help was both necessary and appreciated.

After we left, Jim, Bill Stone, Frank Binney, and Roy Jameson re-rigged San Agustin and pushed the route I had found. They reported huge borehole passage with much water. At the end of what they found, there was a fissure taking three times as much water as I had seen. At this point they wimped out (at least I don't think that they were out of rope). They claim that the surveyed depth of San Agustin is now over 2500 feet, but then that may have to be rounded downward knowing the Texas exaggeration factor. The cave was definitely continuing at that point, but drier weather would make things more pleasant. There is a very good chance of connecting in higher entrances, perhaps as much as 1000 feet higher. Supposedly, the cave can go 1500 feet deeper as well. Maybe North America will finally have something to match Europe !

Mark Stock

NEW YEAR'S DAY IN SAN AGUSTIN

On the afternoon of December 27, Shela and Tracy Johnson and Gary Stiles arrived from Acatlan. Activity was shifted from the fissure to San Agustin and many discussions were held concerning the various aspects of the base camp and the assault plan. After a days rest and rope sorting Gary, Jim, and I rigged down 15 pitches to Camp II at -530 meters. The round trip took only 7 hours and was especially delightful to Gary and I who hadn't before seen those magnificent waterfall pitches in the fissure passage.

The next day was a rest day and menus for the push crew were planned for the main assault. By 3:00 P.M. December 30 all was ready. Laden with monstrous duffle bags of equipment, rope, and food, our supply train descended. Frank, Roy, Jim, and I comprised the push crew, while Alex, Jeff, Patty, and Gary the support team. What had been a delight to negotiate on the rigging trip became an obstacle course with our bulky gear sacks. Most of us rappelled with the duffle slung off a two meter teather attached to the rack. Even so the unbalance was annoying, especially on the tyroleans. Land ho! We soon arrived at Camp II -- a 6 by 12 meter spacious flat sand bank elevated several meters above the cobble floor. The passage was perhaps 15 meters wide and 20 high. Nearby the roaring water from the fissure dropped through the floor into the canal leading to the 2009' level. After some hot tang, the support crew bid adieu and head out. We would not see them again for 3 days, if all went according to plan, at which time they would bring an additional 2 day's food and more rope. We then set about the task of housekeeping at -530 meters. Home sweet hole! Since we had been up for a considerable time we decided to take a sleep shift and begin work the next day (night?). No one had a watch so this was bound to be an interesting experiment. There was little to do around our cook rock except eat and sip an occasional capful of New Year's cheer (Aguardiente), so when that was done, we crashed.

I awoke first to the persistant roar of the waterfall and the green glow of the cool-lite marking the bog (our outhouse). Discretely firing up a carbide lamp, since I really had no idea if I'd slept 5 hours or 15 hours, I commenced work on my ratty Nam boots with a knife and a sewing awl. Oh, yes, another thing we learned...even the fine citizens of San Agustin will appropriate the shirt off your back -- while you're still in it! After many warnings from Epifonio (our landlord) to lock things up, we still hadn't learned. As a result, my new pair of Nam boots disappeared from the doorway they were drying in, the day before the push. All I had left were soles and uppers (not really in one piece) of my veteran Montana boots. Two hours later they were almost serviceable.

After breakfast we crawled into our slimy, cold wetsuits amid many expletives and bounced down the passage with all the rope we could carry. In short order, we had rigged to the 2125 level and swam across the lake. Not really knowing where Mark had gone, we split up. Jim and Frank went through the dry breakdown while Roy and I swam several canals and arrived at the same place. A powerful waterfall was audible in the distance. This had to be it. Thirty meters of raunchy breakdown crawling and we arrived at the gorge. I cannot use enough superlatives to describe this magnificent passage. Fifteen cusecs of water thundering down a six meter wide thirty meter high passage. The multicolored walls were perfectly smooth, polished like lab specimens. The pools were aquamarine blue and crystal clear. Wherever a handhold or tie off was needed there was always a sculptured solution hole. Beautiful cascades and sporting free climbs added to the excitement. On one pitch, the grand cascade, the water arched out 5-6 meters into a 15 meter void. An exciting tyrolean along the side of

the falls had to be done with electric lights due to the high wind. After an endless series of climbs, cascades, and swims the passage enlarged to 30 meters by 15 meters. Another 30 meter swim and we arrived at a major junction -- 30 meter X 30 meter passage -- going both directions -- with a minor river in the down dip direction and a dry fossil river passage going up. We followed the river for 300 meters to a narrow canyon. Another 8 meter pitch and we're looking at the most sporting drop we'd seen yet. An additional 15 cusec stream came roaring out of the right wall and plunged into the pit adding its fury to the white water from the main stream. Sporting indeed! Jim volunteered to check it. With some difficulty he reached a ledge over-looking the next pitch -- nothing but blackness and spray. How deep? Maybe 10 meters -- maybe 100. At any rate, considering all the factors we decided to stop there and begin surveying. Later calculations showed this point to be about 800 meters down (2625'). We established a permanent station some 30 meters above this point and commenced surveying out. We stopped shortly to check out an immense side room. Leading up from the main passage, it was up to 120 meters wide in places, perhaps 30-50 meters high. We barely scratched it in over 20 minutes, but checked it enough to ascertain that it would serve us well as Camp III, should it be needed. After 10 more stations the survey was aborted. Judging from our carbide supply we had been at it for over 20 hours and split for camp. A fine sight indeed. What a joy to shuck those wetsuits for some nice dry jeans and a wool sweater. After a fine dinner and more Aquardiente (we figured it was New Year's Eve), the sand seemed far more comfortable than our first night.

The next morning I was at it again with the boots and several packs also needed sewing. Between sewing and sipping, it became apparent that no one really wanted to go caving and a rest day was declared. After half the Aguardiente was consumed we went about a lazy-crazy photo trip -- down route '68. How brave. A lazy trip at -1800' !

The next day Frank decided to remain at camp to welcome the support team. The rest of us surveyed in from the 2125' level and connected the two surveys. We decided we could best utilize our free time then to scout for a dry bypass to the main canyon rather than attempt a frontal assault. The left hand trunk passage was more complex than we expected. We walked up several hundred meters of one branch of it till we hit a stream. Jim and I followed this for 200 meters or so to a sump. We swam through all sorts of interesting portals and ducks, but no leads were to be found. All the passage in this section was just as finely polished and multicolored as in the gorge, but seemed more recent. All the edges were razor sharp in contrast to the rounded knobs in the gorge. Another side passage off this stream connected us back into the trunk. Amazing. Well over a kilometer of virgin cave, with no doubt much more if we had continued in the main trunk. Downstream, we found where the additional waterfall originated. A short side passage led to a large stream resurgence, perhaps a pirated portion of the main stream. We followed this to where it dumped into the final drop, so it looked like no dry bypass was in order. After roughly 16 hours we returned to camp. The support crew had made their scheduled supply run almost a day late, leaving us with two more days food and 300' of rope. However, upon inspecting our carbide supply we found it to be dangerously low. There was not enough left, even with our nicad packs to risk another survey trip. Thus, this small oversight along with ebbing enthusiasm led to the decision to leave the following morning. Frank and Roy started after breakfast while Jim and I cleaned up camp. Two hours

later Jim and I began the long climb. Ascending with those soaked duffle bags proved to be even worse sporting than rappelling with them. I became so overheated on the 200' pitch that I shucked my wetsuit top for the rest of the trip. At each ledge we coiled the ropes to keep them out of the driving waterfalls. Thus, the cave was left pre-rigged with cut to length ropes below the 800' level to await the return expedition. All rope above the Canadian camp was derigged. A full moon was shining in the entrance when we finally exited. Topside we heard familiar voices: Blake Harrison and Jill Dorman, who had arrived from Acatlan the day before, had seen lights in the sinkhole and came down to help. A party soon commenced back at the house. After several hours of swapping stories we faded off to a well-earned nights sleep.

The rest of the trip was understandably anticlimactic. The fissure was finally derigged by Jeff, Gary, Blake, Dave Kramer, and Dan Watson. Several days of scouting netted few going holes and a general impression that anywhere outside a 1/2 mile radius of San Agustin was hostile territory. An overland survey connecting Sotano del Rio Iglesia, Sotano de San Agustin, Cueva de San Agustin, and Deer Cave was completed. Deer Cave (Cueva de los Pajaros) was located by Frank Binney on one of the early day hikes and proved to have more paleontological significance than depth potential. Numerous skeletons of what appear to be a large deer were found at several locations, well within the cave. How they survived three drops to reach the big room at the bottom was not readily apparent.

An exciting day was spent fixing the Bozo Bus springs as most all of them on the left side had broken during our many shuttles to Huautla and back. After another day of packing our small convoy of one overloaded VW bus and one crippled truck left Huautla. Within 5 miles we had broken more rear springs. Things were looking grim. We loaded 3 more people from the truck to the van and continued at a slow pace. The two remaining springs miraculously held. Again we figured we just might make it. Then Dan smashed his oil filter on a rock. With the bus now out of commission the only way to continue was for the truck to tow it. And tow we did. By all rights both vehicles should still be on that road, but we somehow made it all the way to Tehuacan, a spring shop and a VW dealer.

Bill Stone

Remember the 1978 NSS Convention is near Mexico. Many of the Mexican cave areas are high in the mountains and cool in the summer, so make plans for a summer trip in 78.

THE FORBIDDEN LAND.....RETURN TO HUAUTLA

by Bill Steele

The revisit to San Agustin at Christmas time by AMCS'ers and others from the USA showed that indeed the deepest known cave in the Western Hemisphere was deeper. Georgia's Richard Schreiber had in mind ever since the 1968 survey party he was on, the lead high at the end of the large walking passage taking off at -536 meters. When his team once again entered the Huautla area, rigged down to this lead and began poking around, they found going cave dropping mas abajo. Schreiber's Christmas crew was replaced upon leaving by Stone and company from Austin. This crew camped in Camp II at -536 meters, exploring downward through a gorge named the Cascada Grande. They found some large chambers going off at -750 meters. These leads remained as well as the enticing downstream pit lead that they gazed down beyond these side leads in the main stream passage.

The Chancho de Acero's (Hog of Steel) crew consisted of Blake Harrison, Mike Van Note, Jean Jancewicz, Bill Steele, Jill Dorman, and Jim Smith when we arrived at San Agustin one day prior to our rendez-vous date of 25 March. Our meeting was to be with Richard Schreiber's crew consisting of he, Marion Smith, Steve Knutson, Gerald Moni, Warren Heller, and Don Broussard. This group had arrived two days earlier, 22 March.

On the evening we arrived, only Knutson and Gerald Moni were at the rented house standing on the south edge of the large doline of San Agustin. The others were underground, rigging and hauling in camping and food supplies for a planned five day stay at Camp II. They all exited mid-evening after having gotten their things to the -400m level.

Early next day found those of our crew that had never before seen the Huautla area in astonishment at the scenery. Dolines couldn't be that big. The only flatness to be found were the floors indoors. Water? Oh, just go by the church and take the trail down to the entrance of Rio Iglesia, only 175m vertically downhill.

Schreiber and Heller entered San Agustin late in the day of March 25 planning on taking their food on down to Camp II, beginning the camp stay. After nightfall they returned to camp stating their psyche's hadn't been ready so they exited to try again another day.

The six of us from the Hog were as a majority feeling ill. Three weeks into high powered caving, we were suffering from far reaching ailments of cuts and abrasions, sore throats, TP consumption, trashed gear, love triangles, and road weariness. Slowly we sewed up packs and wetsuits, boots and harnesses, charged up batteries, packed up food, and attached shoulder pads to duffle bags. The earlier arrivals were ready to go so on 26 March, a Saturday, Marion Smith, Gerald Moni, and Warren Heller entered to carry on down to Camp II. The following day, 27 March, saw Schreiber, Knutson, and Broussard enter.

The Hog crew was alone. All were ready to go in as well on the 27th except for Van Note. He had injured his ankle while swimming in some rapids and asked for an additional day for regrowth. Early on 28 March the six of us that had come from Chiapas were ready to go into San Agustin. A note was left inside the window of the Hog for Liebman's truckload coming in an unknown numbers of days. It stipulated how to enter the rented abode, what we were up to, and that they should prepare their gear for an underground stay. The note was left on a Monday stating we would exit at latest on Friday and they should wait for word on what was happening exploration wise.

Our group of six intended on rappelling down with camping provisions for five days, going past Camp II, and establishing a Camp III in the Sala Grande de la Sierra Mazateca at -750m. This was quite an undertaking considering that this was much deeper than any of us besides Jim Smith had ever before been. Things went smoothly, descending. Jim Smith led the way following by Jancewicz, Steele, Dorman, Harrison, and Van Note.

At -400m we encountered a tricky maneuver at the base of the last drop in the fissure series. Smith stayed to advise all what to do so Steele led on down the 318' to keep momentum flowing. While Jancewicz was coming down the 318, Harrison suffered an injurious fall at the tricky maneuver preceding the drop. Confusion ensued due to the impossibility of communicating up and down the pit. Not realizing anything other than a delay was happening, Steele and Jancewicz went on down to Camp II to wait there for the other four. Up top at the 318, things were hectic. Harrison's fall dropped him to eight meters. At first diagnosis it was felt he had a possibly fractured collar bone, pelvis, fingers, and skull. He was given to bouts of delirium. Seeing his condition, Dorman became hysterical and the decision was made for Smith to ac company her topside and return with a packframe to support the injured Harrison. Those below had no idea of these incidents.

Upon reaching the surface, Smith found that Liebman's truck had arrived giving enough personnel to manage a rescue. In the ensuing 31 hours, Lieberz, Liebman, Cavanaugh, Smith, and Van Note rescued Harrison from -400m and got him to the hospital in Huautla. It turned out he had only a broken finger, cracked rib, and general soreness. This is the deepest rescue accomplished outside Europe.

When Jancewicz and I arrived at Camp II we found it empty of cavers. All were on a trip deeper. We waited beneath a space blanket four hours for our teammates, finally assuming a minor accident had occurred and they were assisting someone. It seemed minor because there were only four of them, no one on the surface, and eight of us below for assistance. We bedded down in Camp II, anticipating the others to come back the following day.

Well into a night's sleep, Schreiber's crew returned from below. My question as to what they found netted only a sump for reply. They'd gone two additional drops and had hit deep water with no outlet. Schreiber, Moni, and M. Smith had done this while Knutson, Broussard, and Heller had surveyed in another area near the bottom. There were still leads but the report was that the cave appeared to be bottomed. On the day before this trip, Sunday, Heller had led the climb at the end of Camino '68 and the crew had found three drops and a long breakdown slope led to the lake leading on below. The torturous breakdown down-crawl that Mark Stock had pioneered and had led to the lake area at Christmas time had been bypassed. This good news was greatly outweighed by the sump news.

Still, no one from the surface. A full day had passed. Jancewicz and I decided to head up the 175 meters to the top of the 318 for provisions from the others' packs, if there, and perhaps to piece together what had happened. I arrived there first and began to notice clues. First, Smith's pack lay there with items on the ground as if he'd dug into it swiftly. Dorman's pack was unopened. Climbing along the traverse to the bottom of the next pitch, I saw a spent carbide trail. It wasn't a powder streak, but spots here and there, good carbide that had been spent from moisture;

a pack had fallen and spilled out its contents. Leaning out and looking far below, some eight meters, I spied a pack frame. Climbing down to see it closer, I came upon the scene. Blake's pack, a full duffle bag, lay unopened. Van Note's had been emptied in haste, the contents damp and strewn about. A shirt with small blood stains below the nape of the neck was there. Then, Harrison's vertical gear. He was hurt. He hadn't gotten himself out of the cave. But how? The packframe had a name label on it with Bill Liebman's name. Odd. How had he gotten there? Why hadn't they come for us? How badly was Harrison injured? There was no note to be found. We were 400 meters below the entrance, the accident was 28 hours past, and we had not expressed any plans to leave the cave with those at Camp II. We were only to get what we needed and go back down. It felt like grave robbing to go through Blake's duffle bag.

In Camp II, speculation ran rampant. Why, how, and how badly? Someone will be in tomorrow. Maybe we should exit. Who wants to cave? We bedded down for another night hoping to see some surface people upon waking. Waking up brought us to the 30th. The plan for the day was for all people in Camp II to go to the bottom area. Dividing into two groups, one group would continue the survey to the sump found on the last trip, the other would go into the left hand trunk passage and survey it and side leads.

In the bottom area the left hand trunk was surveyed into by Schreiber, M. Smith, and Moni. Marion's underground journal entry reads:

> Richard, Gerald, and I mapped c 1590-1800 feet in branching borehole passages to the left as you go into the cave. We also followed an incoming stream a ways until we encountered some very steep climb-ups. We mapped several side leads off this main left branch. At survey station S44 Knutson's Suuanto compass got too cloudy to read. Finally, at 7:10 P.M. we headed to Camp II.

Broussard, Knutson, Jancewicz and I took the survey to the sump, plumbing its 29 foot depth as our last survey point. I climbed into a tight chimney type fissure for over 30m above the sump but found no way beyond. We then began a survey upstream a ways into the Sala Grande de la Sierra Mazateca. Broussard led the way up into the void of this gigantic room and we followed with the survey. It was immense. We stayed on the left wall deciding to survey around the perimeter to do it justice. The floor was a steep average of 25 degrees. Don could be seen way above as a shrinking form. The ceiling of this passage continued at the same angle above a 22 meter high crumbly dirt wall that ceased our advance. At the top of this wall the passage appeared to continue on. I attempted the climb, getting halfway up to a committment move and backed down. It would take long mud pitons -- maybe made of re-bar to aid the climb up.

Our survey down-climbed the opposite wall heading for a side room containing a waterfall descending from the ceiling. We ended our survey

here and poked around for leads. This could very well have been the last trip into the area so we wanted to make sure of all possibilities. Jancewicz and I followed the stream into breakdown below the waterfall, finding a gorgeous passage adorned with banded swirls of stone and solutioned flowstone. The others had said we had a half hour to check it, so we explored to our dissatisfaction, vowing to return and survey.

Arriving in Camp II on the heels of the other party, we learned that Heller had left a note stating he was exiting, heading home to Boston. We hadn't realized he was doing so. Marion writes of the next morning:

> Don soon came, aroused our camp, and said he and Steve were leaving. At c 11:15 Gerald said he was also leaving. So those who were planning to leave slowly packed. Gerald started first with Richard. Richard was planning to take some ropes to the top of the 318 and get some canned goods and return to camp. By about 2 P.M. Don and Steve had gone also. I shot the breeze in camp with Bill and Jean eating gorp. At 3:30 P.M. Richard returned to camp saying, "People we have a serious problem," meaning that apparently Heller had pulled his pack up the 318 and that the rope did not get back down! We were trapped until someone from the surface came in. Richard had freeclimbed maybe 50' up and didn't even see the rope. Also he swam the pool at the bottom looking for the rope. Don and Steve took quite a look also. Soon everyone was back in camp -- all seven of us at Camp II. The situation was compounded by the fact that today Don had taken his last insulin shot. The whole trip seemed to be quite strange and uncoordinated, especially because we don't know what's going on on the surface, how badly Blake was hurt, and it or when wnyone would come into the cave. Don said that tomorrow he'll start feeling the effects of having no insulin and after three days probably wouldn't be able to get out on his own. The group immediately elected to watch food consumption more closely.

The following day, April Fool's Day, we awoke with endless speculation about what to expect from the surface. My note (Steele) left when we entered the cave had stated that at latest we would exit on this day. Heller however who had exited two days before knew there was plenty of food at the top of the 318, left by the accident crew. It was of course out of reach for it was at the top of the ropeless pit. A trip to the bottom was decided upon. Jancewicz, M. Smith, Schreiber, and I took three hours from Camp II to where we carried on in the left hand trunk area at -750m. Three leads were finished off including the downstream tributary that ended at a sump. From here we took to the waterfall passage off the Sala Grande de la Sierra Mazateca and began a survey into it. The survey led to a very wet pit that had been overlooked on the probling trip Jean and I had taken into the passage. We elected to return to the large room above to get the Samson 2 in 1 that was there and see what happened below. Marion writes:

> We retraced our steps to the new pit (I carried the rope) and surveyed down it. I was first down, followed by Bill, Richard, and Jean. It was quite wet and was followed 40' later by a slope (rope needed) to a second 40' pit. In between water gushed from a 6" diameter hole in the wall like a fire hydrant. Steele, by clever use of his slings, got to the opposite side of the pit. He rigged the rope and after getting me to tyrolean across, dropped the pit, staying pretty much out of the water. The rope was 5' off the bottom. Ten horizontal feet later he found an estimated 20' pit. This was ofcourse as far as we could go. The second 40' drop actually measured 13 meters and had water pouring into it from two or three ways, one way from down a flowstone area above.

This twenty hour trip brought us back to a camp that had not changed. Broussard had remained as inactive as could be to maintain his energy. In his journal he had written out details informing us what to do in case he was unconscious when someone finally came in from the surface. I was taught how to give a shot and tried once giving Don 7cc of insulin he had managed to suck into a syringe. I gave it into his abdomen. The day was spent in speculation about the surface folks and in whether or not an attempt should be made to scale the 318 in search of the rope somewhere above.

The next day was Sunday, 3 April. It had been six days without word from the surface. We had been trapped for four days. This was the day to try the 318. Broussard helped me set up a sling of jury-rigged climbing aids for the attempt. We had eight bolts. Marion's journal reads:

> Bill went around camp collecting slings, carabiners, and anything that could be used for chocks. Those who were going got a substantial ration of hot food -- potatoes and some kind of meat, I think. Finally, at 11:25 A.M. Bill, Gerald, and I left. Bill went up the 60' and 180' drops first. I followed. Near the bottom of the 180' Bill tied another rope to the main line because the main line had a bad fray in it. Once Bill was up the 180' and while I was on rope I heard a commotion at the top of the 180'. Soon I heard Bill shouting, "People! People! Whoever you are I love you!" which caused great excitement for me and I too joined in the shouting and told Gerald at the bottom of the 180' to go back to camp and tell the others. When I reached the top of the 180' I learned it was Joe Lieberz who had shown up -- alone....This reunion with Joe was GREAT as of course it meant we were no longer trapped! Jean later said when Gerald walked back into camp everyone stood up and silently waited to see who it was and what he wanted. She thought someone had forgotten something. But then Gerald said that there was good news, the rope was down.

Everyone but Jean, Joe, and I left the cave. Joe climbed back up the 318 to bring down some of the food that had been there. Broussard, contrary to what he had anticipated his condition would be after three days of no insulin, packed up and headed out. A discussion ensued between Moni

and myself about trash and abandoned gear. It was evident that more than footprints were going to be left behind. Now that the rope was down and an exit was possible, somewhat of a rout happened. These fellows were all leaving. They'd had enough. Though when our group first arrived they said they could stay three weeks or until the cave was done, they were going. We had vowed to clean San Agustin as was known by the entire group, yet still, articles were left lying around Camp II as these cavers headed out. Moni stated that he had buried his trash but refused to tell us where it was so it could be dug up and hauled out of the cave. Knutson had brought in a $10 sleeping bag so he could leave it in the cave. This amazed us as some of us had believed in the "nothing but footprints" slogan. Nothing but footprints, sleeping bags, clothes, canteens, insulite pads, duffle bags, crushed cans, ropes not used, batteries, 25 cans of food not opened, and medicine was left. It was a rout.

Jean and I moved down passage to the quieter location of Camp IIA. I had sent a note out with Marion asking Jim Smith and Van Note to come in for a push. We waited, our spirits high. After a period of sleeping, we awoke to the first day of our second week underground. Several hours later a holler was heard proving to be Kim Hastings and Van Note. Kim had only done a 120 foot deep cave in New England before and was here at Camp II at -536m. They brought bad news. Due to the triangle that had been an issue the whole expedition of Smith, Dorman, and Harrison, the vehicle was leaving. No support now existed to carry on exploration or de-rigging or hauling back anything to Austin. After much deliberation we decided to leave camp intact and go to the surface to arrange for unneeded gear to be taken in the truck. We then would continue in the going lead below and survey it. If we found it to keep going, we would leave the cave rigged and wait for Bill Stone's group coming down in one month. If an end was found then we would attempt to de-rig to the base of the entrance pit, ride buses back to Austin, and have Stone bring gear back in May. The prospects didn't seem appealing but Van Note had said the truck was certain to be leaving, giving no recourse.

Our exit only happened to the base of the 318 where Van Note yelled down for us to remain; someone was coming in. My feeling was that some of the previous day's routers had succumbed to guilt and were returning for their articles littering the cave. I'd just found Schreiber's sleeping bag, clothes, foamy and duffle bag at the base of the 318. When the descending form of someone reached the base of the drop, it was Steve Zeman. He and Dino Lowry had flown to Mexico DF, bused to San Agustin, and had been hastened by Broussard to get down to us and save the expedition. We were overjoyed. We didn't need to leave. They brought both news that the Hog of Steel vehicle wasn't leaving and luxury food stuffs of cheese and sweets. Once again, the 318 had been the location of a change.

Our five descended to Camp II and settled. By this time everyone camping was coughing with what was later diagnosed as bronchitis. Zeman and Lowry were worn out from a non-stop trip from Austin so were content to hang in camp, resting. When we awoke the next day, we readied for a long trip. I was the last to don my wetsuit but found the zipper to be broken. An operation followed that cancelled the trip. The final product of our labors was a corset-like wetsuit top, laced and looking medieval. It became a pull-over top.

We waited one more day to optimize our energy and psyches. The trip to the going lead would be long. All seemed right so on 6 April we began the trip downward from Camp IIA to the going downstream lead. The trip through the gorge area was smooth. Behind could be heard the delight of the newcomers at the beauty of the banded marble appearing walls. It was

deeper than Lieberz, Zeman or Lowry had ever been. When we arrived at the end of the last survey, we faced virgin cave. I rigged the next drop, Jancewicz joined me in the torrent from above and was sent on down to explore ahead. We then began the survey. When the shots had been recorded and all others were down the next 10m shaft, I heard a shout from above. It sounded like Jancewicz so I assumed she had explored around somehow and was coming down the ropes. Instead, it turned out to be Jim Smith. He had come in solo from the entrance, had found our note at Camp II saying where we were going, and had sought us out.

We all descended into new cave. Smith and Jancewicz led exploration while our survey followed. There was more water in this passage than had been seen elsewhere in the cave. Several climbdowns were done in the water where it poured into pools below. There was much swimming between drops. Finally, after setting stations in this downtrending passage, we caught up with Jim and Jean at a sump. Jim had dived into a sump with a line being dealt by Jean. He had, after two meters, come up into air space. This stretched 5m and then sumped again. It didn't look good. A belayer for another dive would have to do so while already beyond one sump and treading water. Not an appealing project. The ceilings character didn't give an impression of going cave beyond.

Our team of six members began de-rigging from this sump at -859m. We had been out of camp for 24 hours when we returned laden with all the ropes from below. It was April 7; we were expected on the surface late on the next day.

De-rigging

We had a very surmountable chore in front of us in derigging Sotano de San Agustin. There were six of us in Camp II and three persons on the surface. Of these three, only Broussard could be expected to lend much support. When Camp II was cleaned up we had two full duffle bags plus a large pile of ropes. In addition, we also each had a rucksack containing our individual camping gear. Our plan was to exit from the cave with these camp packs and return to Camp II to de-rig in stages from there. We hauled all gear from Camp II to the base of the next pit and headed out from there. Smith and Lieberz, being last in the procession of our leaving, followed up hauling the total burdens upward. They got all ropes and the two duffles to the base of the 318, two drops (80' and 180') above Camp II.

The 180 had eaten one rope already. A knot needed to be passed some 5m up the drop where two ropes were tied together where the fray had been. Being first up on our exit, I encountered the worst fray of my vertical caving life some 30m above the point where the other had been. The sheath of the Bluewater II was totally gone with six inches of inner core showing, looking like taunt rubber bands. This was tied off with a figure 8, bypassing the damaged area. The pit this happened in is a Goldline drop if ever there was one.

Two days after leaving the cave and following an Easter in Huautla, six of us reentered San Agustin to work further on de-rigging it. The twenty some odd cans left by Schreiber at the top of the 318 were emptied, crushed, and the food dumped in the stream to be flushed with the torrents of the coming rainy season. The 318 took our team seven hours to move everything up. Lieberz worked the bottom, tying on gear. Jancewicz was stationed on a ledge 20 meters down that every load hung up on. Zeman, Jim Smith, and I did the muscle at top while Dorman fed the jumar safety brake. We had a separate haul line, making sure it and the main climbing

line didn't cross; nylon against nylon could sever a rope from the heat of friction.

In the course of a long, 20 hour trip, our six derigged the growing load up two drops. We had all above the 110' following the 318 when we headed out with individual loads of rope to be dragged out to the house. The fissure of San Agustin had proven to be a poor place to rig from above and pull gear up. There were just too many spots the gear hung up on. The decision thusly was made for the fissure to be derigged "ant-like;" individual burdens climbed with through the narrow confines of the fissure's rift. This proved to work. Within four hours on the next trip in, the fissure was empty of all.

Camp I, the sight of the Canadian's 1968 stay, proved to have two duffles of plastic containers, food, and cans. This was added to the surmounting pile and moved on. The broken 160' pitch above Camp I was accomplished by spreading people out on ledges up its distance while pulled from above. It worked. By the end of this second full trip of derigging, 18 hours, all gear was moved to the base of the entrance pit.

The final derigging effort was accomplished on the 8th of April, 1977. All eight of us that were left at San Agustin hauled the seven duffle bags and more than 50 coils of rope up the 260' entrance drop and carried loads to the rented house on Kelty packframes.

The next day we left for Austin.

Bill Steele

Each person who receives this Activities Letter is a member of the AMCS and should have his membership card. If you do not yet have your card send a note to Box 7672 and we will send you your membership card.

HUAUTLA AREA SURVEY: Following the successful overland surveys of the Otate Mine, the San Juan plateau, and the Silvertip Cirque in Montana, many AMCS cavers have taken note of the usefulness of this type of speleological tool. Not only does a computer generated plot show which passages are likely to connect in an extensive system, but they also give us keener insight to the spepeogenesis of the caves in a particular karst area. The former was used to great advantage at Silvertip last summer...knowing that that raunchy crawlway will connect gives much greater enthusiasm to the push crew.

Besides the obvious advantages in the field, such a survey is a powerful graphic media for the final bulletin. The reader immediately understands what is going on in the area -- which are the major systems, where they are located, and perhaps some insight into the full potential of the system.

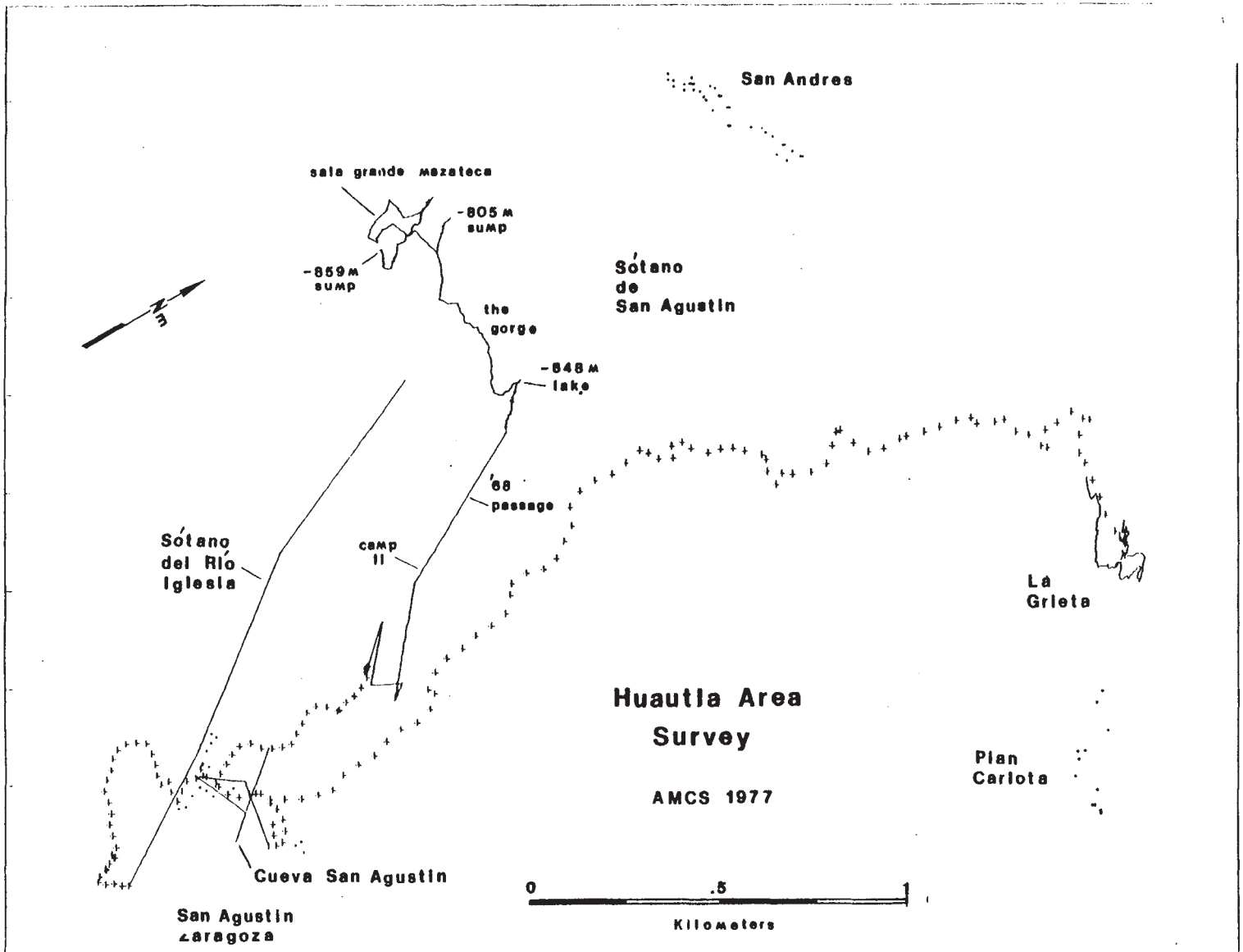
With the ultimate goal of a comprehensive bulletin on the Huautla, Oaxaca, karst region, we began the overland survey in January. Jim Smith, Jill Dorman, and I connected Rio Iglesia, Cueva San Agustin, and Sotano de San Agustin with our datum point at Sr. Villega's house. Later, in March, Bill Steele and Jean Jancewicz surveyed to La Grieta (Sotano del Cerro de Plaza). These segments were then connected with the main cave surveys. Downstream San Agustin was surveyed by the cast of thousands (R. Schreiber, M. Smith, J. Smith, M. Stock, T. Davis, S. Knutson, D. Broussard, F. Binney, B. Stone, R. Jameson, G. Moni, W. Heller, W. Steele, J. Jancewicz, S. Zeman, D. Lowry, J. Lieberz) from December, 1976, to April, 1977, during three separate expeditions. La Grieta was surveyed Dec 1976-Jan 1977 by R. Jameson, P. Mothes, J. Smith, A. Cochrane, F. Binney, J. Horowitz, and B. Stone.

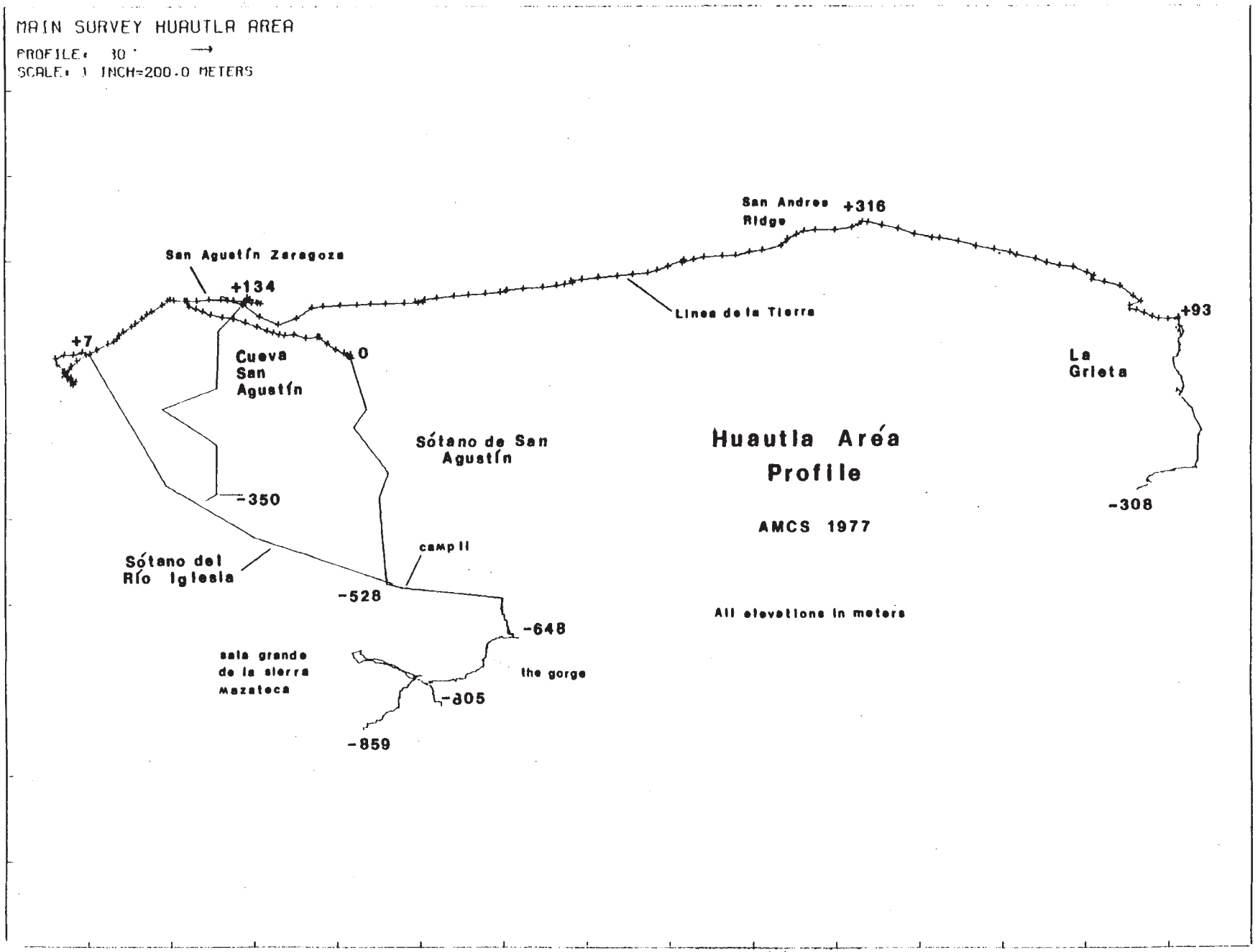
All other data for the plot (i.e., the long straight segments) was reduced from published maps for which we are awaiting the original notes.

Three notable observations can be made from the maps: La Grieta, thought to be a sure connection to San Agustin in January appears to be in a parallel drainage system, independent of the San Agustin system. Cueva San Agustin is very close to Rio Iglesia in two places. The downstream end of Rio Iglesia lines up almost exactly with the "upstream" dry trunk of lower San Agustin. A connection between Cueva San Agustin and Rio Iglesia would make that system 662 meters deep and almost 4km long. A double connection to San Agustin would make "La Sistema de San Agustin" 992 meters deep (5th in the world) and the longest cave in Mexico -- over 10 km. On the other hand, if La Grieta goes as deep as San Agustin and the higher sinkholes on the San Andres Ridge or on Cerro de Plaza can be connected, the "Sistema del Cerro de Plaza" would be approaching -1200 meters!

Bill Stone

We have just received a copy of the original survey notes for Sotano de San Agustin from John Fish. A new more accurate map of the Huautla Area should soon be available.


San Andres
sala grande mezateca
-805 m sump
-859 m sump
Sótano de San Agustin
the gorge
-848 m lake
'68 passage
camp II
Sótano del Río Iglesia
La Grieta
Huautla Area Survey
AMCS 1977
Plan Carlota
Cueva San Agustin
San Agustin Zaragoza
0
.5
1
Kilometers
MAIN SURVEY HUAUTLA AREA
PLAN ROTATED CW 60°
SCALE: 1 INCH 250.0 METERS


MAIN SURVEY HUAUTLA AREA
PROFILE: 30°
SCALE: 1 INCH=200.0 METERS
San Andres Ridge
+316
San Agustín Zaragoza
+134
Linea de la Tierra
+93
+7
Cueva San Agustín
0
La Grieta
Sótano de San Agustín
Huautla Aréa Profile
AMCS 1977
-350
-308
camp II
Sótano del Río Iglesia
-528
All elevations in meters
-648
sala grande de la sierra Mazateca
the gorge
-805
-859

Medical Report On The April 1977 Expedition to Sotano de San Agustin

More injuries due to caving were seen in my four weeks work at Sotano de San Agustin than I have ever seen before on any other expedition or long caving trip. There were some problems which I consider to have been handled very poorly. There were some which utilized outside medical assistance. But most problems the crew members took care of themselves. I learned from the help I gave and the observations made, and I would like to share my education with you.

A list of the medical problems is followed by the drugs and materials most commonly used. Most medical care was self-administered. I assisted only a few cavers.

The medical problems include abrasions, cafes, common cold, concussion, cramps, diarrhea, dislocated collar bone, facial lacerations, broken finger, hand sprain and puctures, headaches, hypothermia, insufficient insulin, loss of voice, nausea, ribs bruised, sore throats, urinary infection, and weariness.

A wide variety of antibiotics were taken due to the various types of infections displayed. Penicillin by injection was taken by one caver once a day for several days due to a severe sore throat suspected to be strep. Another sore throat accompanied by fever took Erythromycin and gargled warm salt water three times a day. Tetracycline (Achromycin) was taken for a fever and cold in another caver, for a sore throat in another, and by another speleologist to help control a urinary tract infection.

The sore throats were all easily acquired due to sloppy kitchen habits such as drinking from group water jugs. Weariness after long cave trips (20 to 30 hours), weakness due to other infections (colds), unaccustomed yelling up and down drops and going without insulin in the case of the diabetic lowered the bodies' defenses and allowed yet other infections such as sore throats to begin more easily especially toward the end of the expediton.

Two varieties of cold capsules were taken by various cavers. Contac was taken as a strong, sure symptomatic relief from the common cold. Ornex was taken when the caver planned to go underground because it contained no sedatives and no antihistamines which may cause drowsiness in some people. The obvious remedy - rest - was often ignored because equipment and trash was still below ground and there were several cavers anxious to finish de-rigging so that they could head back home. Hence they pushed themselves too hard. This was a skeleton crew; there were no extra cavers to help de-rig while the ill ones rested.

Lomotil was used by almost all the cavers. Diarrhea hit everyone sooner or later but I only heard of two people who were nauseated and only one of those developed stomach cramps which she suspects may have been due to the lomotil in the first place. Plain lomotil is best to use for simple diarrhea because its morphine-like action simply shuts down the intestine wall action and allows your insides to grow accustomed to the new bacteria invasion. Streptomagma, entero-viforma and lomotil with neomycin kill

off the bacteria in your intestine and should be used for severe diarrhea. But they kill both good and bad bacteria, so you should take the minimum amount needed and follow recovery with yogurt to return a few good bacteria to the plumbing.

Caution: Lomotil is a drug related to the morphine family of narcotics. Its activity is limited to relaxation of intestinal muscles because it is poorly absorbed from the gastrointestinal tract. Although little is known about this absorption process, there is evidence that children absorb Lomotil more efficiently than adults. This absorbtion will cause respiratory depression and can cause death. Young children should not be given Lomotil, and older children as well as adults (due to individual variation in absorption) should be carefully watched for signs of overdose. Initial signs include dryness of skin and mucous membranes, flushing, hyperthermia, and vapid heartbeat. These symptoms may begin as late as 30 hours after ingestion. The Physician's Desk Reference states, "LOMOTIL IS NOT AN INNOCUOUS DRUG AND DOSAGE RECOMMENDATIONS SHOULD BE STRICTLY ADHERED TO, ESPECIALLY IN CHILDREN." (Emphasis theirs.)

Terry Sayther

Vitamin pills (multiple, C, and B-complex) were available on a kitchen shelf in the house, but only four people took regular advantage of these extra nutrients. Extra vitamins and minerals are needed during times of something as trivial as tension and stress. Illness and excessive wear and tear on a system cause the body to need more than an average vitamin intake. Many meals prepared on the surface were lacking in the vegetable department. Small amounts of potatoes, tomatoes, raisins, plus a variety of fruits barely supply the daily minimum. Since every caver there was ill and worn and torn, everyone should have availed himself of the vitamin supplements.

Aspirin and non-aspirin were taken often. More than 50 Datril (non-aspirin) and over 100 aspirin were consumed for headaches, fever and soreness by the total crew of 19. There was only one caver with a migraine problem and he carried his own prescription. Several cavers who took aspirin would have been kinder to their stomachs if they had taken Datril instead but non-the-less some form of aspirin was needed and used.

Vaseline was used on caver's skin where wet-suits were expected to chafe or had chafed. More antibiotic cremes for bad wet-suit chafes should have been brought. Noxema was a good salve for rashes, chafes, dry skin and massages.

Elastic bandages were important items. The sprained hand and another hand (broken several months earlier) were wrapped in the two inch elastic bandages. They can also hold gauze pads on wounds. The broken finger should probably have been wrapped but was not. The trivial wounds which normally use bandaids were largely ignored. The large numbers of cuts and scratches made it impractical to try to cover each small opening in the skin. Hands became pruney and soft due to being wet for ten or twenty hours at a time and received cuts easily. Gauze pads were used on the facial injuries in the accident but did not see much use elsewhere.

One caver almost lost her voice and several sore throats were influenced by trying to communicate over the roar of waterfalls. More whistles could have been used to reduce wear and tear on throats.

Two people, each of whom did not wear a wet-suit, became cold enough during waiting periods on two separate occasions that preventive measures for hypothermia were taken. One caver wrapped up in a space blanket with other cavers who also wanted to get warm and kept a carbide light going inside this "tent" for more warmth. Another caver removed his wet clothing, put on a dry shirt and huddled over a carbide light. Many cavers sweated in their wet-suits when ascending but this is a small price to pay considering how cool the same people became when it was necessary to inactively wait for thirty minutes or more. Obviously this is a wet-suit cave and should be treated as such.

Urinating in wet-suits was a common problem for the speleologists unaccustomed to the subtleties associated with wet-suits. One caver was under the wrong opinion that urine is acidic whereas urine is basic due to the ammonia present. He rubbed spent carbide in the legs of his wet-suit in hopes of neutralizing the assumed acid. This compounded the basic problem since he was forced to wear his wet-suit the remainder of the trip. He received a burn on his thighs which turned into a severe skin abrasion which was actually bleeding before the trip was over. He walked bow-legged for two weeks afterward.

Weariness became a recognizeable malady toward the end. Personal problems slowed recovery from weariness but good group morale speeded up recovery. Group morale was boosted through social intercourse and group discussions in the evenings.

On one of the trips down to Base Camp II which involved carrying large amounts of underground camping equipment a caver neglected to clip a safety line leading across a fissure to the top of the 97 meter drop. When his duffel bag unexpectedly shifted it pulled him off the climb and he fell seven meters to a flat sand floor. He sustained a broken finger, bruised ribs, mild concussion, facial lacerations around the left eye, forehead and cheek and a dislocated collar bone. A broken back was at first suspected. The personnel nearest the accident were not sufficiently familiar with first aid and panicked. First aid measures were given for shock and facial lacerations. The surface was notified and then a long laborious rescue was begun. A strong pain reducer was administered. He was strapped to a backpack frame and pulled up each of the fourteen drops. An intravenous injection of vitamin C and calcium was given to reduce shock when the victim reached Sala Grande, a big room near the surface. On the trip out the collar bone apparently relocated itself. Once on the surface, he stayed in the Huautla hospital for two nights and then tried to finish recuperation in the house rented in the town of San Agustin. In the hospital the facial lacerations were largely ignored, so there will be some scars which could have been reduced if butterfly closures had been used, or eliminated if the doctor in Huautla had been capable of facial stitches.

Since hindsight has always been easier than foresight, here is my opinion on the rescue after having talked to many of the rescue crew after the fact.

An observation of a shoulder jutting up into the neck, a head twisted at a seemingly extreme angle and a cracked hardhat (Ultimate brand) with blood over the face, as the cavers present observed, would cause me to look for serious injuries. A suspected broken back (or neck vertebra) is serious. . . Real serious. Hauling a person out of a vertical cave from -365 meters is the last thing I would want to do, especially since there were several sleeping bags, food for six people for five days, stove and fuel, cooking pots, a flat dry area at the scene of the accident, and strong, competent cavers, two of whom knew a lot of first aid, only three drops away (97 meters,, 55 meters, and a 24 meter drop further). Two cavers were already down the 97 meter drop and were not explicitly notified of the accident.

If the victim had been seriously injured the rescue would have killed him. Dead. A backpack frame is useless when dealing with a broken back in a cave. It is not "better than nothing" because it gives a false sense of security. Hauling a person up drops in a cave is rarely a smooth operation. To subject a person to being pulled up drops for 20 hours is liable to drive them into shock if they were of sound body to begin with. [1, 2] The victim should have been bedded down while the most competent first aider available was summoned to the scene. Knowing now that he was not severely injured in the first place means that he could have prusicked out of the cave under his own power after a day or two of rest. He would not have subjected the rescuers to such pain, both physical and mental, as they underwent. The rescuers themselves needed various degrees of first aid after they were out of Sotano de San Agustin. The crew which was then at Base Camp II later suffered from the surface crew's weariness caused by the rescue.

Later, as one person left Base Camp II at -530 meters he somehow managed to drag the rope up the 97 meter drop without getting it back down. Two days later, after some of the crew had been underground for five days they decided to exit the cave for rest and more food before some of them returned for further exploration. One of the crew is diabetic and had used his last supply of insulin on the fifth day since he planned to re-stock on food and insulin before returning. Upon finding the rope missing from the longest drop in the entire cave, he returned to base camp and tried to maintain a reasonable blood sugar level while waiting for a caver from the surface to enter and re-establish the missing rope.

"Insulin is a hormone produced by the pancreas. . . This hormone is necessary for the body's proper use of food. . ." [3] Actually insulin is necessary for theorgans to properly use food. The muscles require a different hormone which a diabetic still produces. While waiting for the rope to reappear the diabetic ate very little food; only enough to keep his blood blood sugar level within reason. When the blood sugar level drops too low there is too much insulin and food is needed. At Base Camp II the problem was too little insulin and a high blood sugar level which meant the kidneys would overwork in filtering out the excess sugar and urination would be frequent and large volumed. For two and a half days blood sugar level was estimated by the frequency of urination. Every six to ten hours was

considered normal. The diabetic did not go on caving trips away from base came and slept as much as possible. Worrying was excessive by the third day since he had been told by doctors that a diabetic would stay alive five to eight days without insulin under ideal circumstances.
Once the rope was down the drop the diabetic was on the surface in six hours, tired, but estimating that he probably could have prusicked out under his own power even on the sixth day. Of course he would not have had any problem at all if he had had sense enough to bring extra insulin in the cave to begin with.

These are my observations and opinions which I share with you. I do not claim to be a qualified first aider. I do claim to periodically re-read and re-educate myself on first aid practices. Panic and wrong decisions are impossible to outgrow. We try to reduce their frequency.

Donald L. Broussard
the diabetic
Edited by Nancy Boice

1. Kodet and Angier, Being Your Own Wilderness Doctor. 1972.p.138.
2. American National Red Cross, First Aid. 1976. p. 60.
3. Eli Lilly and Company, Information for the Patient, NPH Bulletin. 1976. p. 1.

EVALUATION

ACCIDENT REPORTS: These accident reports have been compiled by the editor from interviews with those present. Every effort has been made to make them as accurate as possible, but in the brief space available all that has been attempted is a short factual account. Many other influences undoubtedly contributed to the accidents and their aftermath, such as the cavers' mental and physical condition, and their previous underground experience. But these factors do not lend themselves to brief analysis.

Sumadero Yochib

Jim Smith, Mike Van Note, and Bill Steele were establishing a "trail" along the main river passage in Sumadero Yochib. Smith climbed to a higher ledge and Van Note requested a handline. So Smith lowered a section of webbing and Van Note climbed up. Jim Smith then tied the webbing to serve as a fixed line. The webbing was looped around a corner so as to hang in the most advantageous place, and Bill Steele climbed to the ledge. On the next trip into the cave, Bill Steele climbed up knowing the line was looped around a corner. Mike Boon was immediately behind and when he grasped the webbing for an assist, the webbing popped off the corner and Boon swung out over the water. He was able to retain his hold on the line and avoid falling into the water upstream from the 40 foot Froth Pot drop.
Analysis: Care should be taken in rigging so as not to allow the rope to be pulled off corners and climbers should be aware of this possibility.

Bill Steele, Jean Jancewicz, Joe Lieberz, Mike Boon, Will Howie, Maureen Cavanaugh, and Carmen Soileau were exiting from the terminal room in Sumadero Yochib. Jean was leading, next was Bill Steele, and following him was Carmen Soileau. As Bill reached the upstream end of the Canal below the Stinger, he yelled back, "No carabiners. No carabiners." to tell Carmen not to clip into the line, as was done on the other canals. It was not possible to use a carabiner as two ropes had been used to rig the canal and they were tied in the middle with a knot too large to pass through a carabiner. This knot was located in a swift section of the canal where the flow of the current produced foot high standing waves. Carmen failed to hear Bill's warning due to the noise of the water and when she reached the knot she was unable to pass and was washed back. She moved forward again and was again forced back and under the water and came up tangled in the rope with her hard hat turned sideways. As she appeared to be tiring, Bill Steele jumped in and followed the line to Carmen. He talked her into releasing her carabiner and by breaking the force of the water was able to lead her past the knot. Carmen was weakened by the struggle and would have been in serious trouble if Bill had not been able to assist. After falling on the next ladder, she was belayed to Camp I where she rested for 24 hours.

Analysis: The rigging could have been improved so as not to use a knot, but the rigging team used the ropes they had. Perhaps a briefing before different sections would help, and the necessity of close attention to the problems of other cavers is pointed out by the incident.

Carmen Soileau, Cris Alvers, Warren Anderson, and Norm Pace were on a trip to lay a phone line to Camp I in Sumadero Yochib. Norm Pace had climbed down a ladder and was reeling out the phone wire while clipped into a canal rope. This rope was strung between the end of the cable ladder and a bolt above a waterfall at the downstream end of the canal. The bottom of the cable ladder was held in place by passing the ladder through an unlocking carabiner attached to a bolt at the bottom of the ladder. As Norm Pace strung the line the buffetting force of the water popped the rope out of the carabiner, giving enough slack to drop Pace over the lip of the next falls where the force of the water held him against the end of the rope beneath the water. At first up-side down and unable to breathe, he was able to right himself and in the process created a breathing space where the water arched over his hard hat. The people at the end of the rope tried to free him but were unable to budge him against the force of the water. He was held below the surface of the water and the team above could see only his electric light glowing beneath the water. Pace hung in this position for 15-20 minutes. They finally considered him dead. The rope was then loosened from the top bolt. This additional slack enabled Norm to escape from the water. His calls were heard from above and first thought to be another party coming out of the cave.

Analysis: Locking carabiners should be used on all rigging where there is any possibility of the rope being popped through the gate of the carabiner by intermittent loads.

Jim Smith was following Blake Harrison and Jill Dorman on Jim's first trip through Sumadero Yochib. About one hour into the cave the group began to cross the pool above Fool's Falls. This pool is about 20 feet in diameter and is connected to the falls through a narrow channel of swift water. This section is normally traversed by climbing down a cable ladder into the pool, then following a line across the pool and climbing up to a ledge where the line is tied. But to some this is not the obvious way to go -- following the water looks like the way into the cave. Once a caver enters the narrow channel, it would be impossible to hold against the swift current which would sweep the helpless caver over the 70' Fool's Falls. When Jim Smith carrying 5 cable ladders reached the pool, Blake and Jill had climbed to the ledge and were not visible from the pool. Jim started to enter the narrow channel, but had second thoughts and braced himself across the narrow entrance. As Jim considered entering the channel, Blake came back and yelled to him to climb to the ledge, which he was still able to do.
Analysis: A potentially serious situation was caused by Jim's unfamiliarity with the cave and lack of guidance from the rest of the party. As everyone cannot be continually supervised, perhaps a pre-trip briefing would be advantageous.

Sotano de San Agustin

Jim Smith, Blake Harrison, Jill Dorman, Bill Steele, and Jean Jancewicz were the last of several groups carrying equipment down to Camp II in preparation for a long stay in the cave. Bill and Jean had traversed a ledge and descended the next drop -- a 318 foot slightly inclined fissure. Jill and Jim were waiting as Blake began the traverse, moving himself and a heavy duffle bag along, but not tied into a fixed line. When Blake came to an awkward spot, he stopped to ask advice, whether to clip himself and the approximately 40 pound duffle bag to the line. As he asked, the bag shifted and Blake and the bag fell 20 to 25 feet on to a sandy floor, bouncing off the wall on the way down. Blake suffered a broken finger, lacerated face, cracked rib, and probably a concussion. After the fall, it appeared he might have a broken back, broken pelvis, a skull fracture, and his collar bone appeared driven into his neck. Blake compained of neck pains as well as general pain throughout his body. His hard hat, an Ultimate, was fractured, and undoubtedly helped reduce his injuries. Blake was securely tied to a pack frame and moved up 15 drops -- approximately 400 meters vertically to the surface.
Analysis: It is probably best to plan difficult traverses before the attempt and if lines are properly rigged, they can offer safety. Whether immediate removal after an accident is desirable has been debated. Perhaps if the victim is suffering mainly from shock, it might be desirable to keep him comfortable until he recovers and can aid in his own rescue. However, there are medical problems that require immediate attention.

Jill Dorman and Jim Smith were on the way out of Sotano de San Agustin on a derigging trip. On the second drop below Camp I in the fissure series, Jim was free-climbing a rigged drop with 500 feet of coiled rope when he fell from about ten feet up the climb. He landed on a sandy floor on hands, feet, and head, apparently suffering no serious injury. However, as he climbed toward the surface, the pain in his hand grew worse, and later it was found he had broken a small bone in his hand.
Analysis: Extra care should be used when carrying heavy loads, and deriggers should resist the temptation to free climb.

Editorals

It is always painful and usually unpopular to voice criticism in our organization, but certain events in the past year merit the attention of the whole clan as they may indeed be the sign of what's to come.

AMCS cavers have traditionally been one of the best groups of vertical enthusiasts in the United States, not due to an attempt to form an exclusive club, but because all were drawn in different manners by the spectacular challenge and excitement of deep Mexican caves. Until as recently as two years ago nothing had come along that our well tested single rope techniques couldn't handle. Many cavers lapsed into an euphoria of disconcern for danger that was bred by technique familiarity. Even Golondrinas can be a "whimp drop" after 4 or 5 times (viz. nude, upside down, by lawn chair, and 5 minute descents!). Unfortunately most of the "leader types" got sucked into this syndrome of ignoring danger.

The second problem to arise came from the need to fill ones speleo vehicle with sufficient cavers to defray the outrageous cost of gasoline and maintenance. This usually results in rather unbalanced expeditions with everyone from novice to expert and the neighborhood dog. Seldom is there going to be a trip with an "ideal crew". An ideal crew is one in which: a) Everyone is socially and psychologically compatible b) Everyone has roughly the same magnitude of caving ability.

Normally, small deficiencies in either of the afore mentioned attributes of the crew have little affect on the outcome of a trip. However, when the caving becomes demanding to the limit, variations in that "ideal crew" can blow the lid on safety underground. The past two years have seen a tremendous upsurge in very deep caving. Great depths, and more importantly, large quantitites of moving water are changing the rules of the game. Sooner or later we will have to learn to play by the rules or someone is going to buy it.

Almost all the accidents of this past year stem from the above mentioned problems. Norm Pace's near catatrophe in Yochib would never have occurred had there been a locking carabiner on the bolt. But how could anyone have known that it would happen since that manner or rigging had "always" been" dependable before? The lack of equal caving ability, or unfamiliarity with a crucial move, has been responsible for two of the deepest rescues in the western hemisphere. "Sheila Feels" in Conchas should have had a handline rigged before the accident occurred. Those of us in the lead were not thinking. Our eight person team was clearly divided in ability. Failure to recognize this and rig accordingly finally caught up with us. Those that have recently done the trip to San Agustin's Camp II know the trite awkwardness of the tyrolean from the bottom of the 140' drop to the top of the 318'. Considering the heavy traffic of cavers with bulky packs enroute to Camp II, it was only a matter of time before someone unfamiliar with

the spot would make a small slip. I know I had a bear of a time getting a wet 50 lb. duffel down to Camp II.

In mentioning these accidents, I am in no way attempting judgement. The point is that several lessons can be learned from our mistakes. Hopefully all will benefit from the close calls of a few. As new areas like Zoquitlan open up, it appears that wet caving is here to stay. Those with experience in such caves would do well to discuss wet-cave rigging with the rest of the clan. Knowledge of when and when not to use a jumar safety on a handline in rapids could make the difference between blissfully skimming up stream or being sucked under.

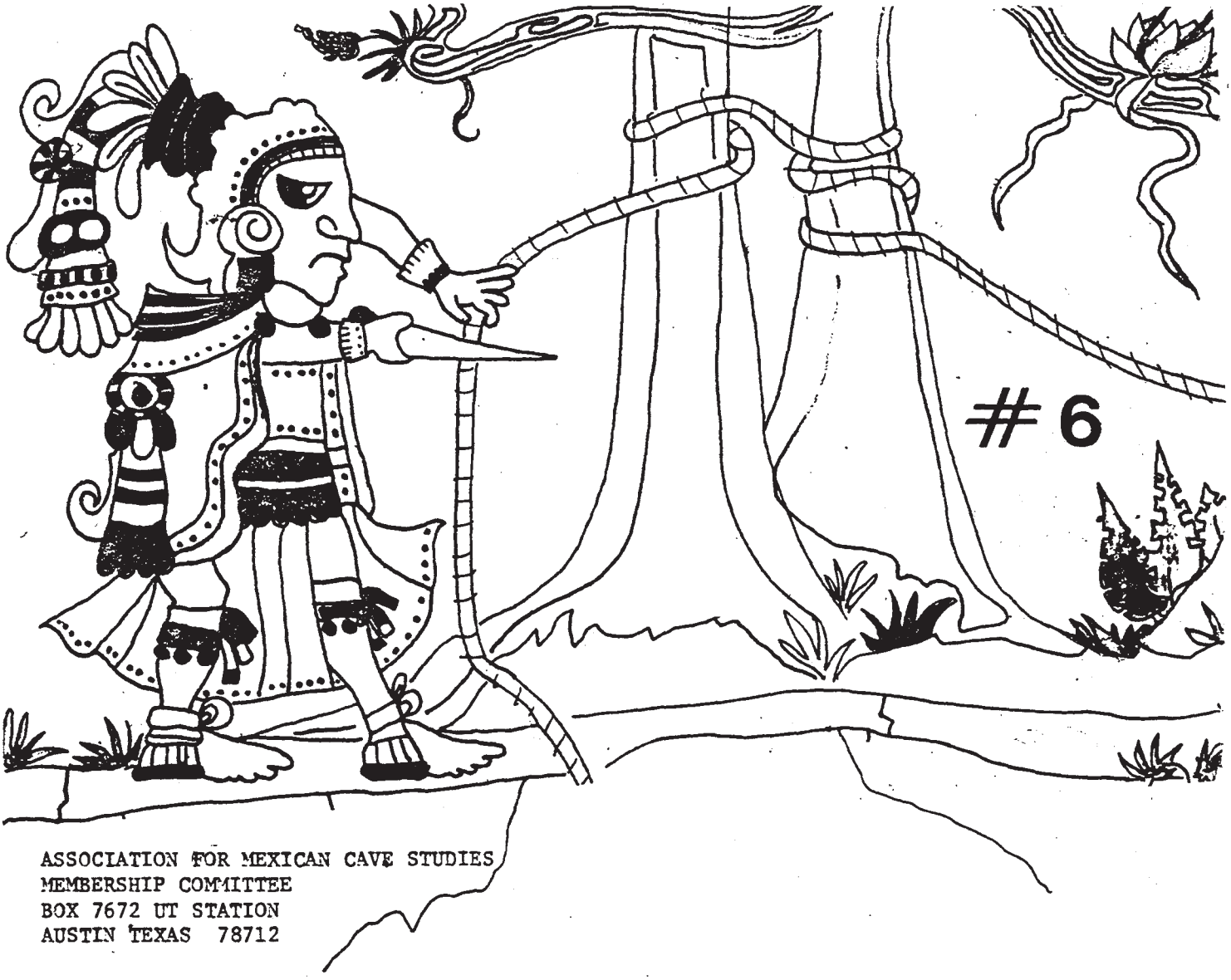
Deep push crews and support teams need to be tight units - as close to the "ideal crew" as possible. One person's ill temper toward the others in a tense situation can affect the psyche of the whole team. Great strength comes from camraderie. Strength also comes from continuity. If one or two people are always rushing on ahead, who will be there to throw them a line as they are being swept over the falls? Group decision making is always better then blindly accepting the most fanatical view. As the holes get tougher then we had best get tough on safety.

Bill Stone

Sotano de San Agustin is perhaps the most beautiful cave in North America as well as the deepest, and so is destined to be frequently visited. If each person left even a small amount of trash, the cave would soon resemble a garbage dump. Each group entering the cave should be strong enough to remove whatever they bring in. If the energy or time does not exist to remove the trash from the cave, clearly the group is operating dangerously close to their limits; and has no capacity left to deal with the inevitable minor problem, much less a serious injury. There is no depth below which caving is so difficult and demanding that leaving equipment behind is a necessity, as all caving needs a margin of safety. Of course, in the case of an accident or serious problem, people come before equipment but leaving material in the cave should be a rare occurrence. Every trip should budget their time and man power to remove their equipment. Those who want to preserve the cave should not have to remove the trash left by others.

The AMCS stands behind the feeling that conservation practices should be maintained regardless of how deep a cave is or in what country a cave is located. We feel appalled that established speleologists would turn their heads away from accepted conservation policies in favor of an easier exit from the cave. Sotano de San Agustin, the deepest cave in the Western Hemisphere was left littered with abandoned bags, personal gear, uneaten food, and rubbish. Those who left this material were fully aware that other members of the expedition were against such practices but proceeded contrary to these wishes. Sotano de San Agustin was derigged by a skeleton crew of AMCS cavers. All material abandoned by the 1977 expedition, all left by the 1976 Mexican party, and all abandoned by the 1968 Canadian expedition were cleaned up leaving a clean cave as our deepest one.

AMCS



ASSOCIATION FOR MEXICAN CAVE STUDIES
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AMCS ACTIVITIES NEWSLETTER

no. 7

AMCS ACTIVITIES

NEWSLETTER

Number 7, Nov. 1977

Editor: William Russell
Staff: Gill Ediger, Margaret Hart, Peter Sprouse, Bill Steele, Bill Stone, Terri Treacy

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Copies of the AMCS Activities Newsletter Number 6 can be obtained from the above address for $2.50 post-paid. Back issues Numbers 3 and 5 are still available for one dollar each. The next issue of the Activities Newsletter will cover the Thanksgiving and New Year's trips and should be available this Spring.

With this issue the format of the AMCS Activities Letter has been changed. The publication will continue with the name AMCS Activities Newsletter. Each issue will be larger and they will be sold by the issue. This new format will allow more photographs, longer articles and large maps. Articles and trip reports are solicited from all who cave in Mexico.

Front Cover: This spectacular photo of Cueva de Infiernillo was taken by Charles Fromen of Houston. To obtain the picture the photographer had to climb a tall tree in the arroyo.

Back Cover: "Long Drop" in Sotano de los Lobos, S.L.P. by Bill Stone

Correction: Cover photo on AMCS #6, Sumidero Yochib, was by Norm Pace. Our apologies to him for miscrediting his photo.

ASSOCIATION FOR MEXICAN CAVE STUDIES

International News

THE SIERRA DE GUATEMALA caves have been closed, report the personnel at the Rancho del Cielo Biological Station. The newly formed ejidos on the mountain delivered a letter to the station last fall protesting visits by cavers in the last several years who had not secured permission in the villages. The biologists suggest that permission might still be obtained to cave by requesting such from the proper officials and carefully explaining the purpose of the visits, which has apparently been misunderstood. This does not affect Joya de Salas where arrangements are the same as always. All this suggests that caves could be closed in even the friendliest areas if your presence and purposes are not explained to the local officials. It is likely, however, that this incident is in part related to the recent formation of the ejidos and their corresponding assertion of power.

THE ITALIANS have surpassed Mexico in depth. A new upper extension in Antro de la Corchia pushed it to a depth of 935 m. (Paul Courbon)

BRAZIL'S LONGEST CAVE, Gruta de Sao Mateus, is now 20.5 km in length. (Paul Courbon)

WHERE DOES SAN AGUSTIN STAND: Paul Courbon writes that Sótano de San Agustín, -859 m, is probably the 14th deepest cave in the world. Apparently there are some problems with the surveys with other deep systems. The Sima GESM, Spain, is reputed to be 900 m deep but has only been surveyed to -415 m. In the Garma Ciega - Sumidero de Cellagua system (also Spain) the bottom survey at -970 m is lower than the known resurgence and an error of 40 m has been discovered by Polish cavers in the first 500 m of depth. And finally the depth of Austria's Hochlecken-Grosshohle, -877 m, is in question by a 20 m difference in two surveys in the first 150 m. So, amongst all that is where San Agustin stands.

A NEW U.S. DEPTH RECORD has supposedly been established by a connection between California's Bigfoot and Meatgrinder caves, combined to be 363 m deep (Neff's Canyon cave, which has held the record for over 20 years, is 357 m deep). Hopefully, we will have a verification of this in our next issue.

IT WAS A GOOD TRY, but members of the Independent Grotto of Arkansas (non-NSS) "fell" somewhat short in trying to show a writer/photographer for Outside magazine the proper techniques of caving. Outside is a new magazine by Rolling Stone whose purpose is to purvey outdoor activities to the mass public. As the grotto was leading the writer through Rorie Cave, IGA member David Smith attempted to climb to a high lead above a pit without a belay and accidently peeled off, hitting two ledges before landing 40 feet below (suffering bad cuts and bruises). Oh well . . .

CB RADIOS, which have been illegal to use in Mexico, (see Activities Newsletter #5) are now permissible. The change of policy came about in November 1976 - apparently the government decided that tourists needed CB's to summon the "Green Fleet" (tourist patrol) when in trouble.

FOOTPRINT CAVE is now Belize's longest at 4 km. The survey is part of

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Tom Miller's master's research at McMaster University.

THE RUMOR we reported in issue 5 of a very deep Canadian cave has turned out to be little more than that - a rumor. The cave, D6, has actually been surveyed to +110 m by the Vancouver Island Cave Exploration Group. Meanwhile, Canadian caver, Paul Griffiths, apparently checking pits above the cave in hopes of a connection, has generated publicity in the new media claiming the existence of a 900 m deep cave. Sounds like counting your chickens before they hatch.

IN THE SAME VEIN, the first issue of the new Belgian publication SPEALP reports that Greek cavers have found a new deep shaft called Propantes. The Greeks claim it has a minimum drop of 418 m (El Sotano is 410 m) but they apparently have not even descended it yet!

THE 1978 NEW GUINEA EXPEDITION will return to the Atea Kanada river sink, reports Dr. Julia James of Sydney, Australia. The Atea Kanada is an awesome river cave with a low water flow of 12 cu-mecs (Yochib averages 1 cu-mec, or m^3/second), located on the remote Muller Plateau in Papua New Guinea. The Atea Kanada has a steep gradient and it is likely that many vertical pitches will be encountered in the exploration; these may have the full force of the Atea River flowing over them. The required perserverance to explore this ultra-technical cave is matched by its world-record depth potential from sink to resurgence. The Aussies are planning on fielding up to 60 people, including 30 active cavers, for 2-1/2 months. Anyone for a swim?

A 1000 METER SHAFT has reportedly been found in Austria. It has a large waterfall entering 150 m into the drop. A 500 m cable with 22 kg weight "swung free"in the shaft and based on this they estimate a drop of 500-1000 meters. It is so far undescended. (Jim Smith)

THE 1977 AMERICAN EXPEDITION TO GREECE has returned and correspondent, Jim Smith, has sent details of exploration on the Astraka Plateau. During the first two weeks they descended 25 pits in the 20-60 m range and extended "Hole of the Married Women" an additional 8 m past where the Brits claimed the passage was too tight! This impressive cave begins with three spectacular drops: 131 m, 52 m and 91 m, all free. In another area the group descended two more impressive virgin pits: Tripa Spera 63 m and Tripa Opedius 132 m freefall.

The group then hiked up the Provetina area and descended both Proventina and Epos Chasm. Smith describes Proventina "the first drop is 165 m sheer to a ledge. The next drop is 207 m freefall - a massive shaft." This totals to 372 m, less than the 376 m drop in Golondrinas.

Winding up the trip, they bottomed 158 m deep Gailo Tripa near Elephantopos, a large pit the Brits had located, but had descended only 30 m.

TAG BRIEFS: Alabama's Small Cave has been pushed to a depth of 156 m, making it the second deepest cave in the state just behind Fern.

Pushes by Marion Smith, Richard Schreiber, et al have led to a 3-1/2 second freefall pitch in Bloodstone Cave, noted for its shaky breakdown

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in the entrance area. The latest attempt ended with Smith dangling at the end of a 75 m rope in a respectable sized waterfall - the drop still goes! Cavers are hopefull to connect this with Scotts' Barn Cave lower on the mountain for another 150 m+ cave.

E.T. Davis and crew are working on connecting Odyssey Cave with Elno's Canyon, another potentially deep system for the east. (Marion Smith)

ACCIDENT IN HUNDIDERO-GATO (Summary translated from the GESM Journal-Malaga, Spain) Ten to twelve hours inside Hundidero-Gato, a large Spanish river cave, the group encountered a heavy rapid. Jose Manuel Vera tied in and attempted to attain a ledge on the apposite side. The force of the water proved too much and Vera was carried downstream. At this point he called for help. His belayers pulled with all the force they could, but succeeded only in pulling Vera beneath the surface. An attempt was made to reach Vera on another line but the rescuer immediately realized he had no chance against the current, and it took 15 minutes of "titanic effort" to retrieve the rescuer. The group again tried to pull Vera out, until everyone had bloody hands. Finally the rope went slack and Vera's body disappeared. The overextended group then retreated to a dry chamber where they waited 2 days for the rescue party to help them out.

Overextension: just where is it when you've gone too far to get back again? When you can go down in a cave gravity helps you along. Drops are down. The biggest worry in rapelling is in going down too fast. But coming out is up. It's not easy and it's slower. Up ropes, up climbs and upstream.

Streams add an additional factor. Their currents flucuate in strength with the width of the walls. Judgement must be sound in any spot dealing with a strong current or rapids. The Spaniards have learned a hard lesson. We've done a couple of large descending river caves in Mexico and have been fortunate in judging obstacles correctly. There have been close incidents to be sure. But hopes are that we'll never have to write a report like the one above.

SILVERTIP SUMMARY: With the 1977 summer season AMCS cavers again set up an extended camp beneath Silvertip Peak in the Bob Marshall Wilderness Area of Montana. The primary objective, Meanderbelt Cave, was explored to roughly -246 m before the passage pinched. Exploration of this cave the previous season had stopped at a deep pit, thought to be a sure connection with Getout Cave. This connection would have yielded the deepest cave in the United States. Undaunted, the cavers located Hole in the Wall high on the south side of the peak. This cave was pushed to an ice plug terminus at 118 m. The "dig" continued in Sunray Cave's amazing phreatic tube. After many sessions Mike McEachern finally broke through to a lower entrance - Sunset Cave. During the last few days a new cave was discovered between Meander Belt and Sunray which was pushed to -124 m despite its very narrow dimensions. The cave continues and may connect to the system, but due to the lateness of the season and difficulty of exploration it was left for the following year, hence the name Cop-Out Cave.

The Ten Longest Caves in Mexico

by Peter Sprouse

1. SOTANO DEL ARROYO, S.L.P. 7200 meters
   First reported by F. Bonet. The survey was begun in 1971 by AMCS members, and the present length was reached in 1972.

2. CUEVA DE KAUA, Yucatan 6707 meters
   A large maze cave, the extent of which is not known. Survey begun by the AMCS in 1973 and reached its present length in 1975.

3. SOTANO DE SAN AGUSTIN, Oaxaca 5900 meters
   Also Mexico's deepest cave. Survey initiated by AMCS cavers in 1966. In 1968 a group of largely Canadian cavers (MUCCC) pushed the cave to an apparent end at 1860 meters. However, in 1976 AMCS cavers from Georgia opened up a new passage and subsequent mapping by the AMCS has brought the cave up to its present length.

4. GRUTA DEL RIO CHONTALCOATLAN, Guerrero 5600 meters
   A large river cave parallel to Gruta del Rio San Jeronimo and below Gruta Cacahuamilpa. Surveyed by an AMCS team in March and April of 1974.

5. GRUTA DEL RIO SAN JERONIMO, Guerrero 5600 meters
   Large river cave, slightly less in length than nearby Gruta del Rio Chontalcoatlan. Surveyed by the AMCS in April of 1973.

6. CUEVA DE CHICHICASAPAN, Puebla 5235 meters
   A complex stream cave, surveyed in 1977 by Mexican, British and American cavers. Additional passage has been explored but not surveyed.

7. CUEVA DEL BRINCO, Tamaulipas 5200 meters
   Dipping complex cave, elevation 1900 m. Survey begun in 1973 by AMCS and is continuing.

8. GRUTAS DE JUXTLAHUACA, Guerrero 5098 meters
   Sections of this cave are commercialized by the federal government. Survey by AMCS members in November 1971.

9. CUEVA DEL NACIMIENTO DE SAN ANTONIO, Oaxaca 4570 meters
   This large resurgence cave was mapped 1973-1975 by the AMCS. It is notable for its spectacular cave biology.

10. CUEVA DE LA TINAJA, S.L.P. 4502 meters
    Closely related to Sotano del Arroyo. Partially mapped in 1947 by zoologists from the American Museum of Natural History, the AMCS surveyed the cave in the mid-1960's.

The Ten Deepest Caves in Mexico

by Bill Stone and Peter Sprouse

1. SOTANO DE SAN AGUSTIN, Oaxaca 859 meters
   Survey began in December 1966 by an AMCS team which carried the survey to -280 m. In December 1968, a group of Canadians and Americans pushed the cave to a siphon at a depth of 612 m. Eight years later AMCS cavers from Georgia pushed a side passage which was explored to -648 m. Another AMCS team surveyed this passage to -760 m while exploring on to the -800 m level. In March, the current deepest point was reached when the explorers encountered a siphon in another passage at -859 m.

2. LA GRIETA, Oaxaca 665 meters
   AMCS cavers first began the survey of this cave in December 1968, reaching the 90 m level. In December 1976, a larger team surveyed to a constriction at -401 m. The survey was continued in May 1977 to a depth of 665 m and a length of 4200 m.

3. SOTANO DEL RIO IGLESIA, Oaxaca 535 meters
   Surveyed in December 1967 by Canadian cavers (MUCCC). The largest of all the pitches in the cave, the Christmas Shaft, is 142 m. The cave ends in a mud choke.

4. SOTANO DE NOGAL, Queretaro 529 meters
   Mapped by an AMCS team in May 1976. After 20 pitches the cave ended in a mud floor.

5. SOTANO DE LAS GOLONDRINAS, S.L.P. 512 meters
   A large open air shaft, with a free drop of 333 m from the low side and 376 m from the high side. AMCS members surveyed the pit in June 1967. In December 1969 a fissure was discovered in the floor by Indiana cavers which was then surveyed to -512 m.

6. HOYA DE LAS CONCHAS, Queretaro 508 meters
   Mapped in March 1976 by a large AMCS expedition. Bottomed at a siphon which was dived to a depth of 4 m but it continues down.

7. SOTANO DE BUQUE, Queretaro 502 meters
   Surveyed by an AMCS team during the summer of 1972. Exploration was stopped at a sump which has not been dived; the map of this cave has not been published.

8. CUEVA DE DIAMANTE, Tamaulipas 466 meters
   AMCS surveying teams mapped this Sierra de El Abra cave to -120 m in December, 1974. In March of the following year the depth was extended to 300 m, then in 1976 to -466 m. Exploration in this cave is difficult due to very tight canyons.

9. HOYA DE LAS GUAGUAS, S.L.P. 464 meters
   Another large pit similar to nearby Sotano de las Golondrinas. In June 1968 AMCS cavers surveyed it to a depth of 422 m. Additional mapping in July 1977 through a lower breakdown section to a siphon showed it to be 464 m deep.

10. CUEVA DE SAN AGUSTIN, Oaxaca 458 meters
    Surveyed by AMCS cavers in December 1969 to the bottom at -484 m, but this map was never published. In December 1970 MUCCC cavers resurveyed the cave, obtaining a depth of 458 m. An overland survey in 1977 to a higher entrance may add 20 m of depth.

Ten Days in La Grieta

AMCS Huautla Expedition, May 1977

by Bill Stone

During the past year the Western Hemisphere depth record has been broken no less than three times during three separate major expeditions to the same cave: Sotano de San Agustin. The terminal sump at -859 m, reached by the March expedition marked an end to exploration in the lower system short of using diving equipment. The quest for the first 1000 m deep cave outside Eur-Asia could now only be realized by a connection with a higher entrance.

During the January and March expeditions we connected all the area caves via an overland survey. From the computer plot of this data La Grieta stood 93 m above Sotano de San Agustin. However, the big revelation was the surprising density of caves around the village of San Agustin. Cueva San Agustin (-484 m) was 134 m above Sotano de San Agustin and appeared to be a sure connection to nearby Sotano del Rio Iglesia (-535 m). Rio Iglesia on the other hand, came very close to the upstream trunk in Sotano de San Agustin. A double connection would yield a system 992 m deep. Hence the plan was formed. The team would "warm up" checking the Cueva. If no connection was made we would move into Camp I at -300 m in La Grieta.

THE WARM UP: We arrived in San Agustin on May 17 and set up operations in the two story fieldstone house used by the three previous groups. Cavers on the expedition were Gary Stiles (AZ), Tracy Johnson (AZ), Ernie Garza (CA), Steve Zeman (TX), Jeff Horowitz (TX), Bill Steele (TX), Cathy Rountree (IN) and myself.

After sorting ropes and equipment for the 19 known drops in Cueva San Agustin we split into two groups. The rigging and scouting team consisted of Zeman, Horowitz, and myself. We were given a 6 hour lead to rig to the bottom (-484 m) and would be followed by Steele, Garza, Johnson and Stiles who comprised the push/de-rig team. Unlike most of the area's deep systems which lie at the bottom of immense dolines and take active surface drainage, Cueva San Agustin sits high and dry on top of a rounded hill. From an exploration viewpoint this allowed for a rapid trip as bulky wetsuits and heavy-water gear could be left behind. While rigging we found it advantageous to sling each persons' ropes with a long tether rather than attempt to carry eight coils over our shoulders. Each rope was labelled for the drop it was to rig in the known parts of the cave. Four other ropes were designated "push" ropes and could be cut to length for new drops should the cave go. At about -300 m we noticed a high lead, 10 m off the floor at the top of an overhanging flowstone wall. With some difficulty I managed to freeclimb it, and followed the passage 150 m or so

8 Previous page The 60 meter drop beneath Camp I in La Grieta. (Bill Stone)

to a drop. I returned and dropped a line to Zeman and Horowitz. In short order we bottomed the 20 m pit--no go. We did, however, discover several clusters of 20 cm selenite needles on the sandy floor. About this time the push crew arrived. While they surveyed the new passage we continued rigging and lead checking. The final (19th) drop in the Cueva is a spectacular 110 m, mostly free drop into an immense room 200 m long and 50 m wide. We circumnavigated the room with both teams checking every conceivable hole. No leads were found so we began derigging. At first, each person could carry a coil or two up the rope with him. More tackle amassed at each drop and we wer forced to hoist equipment out the final 4 pitches. Each major drop would find someone sleeping while waiting for others to finish climbing. We exited the cave with all equipment 24 hours after entering. No connection had been made.

After a day's rest we commenced operations at La Grieta. Formal permissior was obtained at Plan Carlota precluding further political problems. This however, did nothing to assure that the rope would not be cut and stolen by some needy Indian. We proceeded to develop two escape routes. In December voice communication had been made between a small crawlway, some 15 m from the usual rig (chop) point, and the main 60 m entrance shaft. After some poking around Horowitz and Johnson managed to freeclimb to the bottom. This new entrance, dubbed the Hobbit Hole, was our main insurance. To be doubly safe I pendulumed

The La Grieta camping crew with full camp and cave gear. (Jeff Horowitz)

The rigging team of Stone, Horowitz and Zeman with the ropes for Cueva de San Agustin. (Gary Stiles)

some 5 m under the entrance lip and bolt rigged the first drop. This being done, we untied the rope from the boulder above leaving an "invisible" rope. In an emergency, the most agile lead climber could then freeclimb out from the bolt. While all this was being done the rest rigged down 11 drops and 4 tyroleans to Camp I. The tyroleans were added as a safety precaution for hauling heavy loads on otherwise simple traverses.

INTO CAMP I: The next two days were occupied preparing packs, sorting food and resting. Menus were planned to sustain six cavers in Camp I for seven days. All the food was laid out and split up, leaving each of us to decide upon the best way to carry the burden. More equipment: full wetsuits, double Ni-cad electric packs, and dozens of cool-lites for the heavy-water we were expecting. A massive bolt kit, first aid kit, close to 30 pounds of carbide, fiber-fill sleeping bags, large Yucatan hammocks and wool campclothes--all were methodically stuffed into ever expanding duffel bags. This was topped off by the standard array of vertical gear, plus extra ascenders, carabiners, carbide lamps and webbing. All this added up to packs weighing between 50-70 pounds.

By morning, May 23, all was ready. All equipment was shifted from the house to the truck for the ride to San Andres on the western edge of the San Agustin Dolina. Camp bags were lashed to pack frames for ease of transport

to the entrance. From San Andres we slowly descended the winding trail to the base of the La Grieta doline, 300 m below. Then, like a precession of ants, we rappelled in. When the last man was down, Horowitz pulled the entrance rope out and hiked back to San Agustin. This surely must have amazed the small crowd of locals there!

Following experience learned during the two previous camping expeditions, each caver was self contained for 7 days underground: i.e. food and equipment were divided so that if someone could not get to Camp (as happened due to the accident on the March expedition) the others were not left without some essential item. To aide in transporting the heavy packs we attached a 2 m webbing tether and suspended it off the rappel rack carabiner. This way one could rappel down awkward pitches with minimal difficulty. Other times the tether aided in dragging the pack through a tight crawl or lowering it down short climbs.

Within four hours we arrived at Camp I. It was 5:30 p.m., and the general consensus was to establish camp, eat dinner, and begin the push next day. Camp I was situated at the bottom of a 55 m drop, approximately 300 m below the entrance. The dry fissure passage averaged 4-5 m in width and was broken into three 10 m long tiers by 5 m climbdowns. Beyond the last tier the passage plummeted into a 60 m shaft. The hammocks had proven a wise decision as there were few flat spots for sleeping. Once everyone had set bolts for their hammocks we surveyed the area. Certain essentials had to be taken care of if camp was to be functional. A kitchen area was designated, then food was inspected for damage and stored in a nearby alcove. Water was obtained from a flowstone drip some 30 m down the passage from the kitchen. The BOG (outhouse) was dug in a small sand-filled chamber 15 m from the water supply. This done, two of us rigged the 60 m drop while others cooked dinner.

The following morning we split into two teams and left camp after a hearty meal of granola, dried fruit, milk and tea. Steele, Zeman and I formed the rigging and exploring team, while Johnson, Garza and Stiles brought the survey along behind. We quickly negotiated the 1/2 km of known passage below the 60 m pitch. Virgin cave lay beyond. Our six man team, a tight procession until then, broke into the designated groups. The cave continued as a narrow vadose passage with sharp solution carved blades projecting from the walls and floor. During the future trips this passage became known affectionately as the "Torture Chamber." Five hundred meters further on, the ceiling lowered to a pool with 25 cm airspace and finally a 20 cm crack. Zeman and I hammered on the crack for over an hour before Steele managed to squeak through. All this work was to no avail as 60 m further on he got to a 12 cm crack. Somewhat reluctantly we headed back to deliver the bad news to the survey team. At one room along the way I stopped to check a small fissure leading downward. This quickly led to an active stream dropping down a new series of cascades. After assuring myself it continued I returned to find the survey party had shown up. A brief conference ensued. They elected to continue surveying to the pinch while we pushed the new lead. With Zeman at the point we traversed an amazing series of canal swims and exposed climbdowns through cascades. For the next 2/3 km the passage alternated between large steeply sloping breakdown floored rooms, sometimes reaching dimensions of 30 m wide and 15 m high, and long stretches of narrower canals and cascades. Usually each large chamber would be preceded by a termination of the water passage and a 10 to 15 m climb through breakdown. Throughout this entire

stretch only four pitches were rigged, none of which were greater than 15 m. We soon arrived at a complex breakdown blockage where two major cave streams disappeared. An additional 3 cusec (ft^3/sec) stream had entered via a narrow fissure shortly before the blockage. Steele managed to find a route through the maze which led to an L-shaped breakdown room. He located a stream which sumped after a short distance. With no obvious leads we returned to meet the others. At the Junction Room we found Garza patiently waiting. Johnson and Stiles had a hot lead and were off pursuing it. They soon returned jubilant over a new going passage which had led to a 15 meter pit with a large amount of water dumping in. Matching descriptions led to the conclusion that their waterfall drop intersected our route just before the first big room. We dropped all extra push tackle at the Junction Room and began a retreat through the Torture Chamber. When the last man prusiked the 60 m pitch it ended a 15-1/2 hour trip.

We awoke at 4 p.m. on May 25th. Our time schedules were already starting to shift. At breakfast everyone chowed down to the usual granola and fruit plus an extra quart or so of mashed potatos to boost carbohydrate levels. Each of us methodically re-loaded carbide bottles, checked electric lights, picked up new cool-lites and survey gear. Groans could be heard from the lower tier as Johnson, Steele, and Garza crawled into their cold, slimy wetsuits. One by one we racked in and began our daily commute to work. We rythmically strided through the Torture Chamber, each move and key hold being memorized for the long trip out. At the Junction Room we again split into two 3-man units. Steele, Johnson and I were surveying from there through the Stile-Johnson route to the lower cave. The other three were to rig ahead through the large cascade and photograph down to Mazateca Shores, the sand-banked room just before the breakdown maze which had stopped us on the first trip. We arrived at the 15 m cascade drop expecting to see an elaborate bolt rig for a free dry rappel. Instead we found the rope leading directly down the 4 cu-sec chute. This proved sporting enough to be of interest and a pleasant cooler to our over-heated wetsuits. We christened it The Refresher. After eight hours of surveying we caught up with the photo crew at Mazateca Shores. They decided to return to camp after lunch, leaving us to ponder the breakdown. We were all beginning to feel the effects of back-to-back endurance trips. Steele and I were soon sleeping beneath a space blanket he had thoughtfully brought along. Johnson was still fired up and plunged on through to have a look at the L-shaped room. It must have been close to an hour later when he returned saying that he had been to the sump and thought there might be airspace beyond. It required a commitment though, a full dive. This didn't seem too promising so we returned to the breakdown maze looking for a by-pass. An hour's work netted a connection back into the upstream passage above Mazateca Shores where Steele was sacked out in the space blanket. In our state of semi-sleep we debated for almost a half hour, unable to decide if the breakdown and the L-shaped room sump were worth another 20 hour trip. We slowly retreated, leaving 3 ropes and a bolt kit for the next push assuming at least 3 people would be willing to return. At the Junction Room we found 3 wetsuit tops. A vote of confidence! We all smiled, this crew had it together. Two hours later we could smell dinner at the base of the 60 meter drop and sprinted into camp. We had been caving for 19 hours and it was 1 p.m. on the 26th. Speculation was raised as to whether Horowitz would wait until the 27th for Steele and Garza to exit or come in solo to check up on us. The question answered intself just two hours later. An echoing yell came down the 55 m pitch above camp and everyone reached for their hardhats. Grinning and ready for action, Horowitz arrived only to find everyone sitting around the

stove in a semi-catatonic state. He reported having had an interesting trip in. Since he had solod, no one was at the entrance to pull the rope out for him, so he used the Hobbit Hole. As 15 disbelieving Mazatecs watched, he tossed his cave pack down the small crawl, entered feet first, then dragged his duffel bag of camp gear in behind him! Steele and Garza then left camp for San Agustin. Steele was to return after a day on the surface and Garza would remain with Rountree as topside crew. The rest of us headed for the hammocks at 6 p.m. We awoke at 12 o'clock, refreshed - funny, only 6 hours sleep after being so tired. Horowitz said he was ready for action, so we sent him on an important mission--was it 12 noon or 12 midnight?! He had left his duffel near the entrance and had to ascend anyway. When he returned we discovered we had slept not 6, but 18 hours and it was Friday the 27th.

This was a "rest day" for Camp I. Two rough trips had taken their toll on both our bodies and equipment. Those who didn't wear gloves spent several hours repairing their lacerated hands, vowing not to make that mistake again. Most of the day was spent playing cards (Poker for M&M's) and eating. We racked out around midnight assuming Steele would wake us on Saturday morning.

BREAKTHROUGH: Steele arrived on time bringing a few extra luxuries: breads, batteries, gloves, merthiolate, and a spare wetsuit top. Rountree and Garza had hiked over to the entrance with him to guard the rope while he rapelled. We packed up for a long push trip as this might be the last chance we had at going deep. At Mazateca Shores we discussed the approach to be taken. All equipment was dropped except for standard cave packs. Following 30 m of breakdown crawl we arrived at the L-shaped room. A high lead was visible as a looming blackness some 20 m above us. Zeman and Horowitz headed for the sump and I started free-climbing the house-sized boulders. At the top, two fissure passages led off. I chimneyed down one to a 20 m drop. A waterfall was audible in the distance. When Steele arrived he somehow managed to find a bypass downclimb and got to the bottom. Johnson also found a lower route through the breakdown, joined Steele, and continued on. Stiles and I could find neither route and returned to Mazateca Shores with Horowitz to bring the survey through the breakdown, assuming the others would return soon with a going lead. By the time we reached Zeman, who was sleeping in the L-shaped room, we could hear hoots from the other two heading out. No go. The lead petered out a few hundred meters further on and the waterfall was found to be just a trickle in a side dome. One-by-one we downclimbed the breakdown toward the sump. Steele felt sure all the cave streams were entering this sump. Time for some committments. Steele and I swam to where the ceiling hit the water and looked around with an underwater flashlight. In crystal blue water we could see a passage, perhaps 1 m wide and 2 m deep, continuing under the ledge. A belay line was payed out which I tied around my wrist with a slip knot. I took a deep breath and swam 2 m or so before heading up. Airspace! I yelled back hoping someone would hear me. They did, so I continued on to check the lead. I swam close to 60 m of deep canal passage before coming to a deafening waterfall. We were back in the cascades! When I returned to the sump I found Steele coming through. He had found a 7 cm x 4 cm airspace along the ceiling where a carbide lamp could just be passed through. Both of us swam back for a conference. The canals were very cold in our tattered wetsuits. The plan was for Stiles, Johnson and I to survey through the sump to the cascade at which point we would explore for 2 hours then begin survey back. This way the second survey team of Steele, Zeman and Horowitz could traverse the canals swiftly and begin at the cascade without getting overly cold. Past the canals we traversed the sinuous canyon passage on a series of solution pendants 10 m

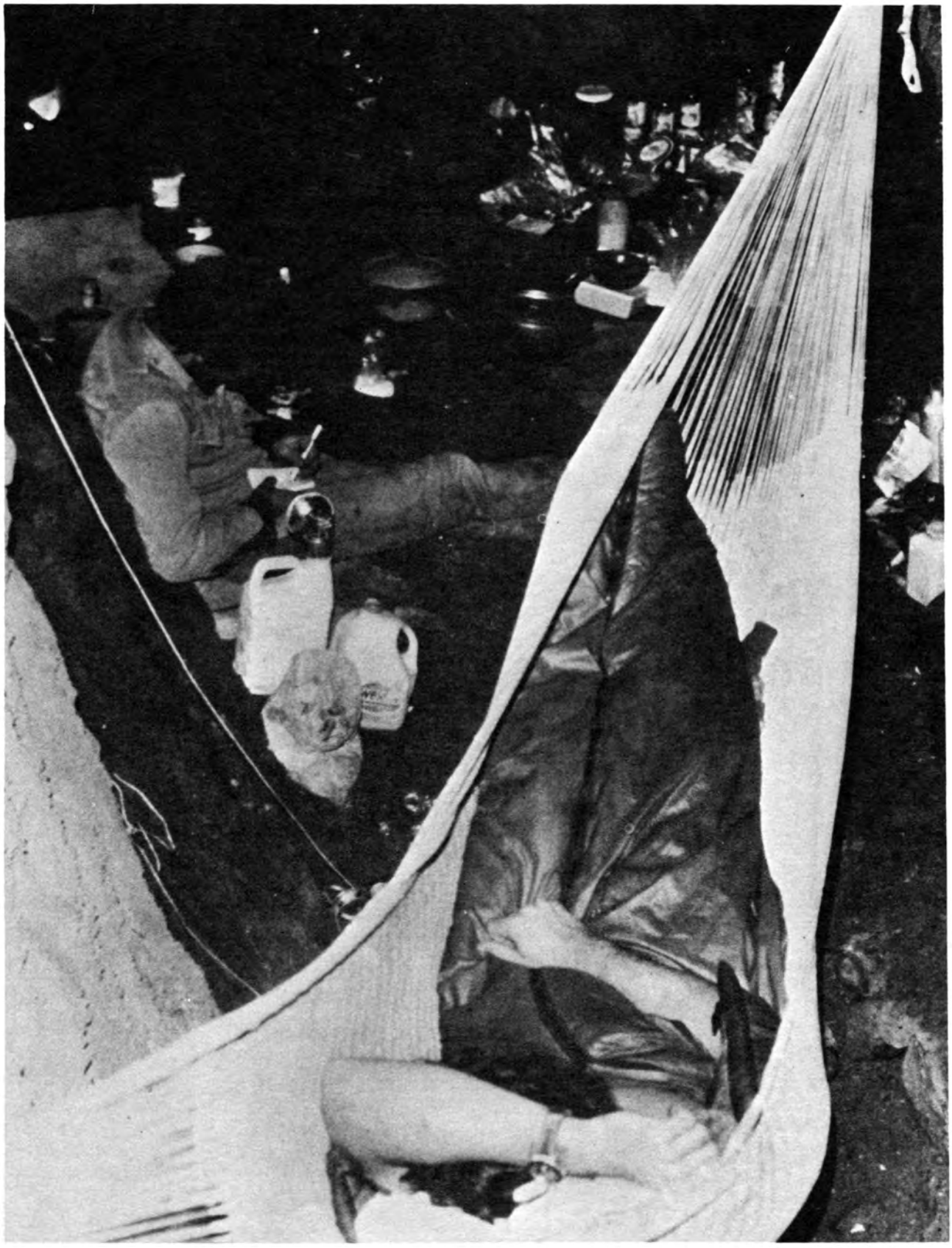
Water purification consisted of six drops of Clorox per gallon in La Grieta. (Bill Stone)

A typical Huautla underground camp pack. (Gary Stiles)

above the roaring cascades. At times the upper route would give out and we would be back in the canals swimming for 50 m or so at a time. Sections of this passage had the most remarkable solution flutting any of us had ever seen. Half meter wide blades would project from passage walls and extend vertically for 10 m or so. In other places the rock was dissolved so it formed only a skeleton of what used to be the stream floor. The thinner projections of rock in these areas sometimes were less than 5 cm in diameter, yet 1 m long! This made going extremely difficult as it was impossible to tell when a foothold was going to break off. We soon reached our two hour limit and commenced the survey. Some four hours later we connected with the other team and headed out. It was 6:45 a.m., Sunday. At 9 a.m. we reached the Junction Room. Wetsuit tops were again dropped here for the final push. Everyone was back at Camp I by noon concluding a 21 hour trip. Realizing that we could be underground as much as three more days Johnson headed for San Agustin to inform the surface crew. We were originally due to leave the cave the following morning. The camp crew then hit the hammocks for another 18 hour sleeping blitz.

Our eighth day underground was spent in camp repairing equipment. Several of us had bought new Viet Nam boots (Korean made) for the expedition and were astounded at their state of disrepair after only two weeks of caving. Three or four hours work with a sewing awl usually returned them to a functional state. Wetsuits, unfortunately, could not be repaired since they never dried out enough for the glue to hold.

BOREHOLE! Johnson arrived at 11:30 a.m. on Tuesday with news that it had been raining hard. The rainy season was due soon. Carbide and food were also getting low. This would be the last trip of the season. Along with some extra provisions he had brought in a hand calculator. A half hour's work showed the furthest survey station to be 542 m (1778 feet) below the entrance. La Grieta was now the 2nd deepest cave in the hemisphere. We suited-up for the last time and smoothly negotiated the now familiar passage. Within four hours we reached the limit of exploration. The stream canyon led on just as before: canals and cascades. This time it was Steele, Zeman and Horowitz in the lead planning a minimum four hour exploration blitz before surveying back. One rule we had been enforcing this trip (as always) was that all explored passage be surveyed. Johnson, Stiles and I began surveying in. We soon came to an apparent sump. Johnson went freeclimbing high up the wall and I went low, not sure of where the others had gone. The passage continued beneath the ledge with a 5 cm airspace. We dove this one too, arriving at the top of another 10 m cascade. For the next 1/2 km we surveyed through more canals and cascades. Gradually we left the water and began traversing large breakdown. With each survey shot the passage opened up until all we could see was a great blackness ahead beneath the 15 m high arched roof. For close to six hours we had nothing but 30 m survey shots. The roar of the river could always be heard below the breakdown. Speculation ran rampant. Was this part of some old super system? Whatever it was, it was bigger and longer than any known passage on the plateau and heading down on a steep 15° dip. San Agustin was not far away, but if we continued on this dip there was a possibility of going underneath. Our speculation was never answered for we soon heard the push team. They were just as dazed as us. Beyond the trunk passage continued even more cave of similar dimensions (20 m x 15 m), but they hadn't followed it. Several hundred meters further they had descended a rift leading into a steeply dropping chamber over 60 m wide. At the bottom they encountered another cascade and canal passage. From there they surveyed out.



Home at -300 meters in La Grieta. (Bill Stone)

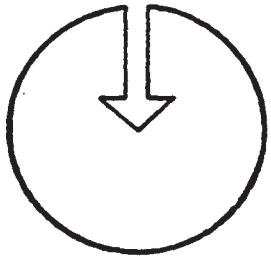
With two leads beckoning we began the retreat. The strain of a long trip began to show. Every time our procession stopped people dozed off. Only when we reached the L-room sump did we really wake up. All tackle (600 m of rope, pads, and bolt kits) was derigged back to Camp I, the last person arriving at 6 p.m. Wednesday night after a 26 hour trip.

During dinner we worked through the numbers. Total depth, verified later in Austin, was 665 m (2181 feet). Length was over 4 km. The general plan was to pack camp and degrig the entire cave on Thursday.

DERIGGING: Following a brief 12 hours in the hammocks we slowly roused ourselves to the task at hand. Personal gear was packed first. Wetsuits were not needed above Camp I so those were also packed. All cans were crushed and placed in a community garbage pile; everyone carried a share of this out. What remained of the camp food was finished off in a final gluttonous breakfast. We then scoured the campsite for trash. Not so much as a gum wrapper remained. By noon Thursday everyone had their camp packs ready for the ascent. Horowitz ascended first with just his camp pack, intending to make a second trip for rope. The rest of us machos in camp decided we could each carry a fifth of the immense pile of tackle up to the entrance in one shot. This amounted to roughly 120 m of wet, muddy rope per person in addition to a 60 pound camp pack! It all sounded so easy the night before. Johnson got 10 m into the 55 m pitch above camp before deciding that something had to be rearranged. Things were a bit unbalanced with a 100 pound cave pack! Everyone later agreed that it had been one of the most difficult ascents of their careers. Once up this pitch we shuffled half the load at a time up successive pitches and climbs. At about -150 m I met Garza on the way in from the surface to help derig. Things went smoothly from there on. Steele and I reached the bottom of the 60 m entrance shaft by dusk with six duffels of equipment. Horowitz and Johnson had gone back down to finish derigging. After freeclimbing the entrance at the top of our emergency rope we bolt rigged a pulley with a Jumar safety and began hauling equipment bags up the entrance pitch. We had been underground for 10 days and 10 hours.

EPILOG: A computer generated map of the area showed that we had stopped only 3/4 kilometer short of a major upstream lead in San Agustin. If a connection can be made between the two caves the resulting system will be 952 m deep (3121 feet) and over 13 km long. Limits of endurance, however, will necesitate a second camp at -500 m for the return expedition.

THINK DEEP



[see loose map of La Grieta at end]

Purificacion Area

Summary of Exploration

by Peter Sprouse

Two large cave systems in this mountainous region west of Cd. Victoria, Tamaulipas have been the focus of an ongoing AMCS project. The survey of Cueva del Brinco, elevation 1900 m, was initiated in August 1973 and under the direction of David McKenzie and Peter Sprouse has achieved a length of 5.2 km and a depth of 197 m. Cueva de Infiernillo, at 1100 m elevation, was discovered in April 1976, and a survey co-ordinated by Charles Fromen and Peter Sprouse has reached a length of 4.1 km and a depth of 216 m. It now appears likely that the two caves may connect; this is supported by the fact that a considerable amount of air flow enters Brinco while a large flow also exits the entrance of Infiernillo.

Following are three reports of recent survey trips. These represent all of the work to date done in Cueva de Infiernillo, while accounts of all previous work in Cueva del Brinco may be found by referring to the following publications: AMCS Activities Newsletter, nos. 5 & 6; AMCS Newsletter, vol. V, nos. 2 & 3; NSS NEWS, vol. 31, no. 11.

Discovery of Cueva de Infiernillo

by Jean Ubico

Date: April 9-18, 1976
Persons: Cathy Barnes, Mark Conover, Charles Fromen, Erin O'Hare, Jean Ubico, Harry Walker, Dorothy Walker, and Bruce Wilbur.

Under the guidance of Senor Antonio Grimaldo, a 78 year old, local sawmill official, our group located and explored several guano caves in Esperanza Canyon before heading up to Senor Grimaldo's house in the mountains. Several years ago Grimaldo and nine other men built a narrow mountain road on which to transport lumber, which we headed down in the morning to reach the embarkation point for an exploratory hike. The inexhaustible 78 year old Senor macheted down vines and limbs to clear the semblance of a trail for us through the thick jungle vegetation. Huge boulders blanketed with slippery moss form an obstacle course along the river bed that winds through the canyon. And then we came upon it: an enormous, black cave mouth some 35 meters straight up the face of the cliff. During the rainy season a giant waterfall cascades out of the entrance down to the river below. The Senor had once shown the cave site to some American tourists who merely took pictures; our crew began immediate plans for entry.

The next day the most experienced caver-mountaineers of the group, Charles

Chaining a passage in Cueva de Infiernillo. (Tom Byrd)

and Harry, were elected to scale the steep cliff face. The rest of us manned strategic points on the boulders to photograph the ascent into the cave mouth. The climbers tied a rope around a tree adjacent to the top of the cave and rappelled down at an angle to the entrance. A second climb was necessary to free the entangled rope from the trees. A line was then dropped from the mouth to the cavers at the base of the cliff, and thus began the seven hour ascent of the novices supervised by Mark. A dense, tropical rain further slowed the upward trip. The main entrance of the cave measures 20 m in width with a ceiling of 25 m. Piles of boulders intersect smooth sand banks along the gradual descent of the central passage. Clear puddles of water in which tiny pieces of wood have been deposited dot the sandy areas. The wood indicates the possible existence of an upper cave entrance from which debris would be carried by the water through 1000 m or more of rock. Our exploration of the main passage was halted initially by a 6 m deep lake with a siphon and then by a 23 m shaft with water in it. The side passages, however, proved to be rambling and of varied feature. One in the vicinity opens into a compact room filled with thick, pudding like mud.

Dinner that evening consisted mainly of breakfast bars, as our rations at that point were rather limited. With a great amount of rustling, we huddled together for siesta under the crinkly, flourescent space blankets. Unfortunately our body heat was absorbed in a short time by the cold sand banks. At about 4 AM the cave exploration resumed. A pit in the rear of a dome shaped room with five entrances descends some 12 m and then opens

into another major passage. The pit was not entered due to lack of proper equipment; we did, however, investigate the path out of each of the five entrances. A strong wind blows down these passages, a further indication of a possible upper cave entrance. A series of fifteen foot travertine dams line one lengthy passage; 60 cm stalagmites in the shape of bushes cover the floor of another.

In the morning four cavers rappelled down the cliff, while Cathy, Charles and Mark completed the partial mapping of the side passages. A total of 1158 m of cave was mapped in 50 different stations. The extent of the area that remains to be explored may be virtually infinite. The backpacks weighed heavily on the two hour return through the jungle to the van. A symbolic walking stick and rock etched with Grimaldo's initials awaited us on the windshield of the blazer. Concerned about our welfare, the old man was on his way down to the cave.

After stopping in the mercado in Cd. Victoria, we returned to Texas via Reynosa.

Cueva de Infiernillo and Cueva del Brinco

by Peter Sprouse

Phase I: May 6-13, 1977
Persons: Ralph Batsche, Mike Connolly, Charles Fromen, Carmina Fromen, Peter Sprouse, Terri Treacy, and Harry Walker.

Terri Treacy and I spent two weeks caving in the Cueva del Brinco vicinity with two groups of cavers. On Friday, May 6, we left Austin for Houston where we joined with Greater Houston Grotto cavers, Ralph Batsche, Mike Connolly, Charles Fromen, Carmina Fromen and Harry Walker and headed south to the land of caves. We crossed through Reynosa the next day and on to Cd. Victoria, Tamaulipas. Driving part way up the mountain we camped near Paso de la Muerte that night.

The following morning, May 8, we drove on to Sr. Grimaldo's house at La Curva. Here we packed for the hike down to the large cave being explored by the Houston cavers, which Grimaldo informed us is called Cueva de Infiernillo. We planned to stay in two days, all setting off with heavy packs except for Carmina, who stayed at Sr. Grimaldo's house. We were able to drive within a kilometer via a new logging road yet the rough hike still took 1-1/2 hours. After dropping down into the canyon we found ourselves following up a 15 meter wide arroyo with truck sized smooth boulders. Soon this arroyo ended abruptly in a sheer cliff face 40 m up in which was the huge entrance to Cueva de Infiernillo (the Cave of Hell). During times of flood, a powerful waterfall must fall from the entrance, evidenced by the usually dry 3 m deep plunge pool and ensuing arroyo. The only access to the entrance is by an interesting climbing maneuver; Harry and I did a steep bushwhack up the left side of the arroyo until we met the sheer cliff face. Here we were 25 m above the lip of the entrance and could rappel down to a ledge leading into

the cave. We pulled our rope down behind us and rigged it down the 40 m drop to the arroyo for the others to ascend. My first impression of the cave was of the strong wind blowing out of the entrance. I had never seen anything like it in my life. The entrance measures 20 m X 25 m, yet still a piece of flagging tape, .5 meters long, would flutter 70 degrees off of horizontal! Hmm! Promising cave.

Once we were all in we hiked on down the trunk passage towards our campsite. We were to camp down the right hand passage about 300 m in past where the main passage forked. Halfway there we noted a right hand side passage not shown on the survey. Terri and I explored down this major inlet for about 150 m (50 m vertically) to a large, deep sump. It appeared to flood upwards to contribute to the entrance flow. Continuing on down the main passage we came to the fork - or so we thought. A steeply climbing passage took off to the left blowing air. But just a little further on was the major fork in the passage, so we went on down to camp. After setting up camp we all went down to the end of the right hand passage where Terri and I suited up to investigate a large lake. This is a definite sump with a dipping ceiling and about 7 m deep. This sump also apparently floods upwards. We collected some rare Asellid isopods here. Afterwards Terri and I returned to the main passage to investigate the left hand lead which the other had also missed in their previous survey. We explored quite a ways with air blowing in our face, climbing up a continual 30^{o} dip. We ran back down to camp for the night.

The next day the others decided to push our ascending passage of the night before. Terri and I elected to pursue the main passage to see what it did. We explored several new side passages of fair promise before reaching the end of their survey. The passage was climbing steeply up to that point, over ancient rimstone and deep dry plunge pools. Obviously the river that once flowed here now travelled a deeper, unknown route, with only a strong wind beckoning us on. We reached a seemingly unclimbable flowstone falls just as the voices of the others floated to us from above. Their passage had reconnected into our 400 m linear distance from where it had taken off! Up on a high balcony opposite the flowstone they had connected in after partially exploring a series of high ascending tubes that appeared to be the source of most of the air in our passage as well as theirs. They began to survey back to the main passage. With a boost from Terri I managed to find a route up the climb and explored on ahead. The passage split into at least six ways - I explored a while before giving up. Returning to where Terri was we explored into a lead there which split into three passages which also continue. We then went back to camp for the night.

We packed up the next day (May 10) and exited the cave. The others' survey had brought the length of Infiernillo up to 1.8 km; the depth must be somewhere around 130 m so far. Altogether a most promising cave surely to be one of Mexico's longest and perhaps deepest - determined exploration should bring rich discoveries. It is on the same frature zone and some 4 km away and 800 m lower than Cueva del Brinco - so it may connect, though this would require a serious effort. It appears to be primalrily a fossil resurgence however, so the main Brinco drainage may still go on down to the Zona de Manatiales 600 m lower than Infiernillo.

We continued on up the mountain for further caving, returning to the Brinco

area on the 12th. The Houston cavers departed for Texas leaving Terri and me at the Brinco camp to wait for Ediger's crew to arrive for the Brinco push. (See AMCS Activities Letters #4 & 5 for previous exploration accounts.)

Phase II: May 13-22, 1977
Persons: Sheila Balsdon, Gill Ediger, Preston Forsythe, Margaret Hart, Shari Larason, Thomas Moore, Diane Perwien, Peter Sprouse, and Terri Treacy.

While waiting for the rest of our crew, Terri and I occupied ourselves with unfinished leads in Brinco in the area of the cave near the entrance. The first day, Friday the 13th, we entered the second left hand passage and mapped into the downstream lead to where a second stream passage came in. We surveyed up the incoming stream to a low stream bellycrawl. We netted 183 m of survey in a 6 hour trip. The next day we were preparing to enter the cave to continue the survey when we heard the unmistakeble sound of Ediger's truck grinding up the mountain. Soon it arrived carrying Sheila Balsdon, Gill Ediger, Preston Forsythe, Margaret Hart, Shari Larason, Thomas Moore, and Diane Perwien. After much hoo-haaing Terri and I continued on into the cave and surveyed downstream from the previous night's stream junction. Our surveying tied in to the bottom of familiar Traverse Pit, creating a link long missing, as well as part of another link to the first stream. Another 6 hour trip with 171 m mapped.

On May 15 the others were rested from their journey and ready to cave. Ediger led Margaret (her first Mexican cave) and Diane (her first cave anywhere!) to the Loser's Paradise area and did some lead checking. Terri, Thomas, Sheila, and I returned to the Canal, the caves deepest point at -180 m, and brought the survey up to the limit of exploration of the previous trip. From there the trunk of the World Beyond led on into the unknown. We netted 532 m in a 17 hour trip.

The 16th of May was an R&R day. On the 17th Ediger, Margaret and I walked up to look at an interesting entrance above town that Ediger had been shown by a local. It takes some air. Quite close by we found a slightly higher entrance that blew air and a stream could be heard inside. In the afternoon two teams returned to the World Beyond while Diane and Shari dug in a lead near the entrance. On the trip into the cave Ediger made a physical connection upstream from Laguna Verde to the limit of exploration below Katy Falls. In the World Beyond Ediger, Margaret and Sheila surveyed upstream for 200 m before the cold lakes convinced them to quit. The passage continues upstream with air movement going downstream. Preston, Terri and I charged into the downstream "River Beyond" with nearly continuous 30 m shots. After about 250 m of wide stream trunk the passage enlarged into a huge room 30 m X 50 m X 20 m containing an immense flowstone mountain - dubbed the "Throne of Oztotl." Beyond the stream continued as ever, through long deep lakes and under breakdown collapses. With the setting of our last station we had mapped 937 m that day and

increased the cave's depth to -197 m. I explored on ahead another 100 m and saw no end in sight - indeed, the water flow seemed to be increased and the passage ahead took quite a bit of air. We exited after 17 hours.

The 18th we rested, and on the 19th Thomas, Sheila, and Margaret went into Brinco to Laguna Verde where they attempted to survey the connection Ediger had made. They mapped partway up to the end of the other survey. Ediger, Diane and I did a surface survey from Brinco through town up to the two new high cave entrances. We mapped 60 m upstream into Entrada del Viento Alta to the bottom of a 10 m dome. Here a fault was visible, the chert beds having about 10 cm displacement. The dome is climbable, but requires a belay. Into Entrada del Viento Baja we surveyed 40 m to a pinch. I squeezed on through and explored another 60 m downstream in tight passage. It will probably connect into the Brinco system but will require a lot of work - a connection would add considerable depth.

By a long shot this was the most successful trip into Brinco to date. The cave's length was increased from 3.2 km to 5.2 km in the cave's largest and longest passage. The configuration of the cave was totally changed and a definite trend established. The cave has been extended 1 km to the south, away from the assumed resurgence to the north. It seems to be trapped in a minor syncline that has captured stream flow along its axis. At some point (which could be a long way off!) it may break through this, dropping down and doubling back. Such an occurance would also break the recent horizontal trend and again result in increasing depth. The cave thus far has dropped 197 m of a projected 1400 m potential. The new discovery is so vastly different it almost doesn't seem like the same cave. The well integrated dipping stream maze has intersected a large horizontal stream trunk 1.5 km long (so far). By all indications this passage will continue a long way in both directions.

Further Exploration in Cueva de Infiernillo

by Maureen Cavanaugh

Date: July 29-August 6, 1977
Persons: Terry Sayther, Tom Byrd, Sheila Balsdon, Maureen Cavanaugh, Jeff Horowitz, and Peter Sprouse

July 29: After much soul searching about "Mexico or Convention" our crew headed resolutely south. The 2 a.m. border crossing at Matamoros presented no problems and we arrived in the Victoria square in time for sunrise and breakfast. After an assault on the mercado it was time for a swim and watermelon gobble in the El Carmen canal. A ruthless bout of seed spitting ensued, but the mountains beckoned to us . . . A wet and muddy road was anticipated due to the rainy season but it was very dry. That evening we camped at the Paso de la Muerte campground and watched the rising of a billiant full moon flooding the valley below with an eerie silvery light. The weather was warm but pleasant and we all felt exhilarated to be out of the sultry lowlands and into the dry mountain air.

July 30: The next morning we paused for a few minutes about a kilometer from Purificacion for a first glimpse of our quest, the Cueva de Infiernillo entrance which is situated in a cliff face 35 m above the head of the Canon de Infiernillo. Looking west across the valley from this point (towards Sotano de los Novios), Terry spotted a road that comes down from Dulces Nombres to a settlement called La Joya and a mine. Possible cave entrances were noted on that side of the valley. Next we stopped in the far end of the village of Ejido Purificacion (La Curva) for a few minutes to chat with that very fine old gentleman, Senor Antonio Grimaldo and to inspect the (now) famous airplane door pigpen. Senor Grimaldo remarked that it hadn't rained in about three weeks; mentioning that a waterfall comes out of the entrance of Infiernillo during times of heavy rain. After a few refrescos we drove down to the end of the logging road and began our 2-1/2 hour descent into the arroyo with 20-30 kilo backpacks. There is no trail and the hillside consists of loose karst blocks covered with dead oak leaves. Fiendish thorny vines caught on clothes and backpacks and caused occasional cases of tanglefoot. Returnees beware: THAT SILENT MENANCE, POISON IVY, IS EVERYWHERE! General consensus was that a priority on the next trip would be to establish and mark a good route down the hillside. The arroyo was a welcome change and we were surprised by a small cold spring gurgling out of some talus which provided enough water to sit down in. The entrance was close by and in another 15 minutes we were at the bottom of the cliff admiring the 20 X 25 m entrance 35 m up and contemplating the cold 2 m deep spring fed plunge pool at its base.

Jeff, Peter and I did the climb to above the entrance and Peter rigged his 45 m Goldline which barely reached a ledge by the entrance. The view was fantastic and cool brisk breeze blew out the entrance. After packs were hauled up Terry, Sheila and Tom prusiked up and we backpacked through impressively large trunk passage (over slippery breakdown) to our predetermined basecamp 500 m inside the cave. This was the beginning of five days underground.

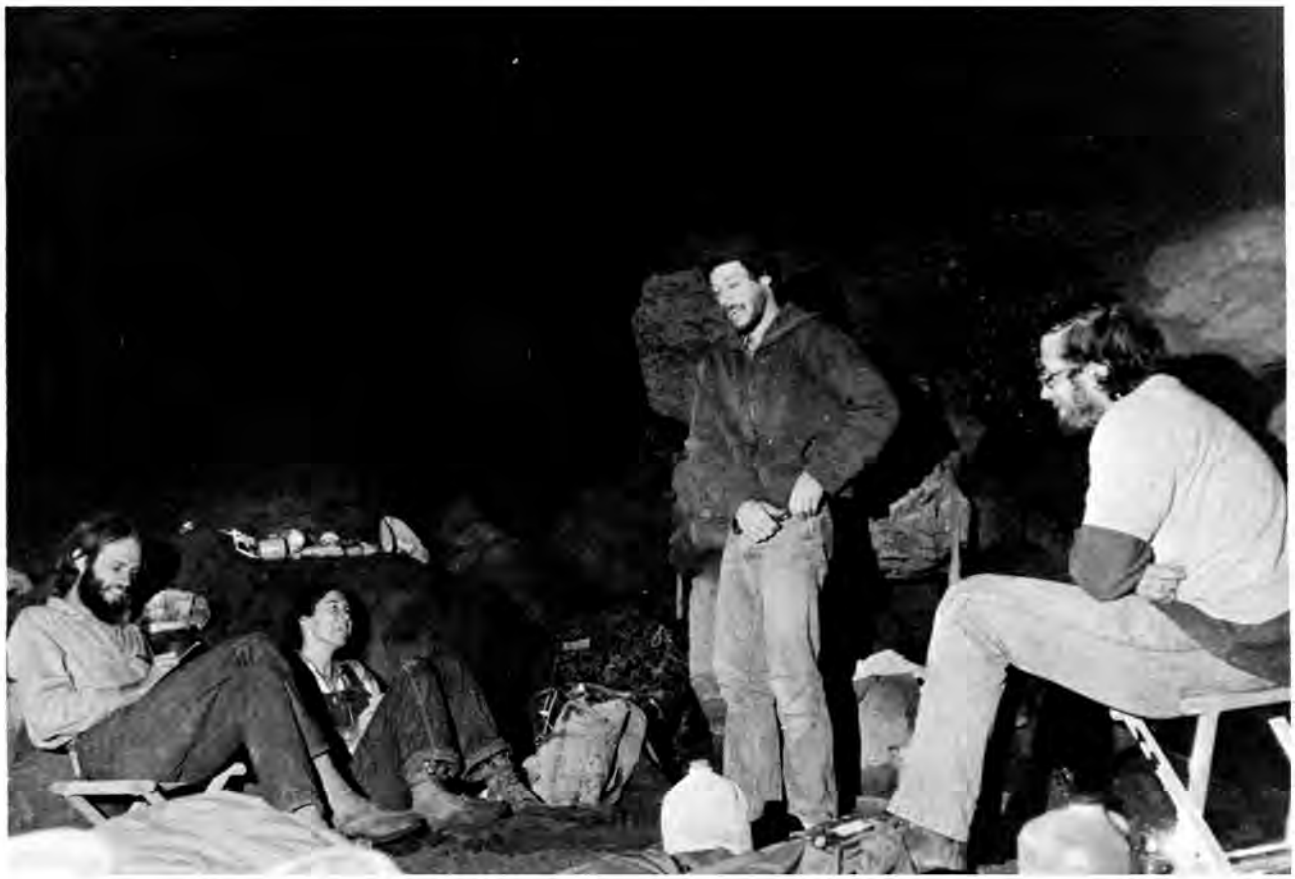
August 1: Two survey teams were formed to start on the day's work. Peter, Jeff and Sheila began to survey up the left fork of the main passage while the other team of Tom, Terry and myself mapped up the middle fork. The middle fork was your basic booming trunk passage with passage width up to 20 m and ceiling heights ranging up to 25 or 30 m in some places, and abounding with promising side leads. The middle fork initially trended downwards to the level of the entrance and then gradually up for the remainder of the survey. The last 150 m we surveyed up tiers and cascades of dry flowstone and rimstone dams that contrasted nicely with the dark grey scoured walls. A brisk breeze was blowing towards the entrance and was especially strong in one place where the ceiling height dipped to 3 m. The terminus of our 8 hour, 666 m survey brought us into voice contact with the other crew and Terry climbed up another flowstone slope to establish visual contact. They shot down 35 m from a balcony to a station Terry established. They had mapped 714 m in their survey, which was a rehash of a Greater Houston Grotto survey, necessary to get a running vertical profile and add passage details to pinpoint locations of numerous side leads. Total surveyed length in the cave was 1988 m.

August 2: Day 2 underground again saw two teams in action. Tom and I returned to the middle fork to photograph and to complete the final 146 m of the main passage loop left from the previous day's survey. Sheila, Jeff and Peter mapped in the Confusion Tubes, which proved to be fairly complex. The Tubes are a

series of parallel ascending (+30°) vadose tubes 1-2 m in diameter with pits leading off at an angle of -70°. Past the Tubes was a T-junction. Following the air led them to another large junction room with three passages leading off from a lake (Lakeland). One lead took air and headed back. The other blew air but led to untraversible Frustration Lake and the third led to another lake with a good wind that could be traversed on one side. It led into a large breakdown trunk, past the Bucket (a retable done by holding onto the edge of a rimstone dam) and under some natural bridges or "Puentes de Oztotl." The survey was terminated and Jeff explored on to a large room with a climbdown. Then they retreated back to the Confusion Tubes and tied up another loop. They had mapped 636 m in their 11 hour trip. The cave now had 2780 m of mapped passage.

August 3: Sheila, Peter and I mapped north off the other large junction room that was before the Tubes, while Terry photographed the surveyors in action and checked leads. Tom and Jeff returned to the Tubes for a photographic trip and joined us later on. We mapped past GHG stations and started into virgin passage. Average passage size was about 3 X 2 m. The survey was stopped by an unclimbable 8 m pit taking air. Three hundred and fifteen meters were surveyed on this trip, bring the cave length up to 3095 m.

After returning to camp Peter and Sheila decided to take a look at the Sand



Campsite activity in Cueva de Infiernillo. (Tom Byrd)

[foldout map of Purificación area followed this page]

Room which was down passage from basecamp. It had flooded since the previous trip 11 weeks before and the entrance to it sumped. They looked at the left hand sump and decided that it was up 6-7 m. On the way back to camp Peter noticed that the air flow was going up and was surprised to notice a large dome in the ceiling. Two passages appeared to be going off of it about 25 m up. It is unclimbable but perhaps someday the top will be found. When he returned to camp Peter measured the cave temperature of 59°F.

August 4: Jeff, Peter and I went back to the end of the furthest survey while Tom, Sheila and Terry mapped to the right at the T-junction and into the Tubes. Peter, Jeff and I mapped through big trunk passage trending 160° with a good wind coming out of it. Eventually the passage lowered to a crawl but by following the air through a breakdown maze Peter found a parallel trunk passage that continued. Our survey stopped at the end of the crawl and on the way back to camp we tied up another loop in the Tubes. Meanwhile Tom, Terry and Sheila gave up in disgust at a pit after mapping 50 m in 30 stations in the Tubes and returned back to camp. This combined with the 864 m of our survey brought the cave length to 4 km.

August 5: Jeff was developing a bad case of poison ivy and mildew was beginning to set in. It was time to think about heading out after five days underground. Grimy cavers' hearts were gladdened by the thought that soon they would be out romping in the sunshine, washing off the sweat and mold of five days in the sparkling cold waters just beneath the entrance. Yahoo! Tom and I returned to the middle fork for some last minute photographs and to finish details on the vertical profile. When we returned to camp everyone else was gone and after a quick packup we headed for the exit. After days of semi-darkness the first sight of brilliant blue sky and green trees seemed an incredibly lush and welcome sight. I yearned for the rejuvenating catalyst of sunshine and water, nature's best alchemy. As I reached the entrance I was surprised to find the others standing and sitting listlessly about. Why weren't they already frolicking in the water below? I set my pack down and walked to the edge and looked down, and looked . . . and looked again. NO WATER, not one drop. I realized immediately that it must be a result of God's perverted sense of humor; Oztotl would never play such a mean joke.

Peter rappelled down first with his backpack on. The first part of the descent, against a wall, went smoothly but when he reached the free part of the drop his backpack pulled him over backwards and in extricating himself he scraped his arm badly. The rest of us suspended our packs from our racks with a carabiner and a short length of rope and rappelled down to the ledge with no problems. Jeff and I came down last and lowered packs to the base of the cliff. Peter decided to leave his rope rigged permanently to avoid having to repeat the entrance climb on return trips.

The hike up the mountain took an hour and a half and soon we were back at La Curva eating delicious goat's milk cheese and tortillas courtesy of Senor y Senora Grimaldo. That night we camped at the Paso de la Muerte campground and drove down the next day (August 6) for another swim in the El Carmen canal. After comida at the Restaurante San Carlos we cruised north at top speed. The Customs official at the new bridge took one look into the truck and shuddered in disgust, and soon we were back in Austin with good stories to tell, having proved that you can go caving in Mexico in the summer time.

Credits: Many thanks to Peter Sprouse for the use of survey and trip notes.

La Sistema Purificación: a theory and a goal

by Peter Sprouse

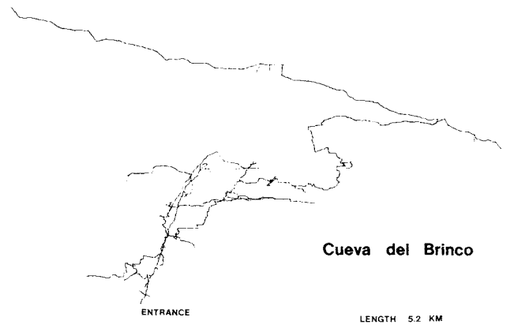
As these trip reports and accompanying line plots imply, the cave potential is immense. At this point, if Brinco and Infiernillo were connected the combined system would be around 800 meters deep. The passage length required for a connection between the two, now 5.2 km and 4.1 km respectively, could be anywhere from two kilometers to ten. The downstream and downwind passage in Brinco is currently heading nearly due south and doesn't appear to be likely to change trend any time soon. Geomorphic evidence suggests it could maintain this trend for up to 15 km to the south. Additionally, the major likely resurgences located 10 and 20 km to the north of Infiernillo amount to a potential linear extent of 20 - 40 km. In comparison, the current linear extent of the world's longest cave, The Flint Mammoth Cave System of Kentucky (length 297 km) is around 10 km. The potential for density of passage development in the Purificacion system is probably similar to Flint Mammoth. Yet the potential for vertical development is some 20 times greater. From the springs of the Rio Purificacion to the high karst of Rancho Nuevo is a vertical gain of over 2000 meters. It is interesting to note that thus far there has been no vertical work involved, with the notable exception of the ropework required to get up into the cliffside entrance to Infiernillo.

So we are indeed embarking on a project of immense potential that could produce the world's deepest and longest cave, although its realization admittedly may take many decades. All survey data is now computerized and stored on permanent file at the University of Texas and line plots similar to the ones used here will be used to show the continuing development of the system. Meanwhile a serious program of study and survey will continue in the field the likes of which has not been seen in Mexican speleology.

PURIFICACION AREA

TAMAULIPAS, MEXICO

LINE PLOTS COMPILED BY PETER SPROUSE AND DAVID McKENZIE BASED ON SURVEYS BY THE ASSOCIATION FOR MEXICAN CAVE STUDIES 1973-1977. TOPOGRAPHY AND ENTRANCE LOCATIONS FROM 1:50,000 TOPO MAPS.

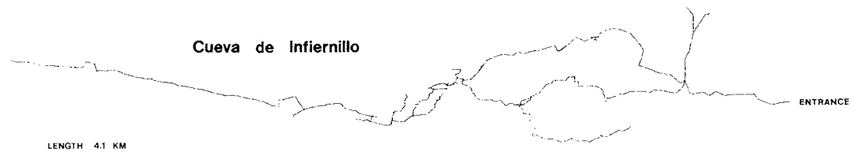


Cueva del Brinco

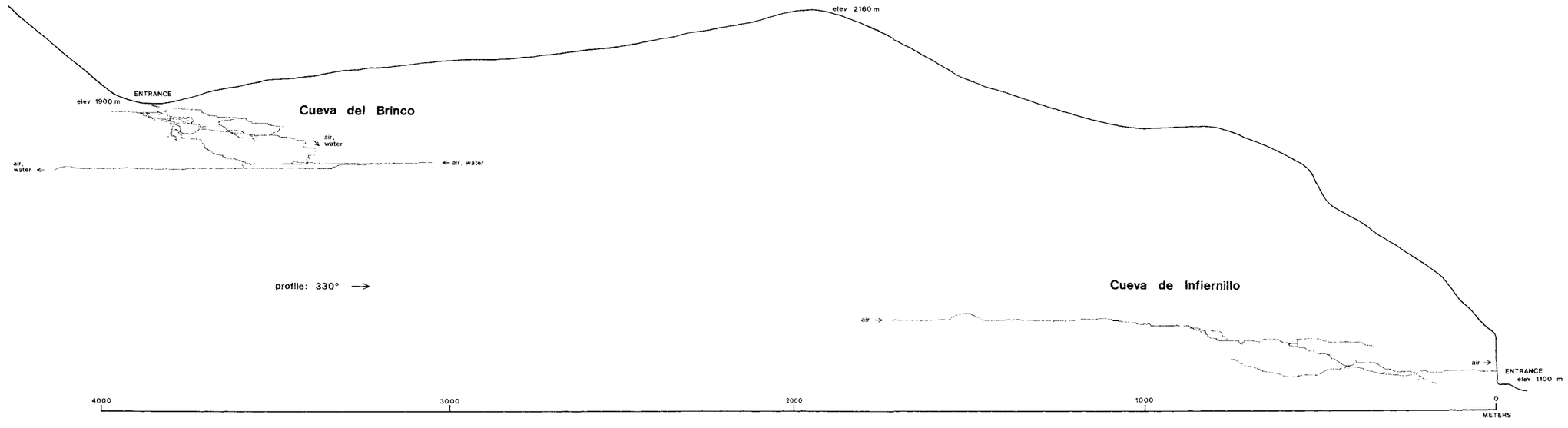
LENGTH 5.2 KM

plan

Cueva de Infiernillo



LENGTH 4.1 KM



Between the Cold and the Glory

by Terry Sayther

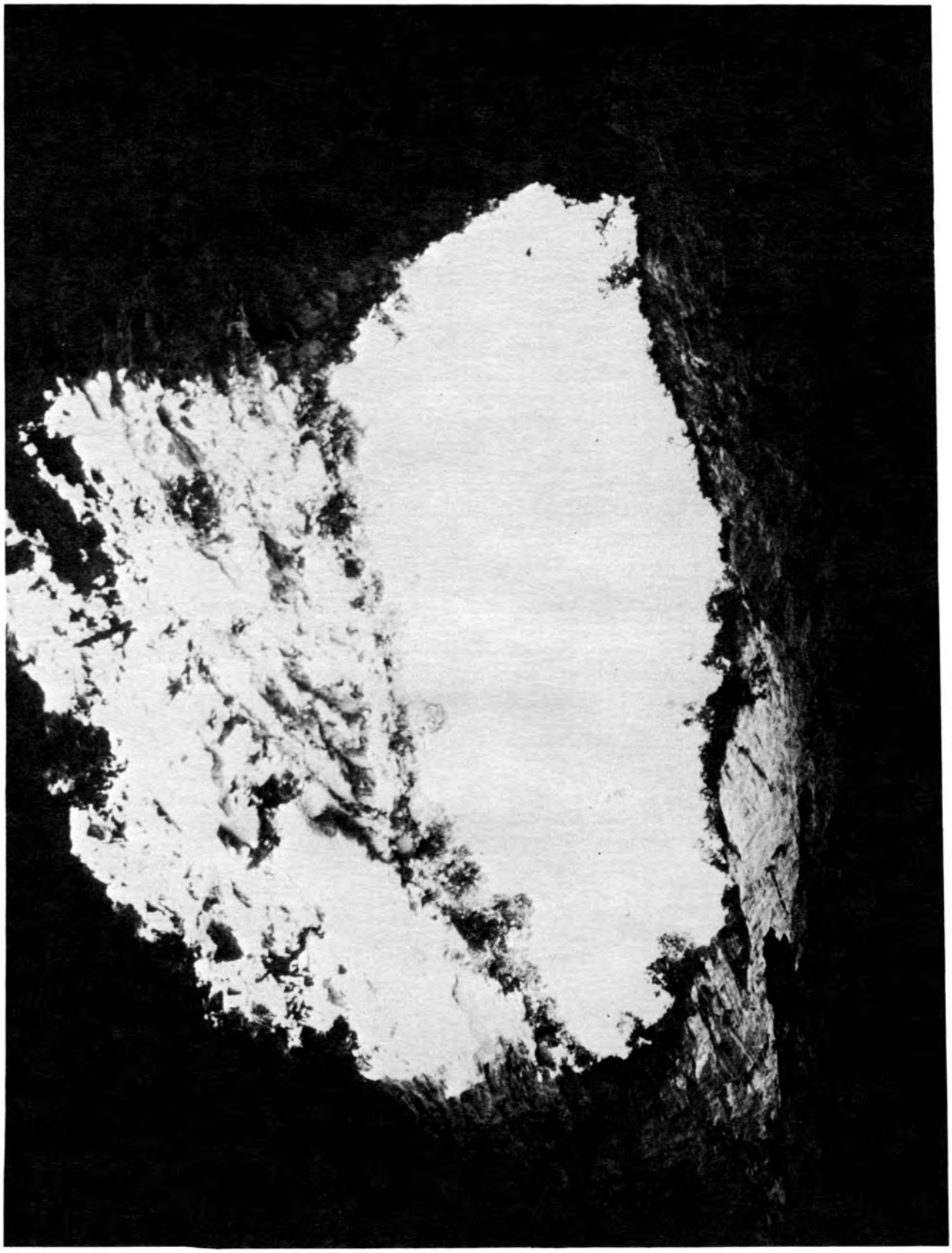
Probably a high percentage of you out there consider Northern Mexico a region of desolation and boredom which is crossed on the way south to the GOOD STUFF. Another high percentage of the Activities Newsletter readership has probably never considered it at all, having travelled through it at night or while asleep. The caves of Northern Mexico have traditionally been used for recreational weekend caving. Mostly these trips revisit a small number of well-known caves including Gruta del Palmito near Bustamante, N.L., famous for its spectacularly big rooms and well decorated walls; Gruta de Carrizal near Candela, N.L., smaller but also highly attractive (especially for those tending toward webbed toes); and Gruta del Precipicio. Although visitation has not become frequent yet, Elusive Pit should probably be added to this list since its entrance drop (about 140 m) is a strong attractant to many. Visitation of these caves is a custom handed down from one caving generation to the next, and as such is not news. Once activities of this sort are weeded out, it becomes easy to report on those remaining. Because only a few people do exploration in Northern Mexico, there is little left to report.

Probably the most interesting of recent events is the visitation of a vertical cave near Candela by South Texas cavers including Craig Bittinger, Paul Duncan, Fred Paschal and others. As yet unnamed and unmapped (at last word), preliminary measurements indicate a depth of over 120 m. Another vertical cave, Cueva del Milagro, south of Monclova, Coah., was investigated by Austin cavers, Preston Forsythe, Shari Larason, Thomas Moore, Bill Morrow, Ron Ralph and Terry Sayther. It was explored briefly down to a depth of about 35 m where two drops of 30^{+} m were encountered.

Additionally, several medium sized caves in the Sierra la Ventana ridge extending to both the north and south from Elusive pit have been visited and mapped (Blake Harrison, Ernst Kastning, Bill Morrow, Al Ogden, Sandy Flint Ogden, Ron Ralph, Terry Sayther, and many others). A number of these caves are associated with archeological material such as pictographs on nearby shelter walls. Many of these same cavers have become involved with documentation of these and other pictograph and petroglyph sites in the area.

In spite of the proximity of Nueva Leon and Coahuila caving areas, little else has been done recently, and much of the area remains virtually untouched. In all directions from the Monterrey-Bustamante center, and especially to the south and west, there is tremendous potential for AMCS-type speleological imperialism.

If you have been involved with, or are aware of other work (or workers) in any part of Northern Mexico, please notify either me or the editors of this Newsletter so that such material can be included in future issues. Additionally, information on Indian Rock Art sites throughout central and northern Mexico would be appreciated.



Rappelling the high side drop of Hoya de las Guaguas. (Bill Stone)

Back to the Bird Pits

by Bill Stone

Summertime in Austin is frustrating. To a caver that is. Montana is nice, but far away. So is Huautla, but the rains have come. With only a three day weekend to spare neither of these seemed feasible. Frank Binney once told me of a two day trip to Sotano de Soyate, but it took four days to recover. With plans for the upcoming Xilitla Bulletin in the works Hoya de las Guaguas seemed the logical target for a weekend endeavor, as this was the only remaining major cave in the area lacking a map. Caver opinion was clearly divided to the moment of departure from Kirkwood Central on Friday, July 1. The rational point of view (it's at least 16 hours driving to Valles plus a 3 hour backpack) gradually lost out to the fanatical faction (we can map the whole cave, dive the sump and still have time to hit the Rio Huichihuayon!)

Guaguas is a spectacular hole. The few who have been there rate it second only to Golondrinas. The cave consists basically of two immense interconnected domepits, each over 200 m high and 200 m in diameter. The shortest way in is a 147 m drop from the low side of the pit, and the controversial high side drop was reputedly -229 m. In order to accurately plumb both drops a 410 m spool of thin guage wire was procured. Following the usual last minute personnel shuffling Peter Sprouse, Gill Ediger, Bill Steele, Andy Grubbs, Katy Knighton, Audry Larken and I piled into my truck and were off to Guaguas.

Despite the shortness of time we stopped at Aquismon long enough to greet Sr. Ramirez, the new presidente, and obtain a letter of permission. Much to our delight we were informed that the road to Tampaxal was finally being built. From El Limon the road traversed the valley and climbed almost to the western crest before becoming impassable. Even so it cut well over 2 hours off the hiking time from La Pimienta.

A forty minute hike Sunday morning brought us to the gaping precipice. We rigged on the high side with a 430 m line (overkill?).

Steele, Grubbs, Ediger and I formed the two bottom survey teams and rappelled in. Sprouse, Knighton and Larken began the surface survey by unreeling the wire spool at the high side datum. Once measured they began the long process of rolling it back up onto a stick. Meanwhile, the bottom teams surveyed two loops around the entrance chamber closing on the touch down point. The low side drop was also wired despite a heavy downpour topside. Following lunch we surveyed down the long chute to the lower chamber. Ediger and I then took

the right wall while Steele and Grubbs went left. The immensity of this chamber is rivaled by few caves. The high vaulted ceiling looms 200 m overhead. Light from the entrance is still visible as deep as -430 m! Steele and Grubbs shrunk to specks as they traversed the far wall 200 m away. Thirty meter survey shots hardly made perceptible progress. Ediger and I surveyed for three hours in an apparent straight line. Once the loops were tied, Ediger sketched in the detail for the "hole" of our doughnut survey and headed out. The rest of us surveyed through a near guano sump and down the phreatic tube Steve Zeman and I had found several years before. The passage was somewhat drier and the sump at the end had receded close to 10 m vertically. With the survey complete Steele and I dug out our diving masks while Grubbs fished for an evasive, blind crayfish. No one had any luck. Grubbs missed the critter, but was highly successful in murking up the sump. Steele kicked around, deciding not to free dive. Following some indecision I cracked a lightstick, turned on my nicad and dove it for 6 m or so with Steele belaying. The ceiling continued down on the same dip with no signs of a change so I turned around and gave a yank on the belay line. Steele then pulled me to the surface. Surveyed depth to that point was 465+ m (1540 feet). Only a dry season push with diving tanks will tell if Guaguas is really finished. We returned to the entrance chamber well after dark and began the long prusik. Sprouse and Ediger provided some diversion with a spectacular 200 m glowing cyalume "waterfall." In return Steele ignited several strips of magnesium. We drove home the following morning after a dip in the Rio Pimienta. The high side drop was later measured in Austin at 202 m with the low side 147 m.

POEM IN HONOR OF RETURNING HEROS

Down through the cornfields
On precarious slopes
Heads filled with vapors
Hoping high hopes,
Past cana crazed Mazatecs
Thirsty for ropes,
March the disciples of Oztotl.

Bent with the weight
Of overstuffed packs
Buried in Bluewater
Rattling their racks;
One more grain of granola
Would have broken some backs
Of these brawny children of Oztotl.

Bent on descent
Of impenetrable gloom
Forsaking bright hillside
For dank dripping room,
Living for days
Without use of a broom -
Brave brethren of Oztotl.

For over a week
To chimney and crawl,
Gliding down drop
Clawing up wall
Plunging the sump
They follow the call
Of the Great God Oztotl.

Now battered and bruised
They ascend from the depths
Their dope stash is empty
Their muscles crave rest,
But Salvation is certain
For they answered the test
Of Omnipresent Omniscient
Omnipotent Omniverous
Oztotl.

Cathy Rountree

Getting Down in Peña

by Bill Stone

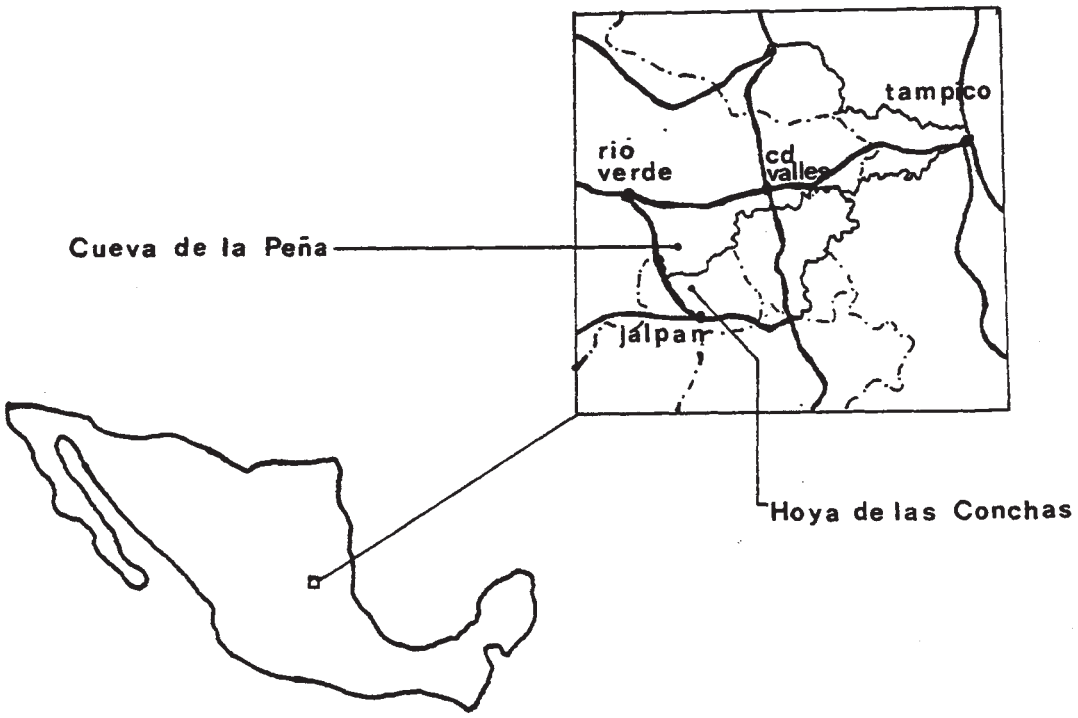
It had almost been a year since the discovery of Cueva de la Pena when our group arrived at Rancho la Presa, S.L.P. Preston Forsythe and I had located the entrance on a long hike from Tierras Prietas during November of 1976 and had unsuccessfully been trying to return since then. This time the trip came off, even though we could only afford a four day blitz from Austin. Along with Preston and I were Shari Larason, Margaret Hart and Jeff Horowitz.

At Rancho la Presa we were greeted with enthusiasm as close to 30 townspeople followed us up the mountain. The hike to the entrance was short but strenuous in the hot September sun. Ripe Guayabas along the trail proved to be palatable thirst quenchers.

We soon crested the doline edge. Cueva de la Pena lay beneath a striking 30 m high headwall of limestone 1/2 km away. A 6 m wide arroyo wound sinuously across the fields of Heloti before abruptly diving into the wide gash which forms the entrance. Here we unloaded our backpacks and sorted equipment. In addition to standard equipment we had brought close to 400 m of rope in high anticipation of a deep system. Shari, having forgotten her helmet remained topside, leaving the rest of us to the task at hand. The entrance series was composed of several 6-8 m handline pitches followed by a stream passage. Strewn about this area were disgusting piles of vampire guano. Following a 6 m pitch we arrived at the limit of exploration; a 13 m drop. From this point on we could easily have been in any of the San Juan Plateau caves. The generously sized passage continued only a few meters past the 13 m drop before intersecting with an even deeper shaft, 25 m. The rock throughout this portion of the cave was extremely fractured and natural tieoffs proved scarce. Sometimes this necessitated wasting up to 15 m of rope just to achieve a safe rig. We greatly regretted having left the bolt kit in the truck. Beyond the 25 m pitch (which had a knot halfway down) came four more "nuisance" drops; 8 m, 12 m, 5 m, and 11 m. At this point things started looking up. Preston, who had descended the 11 m shaft first, greeted me with a smile as I undid my rack; "Looks like we have a deep one." And a deep one it was - 45 m down the wall of a fine 10 m diameter cylindrical well. Almost expectedly, another drop loomed just a few paces from the touchdown point. It was as if the entire cave were but one single shaft with a few ledges stuck in for entertainment. Three more pitches of 16, 12 and 6 meters and we were left with but one snarled chunk of goldline, and of course another shaft! We dropped rocks and estimated it at 15 m or so. After tying off to the rope used on the last 6 m pitch I rappelled in. The

rope never touched the small ledge where all our rocks had somehow landed. Instead it led downward into an ever expanding blackness that defied illumination from my waning carbide lamp. About 30 m into the drop I looked up to find the rope snagged on a projection some 10 m above. No amount of maneuvering would free it and I was forced to ascend. Once freed, the end drifted into the shaft with a swishing sound all too indicative of a rope to short for a successful descent. I continued climbing and swung to the 15 m ledge, whereupon Jeff rerigged the drop utilizing 20 m of excess rope from the 6 m pitch. After passing the knot I continued down into the void. At its largest dimension the shaft was close to 35 m in diameter with a light waterfall following the rope. I finally reached a 3 m wide ledge with but 10 m of rope left. Beyond, the drop continued. Rocks bounced for 5-6 seconds before drifting out of hearing range. There was little else to do but re-carbide and ascend. We had reached our limit for the day.

The final pitch was taped at 71 m freefall, and we began the long process of surveying out and derigging. Save Horowitz' spectacular sump diving exercise to retrieve a rope out of the deepest lake in the whole cave, the remainder of the trip was routinely arduous. After 17 hours, 15 pitches and 284 m of vertical work we exited into the moonlit doline just before sunrise.



[see loose map of Cueva de la Peña]

CUEVA DE LA PENA

Rancho La Presa; San Lois Potosi; Mexico

Suuntos and Tape Survey by

P. Forsythe — J. Horowitz
M. Hart — B. Stone

September 25, 1977

Data reduction and plotting by Ellipse
Drafted by Bill Stone October 1977
Drop lengths are shown on the profile

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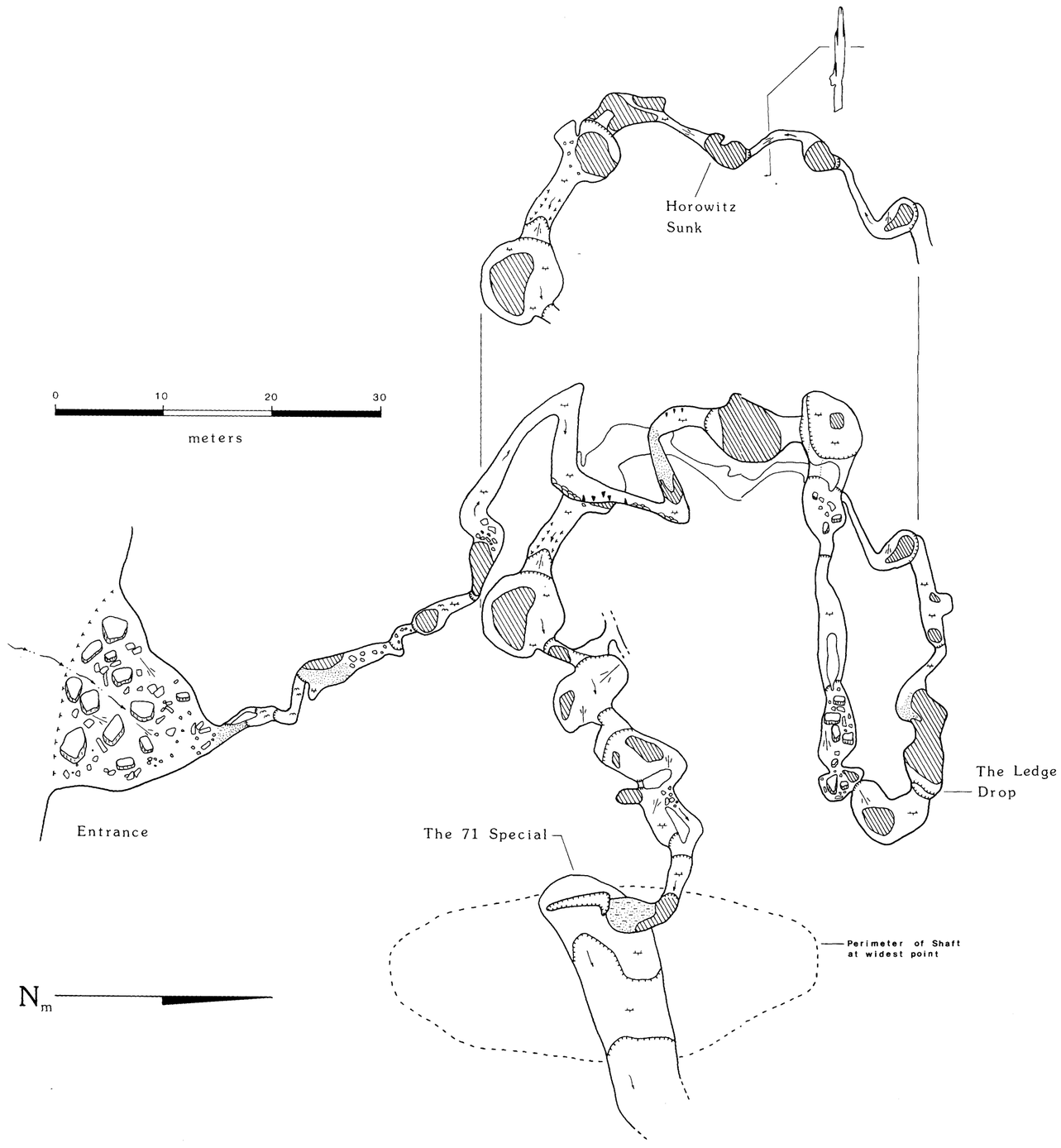

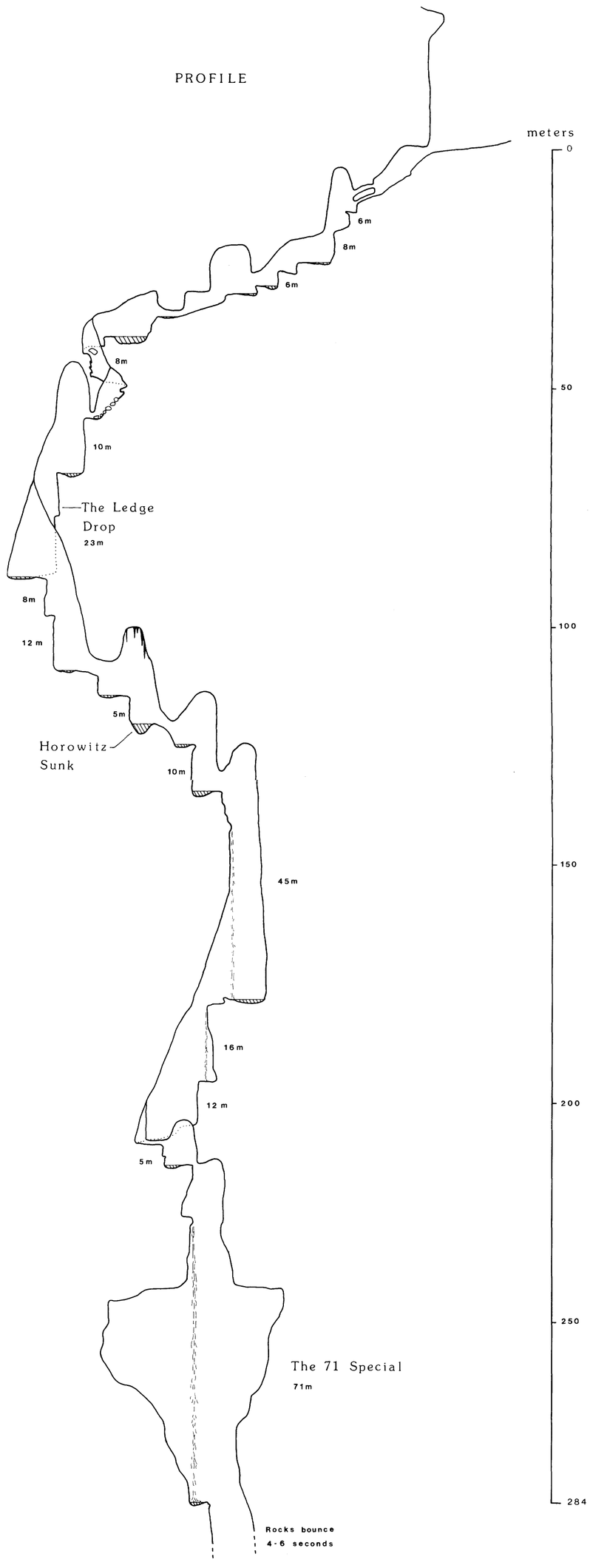

LA GRIETA

Plan Carlota, Oaxaca, México
Municipio de Huautla de Jimenez

SUUNTOS AND TAPE SURVEY

December 1976

F. Binney	R. Jameson
A. Cochrane	P. Mathes
J. Horowitz	B. Stone

May - June 1977

E. Garza	G. Stiles
J. Horowitz	B. Stone
T. Johnson	S. Zeman
W. Steele	

Total Traverse Length : 4100 m
Total Depth : 665m
Data Reduction and Plotting by Ellipse
Drafted by Bill Stone June-September 1977
Ropes required to rig each pitch are shown on the profile

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