
ASSOCIATION FOR
Mexican Cave Studies

NEWSLETTER

Volume IV Number 1

February 1973



ARTICLES

- Introduction
- Ten Years of Mexican Caving
- Sótano de Huitzmolotitla
- Grutas de Palmito I
- Grutas de Palmito II
- Sótano de Arroyo
- First Trip to Tequila, Veracruz
- First Speleological Survey of Mexico Trip
- Mexican Cave Exploration, 1962-1972
- Ten Years of Mexican Cave Biology

Tenth Anniversary Issue

The Association for Mexican Cave Studies
is a non-profit organization
whose goals are the
collection and dissemination
of information concerning
Mexican caves

The AMCS publishes a Newsletter
Bulletin and Cave Report Series
which are available

to any sincerely interested
conservation-minded person

The AMCS Newsletter
is published six issues per volume
as frequently as necessary
at a cost of \$4 US per volume

Information concerning
the other publications
is available upon request

Potential contributors are urged
to submit articles for publication

The article may cover any phase
of Mexican speleology

Trip reports are requested
from all trips

Send all material to

Association for Mexican Cave Studies
PO Box 7037 Austin Texas 78712 USA

Publications Editor Terry W Raines

Coeditor James R Reddell

Cave Files William H Russell

Secretary-Treasurer Jan E Lewis

Coordinating Biologist James R Reddell

Graphics Consultant Chuck Bryan

Production Manager Don L Broussard

Production Staff Frank Binney

Craig Bittinger Steven Bittinger

Brian Boles Walter Helmick

Dinah Monger Neal Morris

Carol Russell Barbara Vinson



THE SPELEO PRESS

Austin

=====

ASSOCIATION FOR

Mexican Cave Studies

=====

NEWSLETTER

Volume IV Number 1

February 1973



ARTICLES

Introduction
Ten Years of Mexican Caving
Sótano de Huitzmolotitla
Grutas de Palmito I
Grutas de Palmito II
Sótano de Arroyo
First Trip to Tequila, Veracruz
First Speleological Survey of Mexico Trip
Mexican Cave Exploration, 1962-1972
Ten Years of Mexican Cave Biology

Tenth Anniversary Issue

Introduction



James R. Reddell

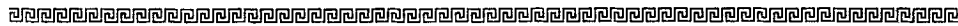
This issue of the AMCS Newsletter is devoted to a look back at the first ten years of the life of the Association for Mexican Cave Studies. It includes a few early accounts of the first ventures into Mexico by organized Texas cavers. This effort began in 1960 with the discovery of the Gruta del Palmito by the Alamo Grotto. That single event, more than almost any other, set the course that caving in North America was to take for the next decade. Even so it is hard to believe what has happened in only ten years.

As Director of the Texas Region Project at Bustamante in 1960 I have seen Mexican cave exploration evolve from the total confusion of giant “expeditions” to small highly-organized assaults on deep pits and complex pit systems. In reading these early accounts it is well to keep in mind that in 1958-1960 a 100 foot drop was a challenge and a vertical cave system more than 1000 ft almost unthinkable.

It is easy to gloat over our accomplishments, but we should also reflect on the fact that no good, complete maps exist of Gruta del Palmito, Sótano del Arroyo, or dozens of other major systems known from the first days of Mexican cave exploration. It is almost inconceivable that accessible and easily negotiated caves such as Sótano del Arroyo and the subterranean courses of the Río San Jeronimo and Río Chontalcoatlán are still not completely explored or surveyed. The interest in depth records has led to spectacular discoveries but it is sincerely hoped that the vast horizontal systems in Mexico will receive more attention in the near future.

Before we become too hysterical in our self-praise we should remember that for every species of cave animal described there is a cave description unpublished; that for every map of a Sotanita de Ahuacatlán published there is a map of Sótano del Buque undrafted; for every year of exploration there has been a year of procrastination.

Ten Years of Mexican Caving



Terry W. Raines

Ten years of cave exploration and ten years of unparalleled progress. Such has been the fortune of the members of the Association for Mexican Cave Studies. Who could have foretold the future when a young man, fresh out of college, ventured into the remoteness of Mexico in search of adventure. This man, Thomas R. Evans, was to be the father of organized Mexican speleology.

As reported in the following accounts, Mr. Evans (affectionately known as "TR") first ventured to Veracruz with the hope of a European voyage. When plans fell through the undaunted TR plunged into the interior. There, with a background in Texas exploration, he became ecstatic over the discoveries he made. Near the picturesque pueblo of Tequila, Veracruz, he discovered not only one or two, but tens of pits, locally termed *sótanos*, that were *muy hondo* or deep. In addition, entire valleys were found to abruptly end and the rivers to disappear into the blackness of great caves.

A month elapsed before TR made his way home to Austin, but still a vivid memory of Tequila's deep pits was fresh on his mind. He found it not at all difficult to excite fellow cavers at the University of Texas. They were soon more than willing to quit school and head south. Mexico's reputation for large caves had already been somewhat established by earlier reports. The Alamo Grotto of San Antonio, Texas, had located and partially explored Gruta del Palmito near Bustamante, N.L.

As a result of their exploration, the 1960 Texas Region Project was held at the voluminous cave overlooking Bustamante. The Project was successful in that it initiated the cave survey and, more importantly, it inspired cavers to make return trips into the region.

Another documentation of Mexico's speleo potential was made by Robert W. Mitchell. While studying tree ferns near Xilitla, S.L.P., he was guided to El Sótano de Huitzmolo-

titla. His interest in caves prompted a return trip and descent of the entrance shaft. The good word he subsequently spread about the pit and potential of the area was to be another factor which would promote a full scale assault on Mexico. The last factor which brought about a general realization by UT cavers of the wide-spread occurrence of truly great caves was the exploration of Sótano del Arroyo. During 1961, UT Grotto members with an interest in biology first visited Arroyo after reading reports of blind fish within a cave near Cd. Valles, S.L.P. In addition to finding the fish, they also discovered a large cave system. Such was the already excited atmosphere when TR brought home the news that was to change the course of speleology in the Americas.

I remember how distressed my mother was when she found me packing for a caving trip to Mexico. No one had ever heard of caves in Mexico, much less my mother. But above all, it was that two weeks of high school that I would miss that she disliked most. TR had done his work well, though, talking it up in caver circles and all, and as a result I was determined to go. I'm sure James, Bill, and TR were just as excited as I when we loaded the brown Plymouth stationwagon that had served us so well in Texas and headed to Mexico. Our only stop before the border was the 1962 TSA Convention in San Angelo which delayed us a day.

On following pages, TR well-documents this first trip of the Speleological Survey of Mexico (later named the Association for Mexican Cave Studies). Although our venture was most successful in respect to locating and exploring caves, I feel the greatest significance was the initiation of an organized study of the caves of Mexico. TR had recognized immediately the value of such an undertaking and was the prime motivating force. In the following year, one trip seemed to naturally lead to another and soon all Austin cavers had rallied to a common cause. A total effort was concentrated on the Tlamaya area, with Sótano de Huizmolotitla being the focal point. During the Christmas vacation of 1962 we surveyed 5231 feet of the system, which included the entrance drops of 364 feet and 156 feet, and pushed exploration another 500 feet. This seemed to be really big-time caving, and I guess it was, considering the equipment we were using. I remember back in those days a standard set of vertical gear included a seat sling with a locking steel carabiner, two carabiners with brake bars joined by a chain link, and two 3/8 inch sisal prusik slings. We were using a method referred to as the "Texas Prusik System", but back then it was the only way to climb a rope. (Fortunately, a comfortable climate prevailed within the caves we explored, requiring no additional protection over Texas standards.

Our vertical ways were soon to be modified, however. With everyone rushing off to Mexico at the slightest excuse, great progress was made as we pushed ever deeper and further into the unknown. The extensive horizontal systems of the El Abra were assaulted regularly in the early 60's, with perhaps Arroyo, Tinaja, and Tigre the best known. But the real strain on our vertical techniques came in the then deep systems near the Tlamaya village. Huizmolotitla was finished off in January of 1964 at -789 feet, at a point three km from the entrance. Immediately we got a lead on another pit system just across the ridge. As of course it didn't have a name, we referred to it as Sótano de Tlamaya. During July 1964 we surveyed down six drops to -841 feet. This record didn't last long. The Thanksgiving trip pushed the survey to -1281 feet, the Christmas trip increased the depth by 71 feet by surveying the Upper Entrance Passage. In July of 1965 the survey went to -1418 feet, and finally in September the lowest point was reached at -1488 feet below the Upper

Entrance. It was this exploration, the Tlamaya Campaign, that marked the dawning of a new era. The mechanical ascender was first utilized in the exploration of deep caves. Looking back, I can only conclude that we just didn't realize how hard we were working in the exploration of Huitzmolotitla or the pits of Tequila. In any case, after Tlamaya the Jumar Ascender became standard vertical equipment and from this stage on it was a matter of perfecting the most advantageous configuration.

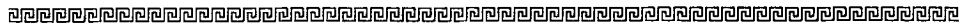
The preceding lines might seem to draw attention from the grandeur of Mexico's horizontal caves, but let it not be. All frontiers were being pushed as certainly all cavers have their preferences. Numerous groups made the seven hour drive to Bustamante and the previously mentioned Gruta del Palmito. It was somewhere during the middle 60's that an Austin group made the first "day" trip to Bustamante—a questionable precedence. Be that as it may, the spirit was nurtured and cavers surged onward into a decade of unprecedented cave exploration. Cacahuamilpa, Quintero, Venadito, Carrizal, Arroyo, Tinaja, Ventana Jabalf, Joya de Salas—those were the big names of 1965. And cavers pushed on.

At first only wild rumors: a high karst area, rivers disappearing in large closed valleys, sacrificial caves, basketballs bouncing down 1000 foot dolinas into pits. Such was Huautla's early reputation and the beginning of a concentrated effort in a new area. One record was set after another. Over a four year period, beginning in 1966, Sótano de San Agustín was explored and surveyed to a depth of 612 meters. It still remains the deepest known cave in the Americas. In 1967 Sótano de Río Iglesia was bottomed at -535 meters and a year later Cueva de San Agustín was found to be over 460 meters deep. These three caves comprise the primary deep pit systems of the Huautla Region, with many other caves of lesser extent known, and still more never even located. The area since has been less frequently entered by cavers.

Simultaneously, while the exploration of deep systems was being carried out in the south, the descent of unbelievable single-drop pits was accomplished in the north. The Xilitla Region had been the proving ground, with Huitzmolotitla, Porra, Pozo, and San Antonio all over 100 meters. Therefore, when the push into the Aquismón Region was made in 1967 all were prepared for what lay ahead—Sótano de las Golondrinas. The 334 meter rappel was truly astounding, and cause for the great flood of explorers that was to follow. Of course, other great pits and caves were explored in the area, but to this day many remain unentered or unsurveyed in the rush to do the big "G". Other accomplishments in the late 60's were less dramatic but in reality more important. Groups from Texas were persistent and by the close of the decade they had a good working knowledge of the caves along the Inter-American Highway in the front ranges of the Sierra Madre Oriental.

Within the last two years the areas studied by AMCS cavers have been more remote and far afield. Hiking into the back ranges of the Sierra Madre has become popular as evidenced by the discovery of such caves as El Sótano del Barro and Sótano de El Buque in the Jalpan Region. Both are a good day and a half hike from the nearest highway. El Sótano presently holds the world's record for the longest drop, surveyed to be 410 meters, while El Buque reaches a total depth of nearly 500 meters via 14 separate pits. Within other areas of this Region there certainly remain caverns of this caliber which have not been located or explored. This, as most are aware, still holds true for all karst regions of Mexico. Ten years is but a day in the many lifetimes that must be devoted to the detailed study of the Republic's underground.

Sótano de Huitzmolotitla



Robert W. Mitchell

I have been asked by Mr. William H. Russell and Mr. Terry W. Raines to informally summarize the results of some of my trips to Mexican caves. Some of these visits to Mexico have been particularly significant or interesting and it is upon these that I wish to dwell.

Perhaps the most important of the trips was one which I made during the summer of 1958, accompanied by Dr. Francis Abernethy and Mr. Tom Hayes. It was during this trip that we first saw El Sótano de Huitzmolotitla at Tlamaya, San Luis Potosí. The "discovery" of this sótano led in a somewhat round-about way to the eventual discovery of one of North America's deepest known caves, El Sótano de Tlamaya.

Ab, Tom, and I had headed for Xilitla, S.L.P., to meet Dr. Russell Strandtmann, formerly of Texas Tech, and a group of students. We arrived in Xilitla two or three days before Dr. Strandtmann's group, and during this time we chanced to meet a very interesting person, Señora Berta Semple, who lives in Xilitla. Explaining to her that we would like very much to see the tree ferns in the cloud forests above Xilitla, we were taken to Tlamaya to meet some good friends of hers who could probably arrange for a guide for us. These friends, later to become our dearest friends in Mexico and the friends of many a following spelunker, were Sr. and Sra. Modesto Gómez. We saw our tree ferns and were also taken to a small cave in "downtown" Tlamaya. Sr. Gómez asked if we would like to see a sótano near his house. After we finally understood that this was a cave of sorts, he led us through the coffee trees to it. Those of you who have seen an immense Mexican sótano can well imagine how we felt standing there peering down the sheer entrance drop of our first sótano. When asked if it had a name, Sr. Gómez laughed and said we could call it El Sótano de Huitzmolotitla after the name of his ranch. We dropped a few rocks and got nearly seven

seconds on them. We promptly decided that some day we would make every effort to descend this sótano.

Not until the summer of 1960 at the N.S.S. Convention at Carlsbad did I say much about this deep cave to anyone. However, I then talked briefly with Bill Russell and several others about the deep pit I had seen in Mexico, but I don't think I was entirely successful in selling the idea of such a deep cave to anyone, although rumors persisted of these deep entrance shafts in the Sierra Madre Oriental and elsewhere in North America. At least I didn't witness any mass exodus to Tlamaya.

About this time, Dr. Abernethy and I decided that it was high time we entered the Sótano de Huitzmolotitla, so during the early part of the summer of 1960 we began planning our effort for August of that year. At least to us these were still the days of cable and winch and a fairly large team of people. I shall never forget our discussions on how much cable to buy. This was finally resolved by my wife, Rexell, and me by our going to Tlamaya in July of 1960 and lowering a string into Huitzmolotitla. We got about 350 feet as a good estimate, and so Ab and I bought 400 feet of quarter-inch steel cable. We borrowed a hand-cranked winch, a veritable monster which had a handle that slipped out at very inconvenient times. We organized a crew the likes of which no cave will ever see again. Since each contributed in some very important way to our visit and since each contributed such a distinct personality which so flavored this trip which will live in the minds of each of us forever, I cannot but name each of them. All were associated at the time with Lamar State College of Technology at Beaumont, Texas, where Dr. Abernethy and I taught. I was teaching biology and Ab was an English professor. A prominent student of East Texas folklore, he now is Professor of English at Stephen F. Austin State College, Nacogdoches, Texas. His love of natural history and of pure adventure ranks him as El Número Uno whenever I am making a trip, especially to Mexico. Dr. Russell Long, still of the Biology Department at Lamar Tech, accompanied us, but his efforts were directed primarily to collecting butterflies in and about Tlamaya and drinking beer with Don Modesto. This only attests to the fact that Russell had more judgement than the rest of the crew collectively. Since our team was fairly large we decided we needed a cook, so we prevailed upon the manager of our snack bar at Lamar Tech, Mr. Starks Johnson. At the time this sounded like a great idea. The remainder of the people were students, all biology majors. There was first of all Mr. William Rhodes, who is now a chemist employed by Marathon Oil in Colorado. Dub remains one of the best friends, hardest workers, and finest field companions anyone could hope to have. Our association continues to the present. He, Ab, and I made our latest trip into Mexico only last August, a trip that will be described later. Mr. Kenneth Johnson, a graduate student of mine at the present time here at Texas Tech, made the trip. He is presently conducting studies on temperature preferences in the Mexican blind cave fishes. Mr. Charles Edwards was along. He now teaches at Port Neches High School. Mr. Leonard Tibbetts, who is now practicing dentistry, made the trip. I believe he now lives somewhere in the Beaumont-Port Arthur area. Mr. Roger Shoemake is just completing his Ph.D. in Acarology at the University of Oregon.

We arrived along with the first rains in Tlamaya in the latter part of August of 1960. We had come prepared to stay for at least a week, so we set up shop in Sr. Gómez' coffee shed, later to become somewhat of a spelunker's headquarters. Now the road to Tlamaya passes fairly close to the Sótano, but the walk down the 45-degree slope to the drop is

something of a chore with the kind of equipment we carried in. We had decided to set up the winch not on the last ledge before the drop but another ledge up. This placed the winch and winch operators some 20-25 feet above the drop and, I suppose, about 40 feet horizontally away from it. It was placed on the "high side" of the drop since getting to the low side was a real problem and also because there were no suitable ledges on the low side for the winch. Growing on the ledge below the winch and projecting out and over the drop was a large tree which we decided was the appropriate place for the block to support the cable. On our way through Mante we picked up about 500 feet of one-half inch sisal to use as a belaying rope. It was decided that the belayers were to take up their positions on the lip of the drop, again, somewhat below the winch position. About two days were consumed simply getting the winch into position and bolting it to a table we made for it one rainy day. But I will say that when it was finally in place it was there for all time to come. We spent most of the next day—after the rain—getting the block in the tree over the pit. Dub Rhodes and I tried to out-volunteer each other for this duty. I won. So I climbed up the tree and out on this large limb. Only when I was out 10 or 12 feet from the wall did I look down. After partially recovering from this experience, I set about trying to suspend the large block with a short length of cable. When I was about half finished, I suddenly realized that I was covered by ants. The limb was covered with them and there was simply no escape. This whole episode was quite painful.

To the end of the cable we attached a parachute harness. It was near the end of the day, but we decided to make a partial descent to test the rigging and to clear away vines, and larger plants that were in the line of descent. I went down carrying a machete. I cleared the wall down to about 70 or 80 feet when I came to rest on a tree, a very large tree anchored by three roots to the sheer wall of the pit. This thing was right in the line of descent, so I shouted up that I was going to chop down a tree and to lock the winch. After looking at the tree I decided that it would be easiest if I were to stand on the tree, chop away two roots, and then be winched upward so that I could lean down and cut the remaining root. I cut through the first root and the tree creaked and sagged slightly. The surprise came after I had cut about half way through the second root; the tree fell like a bomb. I took all the slack out of the cable in a hurry and slammed into the wall. Never have I heard such a noise as when that tree hit bottom. It literally exploded.

We were rained out the next day, but on the following day we made it to the pit early with every intention to put someone on the bottom. I must add now that we had also brought along a set of field telephones, since we thought it advisable to keep in constant contact. By now you realize that here we had three lines to be lowered simultaneously. Wishing if at all possible to avoid adding a fourth line, we decided to go ahead with a descent without a guide line which would prevent any possibility of spinning. I was lowered without incident to about 150 feet below the lip when a strong undercut was encountered. I called for everything to halt while I surveyed the rest of the drop. Then I called for some very fast cranking on the winch to get me to the bottom without delay. But after being lowered 20 or 30 feet more, everything began to spin like mad. The lowering cable, telephone line, and belaying rope all wound together, and the whole operation came to a sudden halt. The decision was made that I come up and that we attempt a descent the next day using a guide line. The trip up was agonizingly long because of the necessity to unwind the fouled lines. It was necessary to cut the telephone line several times.

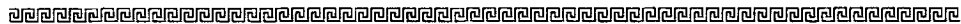
By this time I had decided that someone else could have the honor of being the first on the bottom, so the next day—with a guide line—Dub Rhodes was lowered to the bottom. After some time there he was raised. All this went with little incident. The next day Ab and I both were lowered. Ab went first and with no problems, but my trip down was marked with one interesting incident. When I had reached within about 15 feet of the bottom, the telephone line snapped near the top of the drop. The sound of 350 feet of line whistling down a sótano is undescrivable. As those of you know who have been into Huitzmolotitla, we found little at the bottom of the entrance drop except for another vertical pit. Beneath a large ledge we suspended a vial with the names of those of us who made the descents on this first trip. The vial has been seen by some of the spelunkers who have followed.

Along toward late afternoon I was winched out. At some time during the trip up the handle came out of the winch but Dub locked the brake so fast that I was unaware—in fact, I didn't learn about this for several years. Also during this ascent the winch operators and the belayers became very unsynchronized. The belayers were not hauling up rope as fast as I was being raised by the cable. The result was a great loop in the belaying rope. I called for the people on the winch to stop cranking while the belayers took up slack. They did this very rapidly. I seem to recall that I was being very ugly over the telephone at this time. They took up the slack so fast that they raised me about three feet vertically now creating a sag in the main raising cable. I shouted into the telephone for some slack in the belaying rope so they threw me about a loop. The three feet I dropped before being stopped short by the cable was a long trip.

This venture was spiced with many other incidents and diversions, some relating to the Sótano, some not, but I have already rambled on too long about Huitzmolotitla. Initially, it seemed that we accomplished very little other than the mere act of entering the entrance drop of a deep cave. But as it now turns out, it amounted to something more. An interest in this area and its caves was generated which eventually led to the complete exploration of Huitzmolotitla and the discovery of the nearby Sótano de Tlamaya, one of this continent's deepest mapped caves.

Those of us who knew them were grieved when Sra. Gómez died in the early 1960's and again in 1966 when we learned that Sr. Gómez had been killed while driving his old pickup on the Pan Am near Valles. Xilitla, Tlamaya, and their cuevas and sótanos will never seem the same, especially to those of us who stayed at their ranch during the early days.

Grutas de Palmito I



M. D. Doyle

I wish that I could write this without going into superlatives, but this is quite impossible, so I will stick to an account of our trip.

On Friday, 25 March 1960, a party of twelve members of the Alamo Grotto set out for Mexico to run down a rumor of a fabulous cave. We arrived at our destination at 4:30 in the afternoon after traveling for the last twenty miles over roads which were so bad that they must be seen to be appreciated. The town was a little, sleepy place which really came to life when we drove in. The "Comandante de Policia" immediately took over and rolled out the red carpet. There was nothing that was too much trouble. Due to a misunderstanding of our arrival date they were not prepared for us. However, they went right to work and at 9:30 that night we sallied forth on our journey.

A pack train met our truck about two miles from the town and our gear was transferred onto the backs of five weary burros. The climb up the mountain was terrible. A makeshift trail zig-zagged up and up for almost two and a half hours. Reaching the mouth of the cave at 1:30 in the morning, we crawled into our sleeping bags and immediately fell into an exhausted sleep.

We were awakened at dawn by a bunch of lousy birds. A hurried breakfast was gulped down and we entered the cave with our two native guides and our burro driver who knew the place. We had hired them as we only had one day and didn't want to spend valuable time in looking for the best rooms.

Inside we climbed down a breakdown grade of about twenty-five degrees for a distance of about 200 feet to a floor. Ahead lay a series of huge travertine dams. The largest estimated to be four feet deep, four feet wide and about fifteen feet long. Several were filled with good, clear water which we later used for drinking and cooking. Beside the dams were

fabulous speleothems of all descriptions.

The assault party had left the photo group and were about an hour ahead. We followed with our guide to the top of a hill of breakdown which was several hundred feet high and very steep. A tiny light glowed at the bottom—a candle that our boys had left. We climbed down over piano sized rocks and ended up in a room which was breathtakingly beautiful. Calcite formations of all descriptions in colors of rust to pure white surrounded us. Our photographic group went mad.

From then on it was just more and more. Each room seeming to be more beautiful than the rest. Slim totem poles reached up fifty feet or more to touch the ceiling—massive dripstone columns twenty feet wide by ten feet thick—curtains—drapes—everything. I recall one formation of red which looked like a pine tree—white calcite had formed over its top, giving it the look of a snow covered tree.

Our assault party returned to report a cascading flowstone river 150 feet wide and 400 feet long—a terrific sight. The photo group was deep in beauty and so busy that we did not have time to go down to see it.

Erwin Wesp had a wide angle lens on his Exacta, and was able to cover the entire formations. My trusty Argus C3, with its standard lens wasn't quite able to do the job. The formations were high and the rooms were so large that they afforded no light bounce. I did shoot 2 rolls, however. Wesp, on an aesthetic binge, shot ten rolls.

I do not want to continue, as this cave must be seen to be believed.

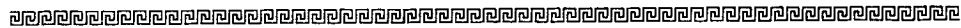
We observed no flora. However, someone had left some avocado seeds deep within the cave. These had sprouted and their shoots were standing about eighteen inches high, their roots a twisted mass on the rock floor. They were dead white and one shoot had put out two tiny leaves, both white. Of fauna there was evidence of mice or rats near the opening. Some small cave crickets and a few, very few, insects were to be found. These will go to Dr. Barr.

Our group feels that this is a most important find and would like to return with a survey team possibly from the UT Grotto. We would most heartily recommend that this cave be made a Region project. However, it is rugged, very rugged, both inside and out. Softies should not try it.

This trip was planned by the Alamo Grotto and the following members were on the tour: M.D. Doyle, chairman; M. Barillet, secretary; Dennis Doyl, quartermaster; and Erwin Wesp, M. Martinez, M.D. Jordan, Jr., Jim Carpenter, Montey Killian, Hoad Lewis, Jack Huffman and Ron Morse.

from The Texas Caver, v. V, no. 2, p. 8.

Grutas de Palmito II



James R. Reddell

After weeks of preparation the Texas Region Project got underway, to everyone's surprise. Seventeen members of the University of Texas Grotto met in Laredo on the first stage of the trip to Bustamante, Mexico. Reports, obviously exaggerated but intriguing nonetheless, had inspired the selection of La Gruta de Bustamante for the project.

The group left Laredo at 6:15 p.m. on November 24, 1960 on the train and arrived at 8:45 p.m. To our dismay the truckload of food and a car load of scientific instruments had not arrived. We were met by the Commandante de Policia who offered us the use of the school for the night. The next morning the food and equipment had not arrived, so, buying what emergency rations of bread and tortillas we could find, we struck out on the 2,000 foot climb up the mountain, led by the local padre and several boys. In an hour we were at the cave, looking in amazement at the high mountains, the valley below us, and particularly at the tremendous anticline across the canyon from the cave.

The entrance to the cave is little more than a stoopway enlarged somewhat by the natives. The cave itself is more impressive. After the small entrance, the blackness is awe-inspiring. A 30 degree talus slope drops a total of more than 100 feet, a distance easy to exaggerate because of the size of the room at the base of the slope. The room is 400 feet across and about 300 feet wide. Its ceiling is from 50 to 100 feet from the floor. It is perhaps incorrect to speak of "rooms" in Bustamante for the cave consists almost entirely of one huge passage broken into several sections by great quantities of flowstone and breakdown. The first "room" is separated from the second by a massive conglomeration of flowstone, columns, and a gaping pit at least 75 feet deep. Behind this first room and before the Paso de Muerte there are dozens of formations, some reaching 50 to 75 feet in height. Past this area of formation there lies the Paso de Muerte, a gaping 100 foot plus pit which may be by-

passed on the left by a narrow ledge in which steps have been cut.

Camp was set up at the base of the large entrance slope beside a number of 2-foot to 6-foot high travertine dams. About 100 feet back from the camp many of the dams were filled with water, and beyond these, dry dams contain huge cave pearls several pounds in weight and six to eight inches in diameter. In February, on a return trip by five members of the UT Grotto water was found issuing from a four inch diameter spring and running in miniature waterfalls over the dams almost to the site of the camp. The presence of the spring is obviously related to a number of cracks found over the cave from which a current of warm air flows.

It is extremely difficult to describe Bustamante without losing yourself in superlatives. Our first glance of the cave had been nothing as compared to what lay beyond the Paso de Muerte. In the lost history of the cave a wire had been run from the entrance to the back of the cave. This served as a trail, supposedly laid either by a general who had used the cave as a camp or by a man attempting to commercialize the cave. Needless to say, the difficulty of the trail leading to the cave had doomed his attempt to failure from the start. The view of the breakdown slope from above the Paso de Muerte is one of the best in the cave. A three-cell flashlight is completely lost in the black appearance of the gigantic room lying at the bottom of the huge breakdown slope, which itself drops a total of 325 feet vertically at a 30 degree slope. The passage at this point is about 200 feet wide and better than 50 feet high, but the impression of size is gained primarily from the tremendous drop into blackness. The trail crudely follows the center of the slope and at the bottom of the room goes immediately to the right wall where it bypasses a huge breakdown to the left, instead winding its way among 20 to 50 foot columns and other formations, finally dropping down a steep slope into the Cathedral Room. In this large sandy-floored room the local people hold mass each Easter before an altar of beautiful white flowstone reaching up for 40 feet. A hole in the flowstone admits the caver into a gigantic room, 400 feet long, 150 feet high, and 450 feet wide. The room ends in a 100 foot high flowstone cascade, holes in it dropping 30 feet to a number of small rooms. These rooms are the prettiest and most delicate in the cave. The Sala de los Vampiros is a small room, completely orange with many beautiful orange war clubs and in the back an unbelievably red deposit of flowstone resembling blood. The Cave Ice Room contains a pool where once it had been a 15 foot deep lake, as evidenced by a waterlevel marked by orange below and white above the water level. The surface of the pool and the sides are covered by an eighth of an inch thick layer of orange cave ice. The Crystal Rice Pool is a clear pool with an inch of loose white crystals, resembling rice, on the bottom. A 25 foot drop follows into a room containing a tremendous flowstone river hundreds of feet long and 100 feet wide which ends in an 80 foot sheer drop to a small passage through flowstone to a very high unclimbable bank of flowstone rising above the floor of the cave.

The most impressive area of the cave lies along the left wall from the base of the breakdown slope to the end of the cave. A Hall of Giants has been created out of two huge banks of flowstone and columns reaching to the ceiling, 100 feet or more above the floor of the cave.

After returning from a guided tour of the cave by the padre we found that our compan-

ions had still not arrived. By now we were beginning to worry about our food supply—and our companions. Exploratory crews were sent out and a survey crew, headed by James Reddell, proceeded to map the first room of the cave. This accomplished and everyone tired, we climbed to the surface in hopes of finding a four-day supply of food awaiting us. After a hearty meal of bread and water we sat around a campfire, when the welcome shouts of companions came to us from below. From dark until 2:00 a.m. stragglers appeared with tales of cars ruined and abandoned along the roads to Bustamante. Our food, however, was waiting to be sent up by burro and waited until morning. In the meantime we were serenaded by the Mexican boys and had hot coffee to drink—so all things were not so bad as they could have been.

The next morning we waited hungrily amidst great confusion as members of the Alamo Grotto and Dallas–Fort Worth Grotto arrived. Despairingly, we finished mapping back to the Paso de Muerte and at 2:00 p.m. returned to the surface to find hot food waiting. Tom White, head of the meteorology crew, also arrived in a not too silent despair. His Volkswagen and meteorological equipment had to be abandoned after the roads to Bustamante had forced him to turn back to Nuevo Laredo.

That afternoon Bob Littlefield and other members of the Dallas–Fort Worth Grotto set out with M. D. Doyle and Irwin Wesp of Alamo on a picture taking tour of the cave. The real work of surveying the cave finally got underway with the survey crew consisting of Bud Frank, Bob Benfer, James Reddell, Alice Hirsch, James Strickland, and Philip Russell. Two crews set out, but a tape not in working order soon put one of the crews out of commission. One crew did the survey of the cave, alternating between mapping and looking. It was obvious from the start that a complete map could not be made on one trip. The only possible way to work was by following the walls of the cave, making a grand circuit about it. By following the right wall we reached, in 15 hours, the top of the 80 foot drop past the flowstone river. Here, exhaustion and a near accident convinced us that it was time to go to bed.

Next day the same crew, while camp was being broken and attempts made to straighten out a hopeless misunderstanding as to the price of the burros, set out on a frantic attempt to map the second half of the cave. The map of the left wall was begun, and seldom have surveyors had such a beautiful job. In this section of the cave, only a very few people have ever been. The formations are virtually unmarred by names and initials. Closure was made around the last room, obtaining remarkable vertical closure for a Brunton survey. Our exit from the cave and the mountain was uneventful, though a sense of depression had settled over everyone that we were leaving a beautiful cave and a wonderful town.

The beauty and grandeur of the mountains and the cave itself had been supplemented by the hospitality of the people of Bustamante so that we left with nothing but regret and a determination to return.

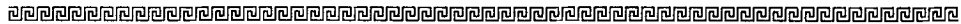
Our return trip was made in January between semesters at UT, and the left wall of the cave was mapped to completion. This time we found the cave wetter and perhaps a little smaller, but nonetheless the most beautiful and impressively wild cave any of us had ever seen or ever hope to see.

The trip itself emphasized one thing: Region Projects are for one purpose, and until this is realized they will always be failures. They are for the purpose of cavers from all over the Texas Region getting together, sitting around campfires and talking caving. This is more

than enough justification, and if a map is made of an extensive cave system which could not be mapped otherwise in one brief trip, this is as much a part of getting to know other cavers as sitting around a campfire. Hopes to turn a Region Project into a major scientific expedition to any cave will probably always fail, if for no other reason than that there aren't that many qualified people in Texas with enough time or interest to do it. Looking at either the Felton Project or the Bustamante Project from this viewpoint they must be counted as dismal failures, but looking at them as projects at which people got to know and cave with one another and see a great cave and enjoy themselves, they can only be considered as tremendous successes. Certainly this applies to me, as Chairman of the project and, I think, to everyone I have spoken to. This, in my opinion, is more than enough.

from The Texas Caver, v. VI, no. 2, p. 15.

Sótano de Arroyo

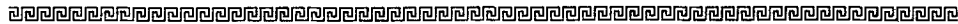


James R. Reddell

Jim Reddell reports from U.T. that he, Orion Knox and Mills Tandy made a trip to Mexico during the Thanksgiving holidays to visit a large cave near the town of Los Sabinos, eight miles north of the town of Valles on the Pan-American Highway. The cave is called Sotano del Arroyo, or literally "The cellar of the Arroyo". A very large and wide and long arroyo which drains thousands of acres ends in a 200 foot high cliff with the sink entrance to the cave immediately in front of the cliff. A remarkably large main passage about 3,000 feet long was explored with several promising passages left untouched because of lack of time. The two side passages that were checked were too much for them, as one ended after about several hundred feet with a 40 foot drop, and the other continued for several hundred feet as a 30-foot wide and 20-foot high passage. There is reported a lake teeming with blind fish. In the same area as Sotano del Arroyo, and less than one kilometer away, there are two more caves. One, La Cueva de los Sabinos almost certainly connects with this one, while the other, Sotano de la Tinaja probably does also. Both are large and have huge entrances requiring rope either at the entrance or back in the cave. Fourteen hours were spent in the explored cave.

from The Texas Caver, v. VII, no. 1, p. 5.

First Trip to Tequila, Veracruz



T. R. Evans

Having graduated from the University of Texas, I was bound and determined to travel and had great hopes of getting deck passage from Mexico to Europe for \$25–30 as I had heard was commonly possible. A friend, Steve Plasky, agreed to go and planned to meet me in Veracruz a little later. Vietnam had not mushroomed then, and I was readily granted a 6–months’ deferment to allow me to leave the country.

Tampico was the first port I checked. A few ships came and went, but nothing was sailing for Europe. A few days later, I took a bus to Veracruz (via Mexico City) and rented a bed in a “pensión” for 5 pesos per day. Immediately, I began checking the ships in port for something going to Europe, but had no success. Steve arrived in a couple of days, and we continued the checking. We did turn up a couple of ships that were sailing for Europe, but were told that if we wished passage that we would have to book it through their regular agents in Veracruz. Most of the ships were flying European flags, but were chartered to American companies and engaged in trade between the US and Mexico and Central American countries. Veracruz in June is the most humid and hottest (thus miserable) place to be in Mexico. We put up with the weather as long as we could take it (a couple of weeks) and decided to retreat into the mountains and a more favorable climate. Checking a map, we decided that Orizaba was the place we wanted to be and went.

Orizaba is a good sized city on the highway between Veracruz and Mexico City at an altitude of 4500 feet or so. The climate there was cool and damp. Surrounded by mountains, Orizaba is one of the most scenic cities I have seen in Mexico. There, we had the good fortune to meet Prof. Gabriel Mendoza (a high school English teacher) and his family. Prof. Mendoza helped us get a two room flat located behind his house. The place was unfurnished, but cost a mere \$8 per month. Steve and I had our sleeping bags and set up house-

keeping on the floor. At this point, we had given up any hope of getting to Europe and had decided to spend our time in Mexico.

We had minimal caving gear along as we had planned to do some spelunking where ever we wound up, and inquired about caves in Orizaba and soon discovered that many were around—and that most of the mountains nearby were composed of that good stuff called limestone.

The first caves we visited are located near the village of Tlilapan (5 km S of Orizaba on the road to San Andres and Tequila). The first cave is in a rock face on the right side of the road about 2 km before reaching Tlilapan from Orizaba. The cave's entrance is large and a vertical crack must be climbed to get to the main cave. The crack in the cliff face leads to a room 50 to 75 feet high and 10 to 30 feet wide, and perhaps 30 feet long. We could see no leads. A few old formations are present. Guano exists in the cave, but there were no bats there when we visited the cave. The spectacular view of the valley below from the cave's entrance makes the climb through the tropical undergrowth up to the cave worthwhile. We checked this cave on 23 June 1962.

The second cave in this vicinity that we visited is located above a spring at Tlilapan. Many of the village women do their washing there. The cave has a large entrance easily seen from the spring and about 100 feet above it. Most of the cave is guano covered and messy, although the cave is generally large enough to walk in. Much breakdown is present. The cave contains one well-decorated and clean room reached by a narrow fissure (near the end of the cave) which leads up into the room. We were not able to get down to any sign of a stream passage. The cave is inhabited by bats and swallows, and air seems to move slowly out of the cave. Estimated length of the cave: 400 feet. Checked 23 June 1962.

The third cave is along a dirt road which goes left off the paved road as one goes from Tlilapan to San Andres. The dirt road is just past the first bridge outside Tlilapan (towards San Andres). A copious amount of water issues from the entrance which is 4 feet wide and perhaps 5 feet high. The main passage is 8 to 15 feet high (above water, if I remember correctly) and contains 3 to 6 feet of water. Wading is necessary. The current is very swift in places and a couple of side passages on the left of the main passage were not checked because of the swift water. These side passages are 2 to 3 feet wide and 6 to 8 feet high. The main passage terminates in breakdown after a couple of hundred feet. High fissures exist here and are probably climbable. It is most likely that the water sinks on the hill above and drains into the cave. Length of explored portion: 150 to 200 feet.

On the 27th of June I checked a couple of more caves we had been told of. Steve was incapacitated with that common Mexican malady we all get sooner or later, so I went alone. The first thing I checked is known as La Cueva del Moral and is several km up an arroyo from Nogales (another town near Orizaba). I was led to a small depression in the base of a cliff along the arroyo and assured that a grand cavern once existed there. Legend has it that a robber buried some loot there and sealed the entrance fifty years ago. From what I saw, it is doubtful if a cave ever existed there. It is possible that a cave by the name La Cueva del Moral exists somewhere in the area and that I was shown the wrong place.

Despite the disappointment I felt after spending the morning being shown the "Cueva del Moral", I felt better after a trip to La Cueva del Balcón del Diablo. This cave is off the highway on the left as one goes towards Mexico City from Orizaba. A few km from Orizaba is the town of C. Mendoza—along the highway. Two entrances can be seen from the high-

way. The lower entrance is the larger. After a tiring hike up the side of the mountain, I arrived at the lower cave and looked in. To my surprise the end was only 15 feet away. I was at the base of a cliff with nowhere to go but up and upon looking more closely, saw that the cliff bore signs of having been repeatedly climbed, so started up. Some 40 feet later, I arrived at a balcony and the entrance to the cave. The small entrance, perhaps 4 feet square, opens immediately into a large room about 100 feet across—and most impressive. I ventured forth for several hundred feet before deciding that it probably went forever and exited. Steve and I both returned later and found a passage about 20 feet x 20 feet leading upwards at about 20 degrees from one end of the room. This passage terminated after several hundred feet. The whole cave is perhaps 500 feet long and inhabited by bats and swallows. The floor is muddy and very slippery in places. A few formations are present—chiefly in the form of flowstone.

On the 29th of June we checked another cave we had heard of near the village of Ojo Zarco (the Orizaba-Acultzingo bus goes past Ojo Zarco). A spring with a shrine above it (rocks painted white, too) is located a couple of hundred feet below the cave. A small trail leads up to the cave. This cave is on the right side of the highway as one heads towards Mexico City. This cave is an easy morning's trip to and from Orizaba. La Cueva de Ojo Zarco is different from the ones we had previously seen in the area. The entrance is a small hole 3 feet across which leads to a series of interconnecting fissures varying in size from 1 foot wide and 3 feet high to 8 or 10 feet wide and 20 feet high. We explored 400 to 500 feet of the cave and did not check everything. We found no water in the cave and no formations to speak of are present. A few bats were seen.

The name of a cave called La Gruta de Atoyac had come up several times, so we decided to have a look at it. It is located near the village of Atoyac about 15 miles from Orizaba. (Trains leave Orizaba at 4 and 7:30 AM and return from Atoyac at 2 PM. It is possible to get a bus from Orizaba to Cordoba and from Cordoba to Atoyac, but the trip is very rough.) From Atoyac, follow the tracks a km or so towards Veracruz. Go through the first railroad tunnel and proceed to the second. Just before the second tunnel is encountered, a small trail leads down the gorge to the cave. The cave is 1500 feet long or so—mostly all walking—with ankle-deep water in places. Some crawling is necessary. The main passage appears to be an old stream passage and is 10-15 feet wide and 15 to 40 feet high containing many formations and flowstone. The cave's formations are virtually all alive and much dripping water is present (rainy season). Cave crickets, bats and other fauna are present. Although the cave appears to have been visited a number of times by local people, little vandalism has occurred. The people at Atoyac said that many other caves are in the area.

On 7 July 1962 we went from Orizaba by bus to check out a cave we heard about near the town of Acultzingo. We were unable to locate the one we set out to look for (reportedly quite large), but did find a couple of interesting caves in what appears to be a limestone (or volcanic) conglomerate. The caves are small and close to each other. Each is about 15 feet long, 15 to 20 feet wide, and 5 to 6 feet high. The blocks which are cemented together are about twice the size of a softball. These caves are located on the left as one goes towards Mexico City and can be seen from Acultzingo relatively low on the hill.

Steve again became incapacitated so I took a leisurely trip to San Andres and inquired about caves. I saw a road going up the mountain and asked where it went and was told to Tequila and Zongolica. The people at San Andres also reported caves in the area around

Tequila. A bus leaves Orizaba early in the morning for Tequila and Zongolica, so the next morning, I found the station and went up. It soon became evident that things fantastic were going on and every km of the ride became more interesting. Tequila lies about 2000 feet above Orizaba in excellent karst country. Blind valleys, sinks, and large dolinas are abundant in the area and I was really amazed at it all. The only things I had seen to match it were the sinks in the Mammoth Cave area and some of the caves in Greenbrier and Pendleton Counties, W.Va. Getting off the bus, I inquired about caves. I was really surprised to find that there was one—about 3 hours walk away. Walking down the road, I passed a sink and threw a rock in. It went down. A little farther down the road, I came to a fork in the road (El Crucero) and found a sink by a house and threw a rock in. It went down, too (to the tune of 364 feet we later found out). At this point, I wondered what in the hell these things were if they weren't caves. A friendly soul informed me that they are not "cuevas", but "sótanos"—and sótanos they had. Ecstatically, I went around looking at these things which seemed to be everywhere. Still not believing my eyes, I returned to Orizaba and told Steve that he had to see the area "touristas" or not. We went back the following day and found other pits and immediately made plans to return properly equipped. We figured most of the caves were 150 feet deep at most.

Steve was really beginning to feel lousy so returned to the states, and I headed on down to Yucatán and didn't return to Austin til August. Virtually everyone was tied up so we didn't get back till November when Terry Raines (then an 11th grade high schooler), Bill Russell, James Reddell, and I returned. We had a 600 foot piece of nylon and a 200 foot piece of manila (I had purchased that manila when planning to return alone and check some of the entrances). The first one we checked was 364 feet deep—a wee bit over 200 feet.

Several trips have been made to the Tequila area since. Most of the pits there go down fairly deep, but reach no system. The whole area is a huge dolina with all drainage subsurface. No resurgences occur for a vertical distance of between 2000 and 3000 ft. Perhaps further checking will produce a sizable system in the area.

We took the bus from Tequila to Zongolica (a scenic trip over a rough road) and noted several cave entrances along the way. Zongolica is located in the bottom of another huge dolina, but we found no pits. The water drains from the dolina into cracks along the bases of the hills. The cracks are filled with debris and cannot be entered. From Orizaba to Zongolica requires about four and a half hours by bus.

The following are some caves we heard about while staying in Orizaba:

(1) At Atchalpa, Ver. (near Naranjal) a few miles from Orizaba, a barranca empties into a large sótano (reportedly 20 x 20 feet) at the base of two mountains. The pit is located at one end of the village which is 2 to 3 hours walk from Naranjal. Prof. Mendoza says when he was a child, large trees once stopped the entrance and the water flooded Atchalpa, making it necessary for the people to evacuate their homes for 6 to 7 weeks. Few people know of this sink and it has not been explored.

(2) On the trail from Atchalpa to Zongolica is a sótano (4 hours from Atchalpa on foot) about 45 feet in diameter and of unknown depth. A stream runs into it creating an ever-present vapor cloud rising 50 to 60 feet above the entrance. The pit is 40 to 50 feet off the trail and is easily seen. Two days are reportedly required for a round trip. For further information contact Prof. Gabriel Mendoza, Orizaba, Veracruz.

(3) Seven km from Zongolica by trail there is reported to be a large cavern. Inquire at Zongolica.

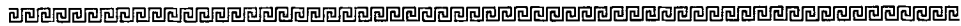
(4) There is a definite cave near Paraje Nuevo, a small town on the road to Atoyac. Pictures in a 1933 newspaper shown us in Orizaba look impressive. Many formations are present. Permission to enter the cave should be gotten from the sugar factory located nearby and owned by Americans.

(5) Eight km from Cordoba is a hill called the Cerro de Matlaguahues. This hill reportedly contains caves and vertical shafts.

(6) Near Tuxtla, Chiapas at a village called Chicuzen (5 km from Tuxtla) is a cave of unknown length which has paintings on the walls near the entrance. This lead was gotten on the trip to Yucatán from a person who had been to the cave.



First Speleological Survey of Mexico Trip



T. R. Evans

The first trip for the Speleological Survey of Mexico (SSM) started with the T.S.A. San Angelo convention. It ended with the meeting of other University of Texas spelunkers in Valles, San Luis Potosi, for a trip out to El Sotano de la Arroya near the village of Los Sabinos. Terry Raines, James Reddell, Bill Russell, and myself, all members of the Survey, went on the two week excursion in order to examine two promising Karst areas.

Sunday, November 11, 1962, found us rushing madly around Nuevo Laredo buying bus tickets, and trying to get through customs before our bus left. After a 24-hour ride down the Pan American highway, we arrived in Mexico City. Six hours later, at 1:30 AM Tuesday, we arrived in Orizaba, Veracruz. Immediately, we went to a professor friend of mine, Gabriel Mendoza, whom I met this summer, and sacked out for the remainder of the night. At 8:00 AM we got our packs together and went to catch the bus to Tequila, Veracruz, some 20 kilometers from Orizaba and 2,000 feet higher than the nearest running water.

We had missed the morning bus, and had to wait until 4:30 that afternoon for another. In the meantime, we went walking in the nearby mountains and located a pit area. Terry and Bill came across the area and had time to make a quick reconnaissance of only one shaft, which occurred 1,000–1,500 feet above the nearest resurgence. A rock fell free for four seconds and bounced for another two seconds before reaching the bottom. Time did not permit exploration of this pit and an Indian farmer assured them that many others existed in the area.

Finally, the bus for Tequila arrived and we were off to one of the two main areas that we had come to examine, an area of karst that I happened on to this summer by pure chance. We arrived in Tequila around 6:30 PM and went to the house of the secretary of the village with a letter of introduction that Professor Mendoza had written for us. The following three

nights were spent at his house. That evening, accompanied by some ten Indians, we explored a *sotano* (pit), that I had seen this summer, but did not check out. The Indians watched from above as we entered. After a series of climbable drops amounting to a total of 100 feet, we were at the bottom and the end of this cave.

Wednesday morning at 7:30 we proceeded to a "150-foot" pit that I had located this summer, but did not check out because I had no equipment along for vertical work. This time, we were prepared: 600 feet of duPont 707 NYLON, 100 feet of 9/16 NYLON, 100 feet of PERLON, and a 30 foot cable ladder. The 600 feet was 1/2 inch in diameter. We rigged the pit with the 600 feet and two of us rappelled in using breakbars. The spectacular pit is 20 feet in diameter at the top and bells out to 100 feet at the bottom. Five wells comprise the pit and the vertical fluting in these wells makes them even more impressive. After finding no passages at the bottom, we started prussiking out. About 30 feet off the floor, I had loop trouble, and after hollering for a while, finally made Russell (topside) understand that I wanted him to lower my other set of loops on his PERLON. When he did this and I could not even see the end of the PERLON, we suddenly realized we were far more than 150 feet down! In measuring the rope after we got out (a 35-40 minute prussik), we found that the pit was 364 feet deep.

By now it was noon, and we ate some *tortas* (Mexican sandwiches of sorts), and drank numerous "refrescos" (soda water).

For the afternoon, we divided into two groups and began locating and checking out other shallower pits. At that evening around six o'clock, we discussed what we had found. Raines and I found two pits, one over 200 feet deep and the other 300 feet plus. We had also checked out six pits ranging from 30-75 feet deep. Russell and Reddell had done well, too. They found three pits which streams enter (these streams resurge and sink in the same area) . . . one was a spectacular pit at the bottom of a 100-foot waterfall. A siphon, a drop, and lack of time stopped exploration in these. It was decided to spend Thursday morning checking out the 300-foot plus deep pit Terry and I found.

The top of the pit is some 15 feet in diameter, not too impressive. At minus 100 feet, the ceiling cuts back and out so that we found ourselves at one end of a room 75 feet wide and 100 feet long. The floor was out of sight some 250 feet below. A series of six wells ran around the room, making this room the most impressive I have seen in any cave.

At minus 150 feet, a ledge was encountered which the rope went by, and which may be used as a resting place.

At the bottom of the 350 feet, we were in a room at least 75 feet by 100 feet and some 250 feet high. The floor was chiefly of football-size breakdown. When we reached the bottom, we were at one end of the room at the top of a fissure which drops another 100 feet and shortly there-after another 100 feet--the latter drop through a small waterfall. Our 600 feet of rope ran out here; however, we were able to continue down the passage some 50 feet and encountered a 40-50 foot drop which we could not negotiate. The rest of our equipment was on the surface. Water moved down this passage and air was moving out. The cave could very possibly drop another 1400 feet or so before the water resurges. These last two drops, (the two 100's) are downstream in the main fissure passage.

Upstream we explored about 1,000 feet in a fissure passage which contained the stream, and which terminates in a dome-pit 25 feet in diameter and over 100 feet high. The bottom of the downstream end of the upstream water passage ends in breakdown under the

big room and emerges at the top of the second 100-foot drop on the other side. This upstream passage is a fissure 100 feet high entered 75 feet above the running water.

We got out of this cave most impressed, ate lunch, and again spent the afternoon locating other pits. The most notable find was the "Infinity Pit" found by Russell some 1,000 feet above the entrance to the 350-foot pit. A rock can be heard distinctly for 10 seconds after it is dropped—after which it fades from audibility! Thus, the pit is probably at least 350 feet deep and possibly more. The vertical potential is a thousand feet more than most of the pits we visited. Most of the pits occur near Tequila which is near 6,000 feet above sea level. There are prominent resurgences in a valley at 4,000 feet, giving a good 2,000 feet vertical possibility.

We packed our gear early Friday morning and spent several more hours guided by the Indians locating other "sotanos". In all, we found over 15 pits which are at least 150 feet deep and had time to explore only two of the deepest. Three horizontal type caves were partially explored and numerous 15–20 foot deep pits checked. A very good showing for two and one half days of caving.

The pits and caves we explored were all situated within 1/2 mile from the house we stayed in and literally hundreds of other pits exist in the area that we did not get to. We arrived in Orizaba around 7:00 Friday evening.

Saturday, November 17th, we journeyed to Cordoba, Veracruz, to inquire about caves in that area and turned up nothing startling. Sunday, we went to Tesonapa, Veracruz, to visit a cave reported in PEMEX's "The Caves and Caverns of Mexico", a travel bulletin published by the PEMEX Travel Club. We managed to find an oil well, but no cave.

Monday, we left Orizaba for Valles, San Luis Potosi, and a couple of days at Xilitla to check out "El Sotano de Huitzmolotitla", otherwise known as "6 Second Sink". The pit is 100 feet in diameter and 350 feet deep—larger than any of the pits at Tequila, but not deeper, although the vertical potential in the vicinity of Xilitla is in excess of 5,000 feet. The maximum depth of Huitzmolotitla is probably around 2,000 feet. We arrived in the Xilitla area Tuesday and had to wait until Wednesday to rig the pit as we had to secure permission to enter from the Presidente de Xilitla. We were anxious to enter because we had heard about the pit from Bob Mitchell, who first reported it, and who rigged the 350 feet with a hand winch some years ago. This past Labor Day, Glen Merrill, Bill Cuddington, Buck Cuddy, and some other well-known spelunkers also rigged the 350-foot drop.

From accounts of these two trips, we also knew what we were up against before we there and the place to rig the drop. We also knew that at the bottom of the first 350 feet, a second drop of at least 125 feet existed which was unexplored. Having just rigged the pits of Tequila, we had our system down pat and worked together very smoothly. Again the 600 feet of NYLON was used. After bottoming the 350 feet, Raines and I drove a bolt at the second drop (160 feet), and re-tied the 600 feet to it, then rappelled on down.

This second drop is through a small waterfall. At the bottom, we were on one edge of a shallow pool looking down a fissure passage which we explored for over a mile. The passage was all walking and some climbing in a passage eight to ten feet wide and 30–100 feet high, with ankle to chest deep water. The passage showed no sign of ending when we turned back. I will say that the largest obstacle in exploring this passage is a flowstone block under which the water siphons. A cable ladder or handline of some kind would be necessary for some. We encountered no large drops in the mile of passage we explored. However, the

nearest resurgence is the Rio Huichihuayan, fed by large springs some 2,000 feet below. Plans are in the making for a return trip to start mapping and to continue exploration.

We entered the cave at 3:00 PM, around 30 minutes after we started rigging the first 350 drop. We reached the surface at 8:30 PM just six hours after we arrived at the pit and after exploring a mile of water passage and prussiking over 500 feet. We prussiked two at a time as we had done at the pits at Tequila, and thus saved some time that way. The system worked well, especially when no bad ledges are present and the 6,600 pound test NYLON will easily stand the strain of two people.

Returning to Valles Thursday morning, we proceeded immediately to Los Sabinos to continue mapping and exploring "El Sotano de la Arroya", which had been visited a year earlier by the UT Grotto for mapping and exploring. About 15 UTG members showed up this year and a virgin water passage was explored and another passage mapped 1,500 feet to its end. A few isopods were collected along with other specimens which will be identified sometime in the future.

In all, our trip was very successful. We accomplished what we went for--namely to see if the Tequila, Veracruz area would warrant an all-out assault for mapping, exploring, collecting, etc. Dr. F. Bonet of the University of Mexico (U.N.A.M.) has done work in the Xilitla area and as he says, "There is much more to be done, much more."

Finally, I would like to say the success of this trip is due largely to Professor Gabriel Mendoza, Senor Ermiliana Ixtmatlahua, and Senor Modesto Gomez, who helped us locate pits, secure permission to enter them, and gave us places to stay. Thanks also go to Bob Mitchell and Glen Merrill who gave us much information regarding the rigging difficulties of "Huitzmolotitla", which made our trip there so successful.

T.R.E.

from The Texas Caver, v. VII, no. 12, p. 135.

Mexican Cave Exploration 1962-1972 A Decade of Progress



William H. Russell

The first task of the newly organized Speleological Survey of Mexico (the original name of the AMCS) was to catalogue and assemble the information on Mexican caves that had been gathered by previous workers. A brief checklist of known caves was published on 6 February 1963, followed six days later by the SSM First Report on the Caves of Mexico, which listed information on 130 Mexican caves exclusive of Yucatán. About 110 of these were previously known caves and 20 were caves located by original field work prior to February 1963. The information on previously known caves came from three principal sources: Dr. Fredrico Bonet, author of numerous articles on Mexican caves; Dr. D.C. Carter, at that time with the Texas A&M College Department of Wildlife Management who had visited numerous Mexican caves in connection with his bat research; and Carroll Slemaker, who with the help of Dr. Bonet, had compiled a list of Mexican caves about 1956. These sources, combined with the several books on caves of the Yucatán Peninsula and other published references, gave a total of approximately 210 Mexican caves on which some information was available prior to 1962.

Ten years of field work has increased this number to over 750, with by far the largest gains in the northeastern states of Tamaulipas, Nuevo León, and San Luis Potosí. The over 500 caves located during the first 10 years fall into three general classes. First, the smaller but frequently interesting caves that would previously have been forgotten. These small caves are often of great biological interest and their accurate locations not only help the biologist but enable spelunkers to concentrate exploration on new caves. Second, and probably most numerous, are caves discovered in areas not previously investigated. They are, in general, located in areas of difficult access such as the Huautla, Oaxaca and La Cienega, Querétaro areas. The third group are caves with vertical entrances. Prior to the 1960's,

techniques for explorations of deep pits were poorly developed, and even in the areas most carefully investigated, the pits were generally left unentered. This is unfortunate, as for example, two pits in the Xilitla Region, Sótano de Tlamaya and Sotano de Huitzmolotitla, both lead to more horizontal passage than the combined length of all 15 of the pre-1962 caves known from the Xilitla Region. The simultaneous development of techniques for the exploration of vertical caves and the establishment of the AMCS was not a coincidence, since much of the improvement in vertical techniques was stimulated by the demands of the deep Mexican caves.

Most of the work of the AMCS has been concentrated in the Sierra Madre Oriental and adjacent ranges of northeastern Mexico. Few caves are known in the isolated mountain ranges north of Monterrey. Gruta de Carrizal, Gruta del Palmito, and Grutas de Villa de Garcia were previously known large caves that have been mapped. A detailed map is in preparation of Gruta del Palmito, and additional mapping is planned to add necessary cross sections and profiles to the Grutas de Villa de Garcia map. Cueva de Constantín, near Espinazo, N.L., was surveyed in 1971.

The Sierra Madre Oriental between Monterrey and Ciudad Victoria is likely to contain large cave systems but comparatively little work has been done in this difficult area. The most significant discoveries have been in the high altitude karst of the Puerto Redondo area south of Monterrey and the Gypsum karst between Galeana and Doctor Arroyo. Pozo de Gavilán, 325 feet deep, near Galeana, is probably the most spectacular gypsum sink known. Potentially very promising is the high area between Zaragoza, N.L. and Miquihuana to the west of Cd. Victoria.

The rainfall rapidly increases to the south of Cd. Victoria and caves become much more numerous. A large high limestone massif, the Sierra de Guatemala, just north of Gómez Farías, Tamps., contains numerous important caves. Among them are Sótano de Joya de Salas, over 1200 feet deep, and Cueva de Tres Manantiales, over a mile long. Numerous smaller caves are of great biological interest.

The Sierra de El Abra between Cd. Mante, Tamps., and Cd. Valles, SLP, is one of the most important cave regions of Mexico. Several large caves receive drainage from local arroyos, among them Sótano de Venadito, over 500 feet deep and a mile long, and Sótano de Japonés, over two miles long, Sótano de Yerbániz, Sótano de Matepalma, Sótano de Tigre, and the Sótano de Montecillos system are all over a mile long. Sótano del Arroyo, with Sótano de Tinaja and Cueva de Los Sabinos, forms an integrated system separated by short siphons. This system is the largest known in Mexico, with over 40,000 feet of passage. Higher in the range are several deep caves: Sótano del Soyate, with a lake 175 feet deep, 780 feet below the surface; Sótano de los Monos, a system 950 feet deep with a 464 foot entrance drop; and Hoya de Zimapán, with a large terminal room 1050 feet below the surface.

Just southwest of Cd. Valles are the spectacular pits of the Aquismón Region. Sótano de las Golondrinas is probably the most impressive vertical shaft in the world, with a 190 foot wide entrance opening onto a room 1000 feet long and 400 feet wide, over 1000 feet below the entrance. Nearly as impressive is Hoya de Guaguas, opening into two large rooms. Several large, relatively horizontal caves in this region have yet to be mapped. Just to the south of the Aquismón region are the well known caves of the Xilitla Region. Especially notable are the Sótano de Huitzmolotitla and the Sótano de Tlamaya, both deep pit systems

over a mile long. These were two of the first deep Mexican caves to be explored. To the south of Tamuzunchale are several promising areas yet to be investigated.

West of Cd. Valles, recent work has been concentrated in eastern Querétaro, northwest of Jalpan where El Sótano de Rancho el Barro, the world's deepest free fall pit is located, and the Sotanito de Ahuacatlán, with a 946 foot second drop, the deepest within any cave. During recent work in the La Cienega area and north of Pinal de Amoles, Sótano del Buque was explored to a depth of 1646 feet. Just west of Jalpan is the subterranean channel of the Río Jalpan. Two large caves are associated with this channel, the Cueva del Puente de Dios, where the river sinks and the Cueva del Río Jalpan, where the river emerges. North of the Jalpan Region lies another very promising zone, as yet unvisited, extending from Cd. Maiz south through Tamasopo. And further to the west, just east of San Luis Potosí, is a high karst area surrounding the Valle de los Fantasmos, with numerous deep pits, the deepest being Sótano de Los Lobos, with a free entrance drop of 620 feet. Sótano de San Francisco, just off the highway, takes drainage from a large area, with a water scoured shaft that drops 340 feet into a lake. The next drop has yet to be entered. To the south of San Francisco is Cueva de la Puente, with over a mile of stream passage.

Except for a few local areas, little original work has been attempted by the AMCS south of Mexico City. The large caves of the Cacahuamilpa area just south of Mexico City have been explored principally by the Grupo Espeleológico Mexicano, though the Gruta de Juxtlahuaca, with just over three miles of passage, now the second longest cave in Mexico, was mapped in 1971.

East of Mexico City much early work was accomplished in the Tequila area just south of Orizaba, with several pits in excess of 300 feet being located. High mountains containing great thicknesses of limestone trend south from Orizaba through the Tequila area and south into the state of Oaxaca. These mountains have been investigated only in small areas where access is relatively easy, notably near Huautla, Oax., where within two kilometers are two large complex pit systems: Sótano de San Agustín, reaching a depth of 2009 feet, the deepest in North America, and the Sótano de Río Iglesia, where a large river sinks, and which has been explored to a depth of 1755 feet. Cueva de San Agustín is on the ridge between the two. This area has attracted worldwide attention, and groups from several countries have visited the area, with the cavers from McMaster University in Canada making important contributions in both San Agustín and Río Iglesia, as well as in the surrounding areas. Large areas of limestone to the south of the city of Oaxaca have only been briefly visited, near Gruta de San Sebastian north of Sala de Vega.

In Chiapas work is still in a preliminary state, with many of the large, well-known caves such as Cueva de Rancho Nuevo near San Cristobal de las Casas and Cueva de Zapaluta, south of Comitán, only partly mapped. Cueva de el Chorreadero, 1097 feet deep, has been partially mapped by a group from McMaster University. Near Huistan a large river exits from Cueva de Mapachero, after flowing across the bottom of Chen-Sin-Vil-Mut, a 480 foot pit. The area of intense tropical karst in southern Tabasco has thus far received little attention, with only Gruta de Coconá being visited. The Yucatán peninsula is one of the richest cave areas of Mexico, and though much excellent work has been published on this area, vast numbers of caves remain hidden in the brush, unsurveyed and uncollected.

If the second ten years are as fruitful as the first, and they should be, as even the best known areas have large sections to be explored, and many of the most promising areas in

Mexico have yet to be visited, the second ten years should see an increasing number of caves and an even greater amount of knowledge as physical and biological data are accumulated. The first decade was one of discovery, the second should be one of consolidation, with the mapping of known caves and the investigation of all areas well underway.

Ten Years of Mexican Cave Biology



James R. Reddell

Dozens of blind fish caves, populations of ricinuleids which number in the thousands, troglolite millipeds so thick as to turn mud banks white, eyeless crickets mating on cave walls, blind scorpions, and transparent earthworms crawling about among blind planarians and isopods—a biospeleologist's wild fantasy? So it would have been ten years ago.

From the papers of Charles Breder on the blind fish of the Sierra de El Abra and of Federico Bonet, Candido Bolivar, and their associates on the general cave fauna of Mexico we had learned that the cave fauna was rich, but it hardly prepared us for the wonders we would find.

Mexico's present position as one of the most exciting areas in the world for the study of cave animals is a credit to the enthusiasm and willingness of many AMCS cavers to carry a collecting bottle in their pocket whenever they entered a cave. A trip into a new caving area in Mexico is bound to produce an entire new complex of undescribed genera and species. It is startling only when at least one spectacular discovery is not made for each serious venture into the high mountain karst of Mexico.

In 1962 there were approximately 750 species reported from all of Mexico. At the present time there are about 1300 species known. It is even more interesting to compare the totals exclusive of Yucatan. In addition to these figures many groups of animals which have been collected remain unstudied or the descriptions are unpublished. There is yet much to be done in Mexico but the last ten years of biological exploration have been sufficient to indicate the better known areas and the more interesting groups.

Collections have now been made in more than 300 caves in seventeen states. Most of the collecting efforts have been in the Sierra Madre Oriental, with lesser attention paid to karst areas of western Mexico, Guerrero, Oaxaca, Veracruz, and Chiapas. In the Sierra Madre Oriental most work has been concentrated in the Sierra de El Abra, Sierra de Guatemala, and Xilitla-Jalpan

Regions. The southern and northern limits of the mountains remain very poorly known. In western Mexico isolated mountain ranges have been examined in the states of Durango and Chihuahua, but many ranges have yet to be visited. Each will certainly prove to contain its own unique fauna. In southern Mexico collections have been limited to such isolated karst regions as the Tequila Region of Veracruz, the Huastla Region of Oaxaca, the Cacahuamilpa area of Guerrero, and numerous isolated and usually famous caves scattered throughout southern Mexico. It will be many years before this vast area will be covered sufficiently to even give us a good idea of the overall fauna.

The following briefly summarizes the accomplishments of the ten years in a few of the more important animal groups. It is intended by no means to be a complete listing of new or interesting species or to cover all of the animal groups known from the caves of Mexico. Appended to this account is a list of all of the species of animals described from animals collected by the AMCS and a bibliography of all papers published on material collected by the AMCS.

Tricladida. Prior to studies by the AMCS no freshwater triclad planarians had been definitely reported from Mexico. The flatworm fauna of Mexican caves still remains poorly known and doubtless many new species remain to be studied. The first troglobitic species of the genus *Dugesia* known in the world have been recently collected in caves in the Sierra de Guatemala and in Chiapas. Their descriptions are now in press. Mitchell and Kawakatsu have recently published the description of a new genus and species, *Dimarcus villalobosi*, representative of a new family (Dimarcusidae) of marine relict. This is the first flatworm associated with a cave habitat which can be considered a marine relict.

Oligochaeta. Only 12 species of macrodrile earthworm endemic to Mexico were known in 1962. Since then four new species have been described and a fifth undescribed species has been collected. Two species of the genus *Eodrilus*, a tropical group, have been found in caves in the Sierra de Guatemala and the Xilitla Region. These species are essentially transparent and may be the first troglobite earthworms known. A rare genus, *Trigaster*, is represented by two species in Sotano de Yerbaniz, San Luis Potosi.

Amphipoda. A new species of the genus *Mexiweckelia* has been collected in Cueva de la Siquita, Durango. This genus is known only from springs near Cuatrociénegas, Coahuila, and an artesian well at San Marcos, Texas. It is the second troglobitic amphipod known from Mexican caves.

Isopoda. The large AMCS collections of isopods remain largely unstudied, but one new species, *Cylindroniscus vallesensis* Schultz, has been described. This troglobite belongs to a genus previously known in Mexico from Yucatan and Nuevo Leon. In addition a new genus, *Mexiconiscus*, was described from AMCS material to receive an already described species from the Xilitla Region.

Decapoda. Four species of crayfish of the genus *Procambarus* were previously known from Mexican caves. A fifth species, *P. villalobosi* Hobbs, was described from Cueva del Agua, San Luis Potosi. No blind shrimp had been reported from outside of Yucatan until the discovery of a new species in Sotano de la Tinaja, San Luis Potosi. It is a member of the Cuban genus, *Troglocubanus*, and is being described by Alejandro Villalobos.

Scorpionida. Perhaps the single most amazing discovery made in Mexico has been that of blind scorpions. Prior to their discovery no completely eyeless scorpion was known. In 1968 Robert W. Mitchell described *Typhlochactas rhodesi*, a new genus and species from Cueva de la Mina, Tamaulipas, and *T. reddelli*, from Cueva del Ojo de Agua de Tlilapan, Veracruz. They were sufficiently distinct to form the basis of a new subfamily, the Typhlochactinae. A third species, even

more highly adapted for cave existence, *T. elliotti*, has been described from Sotano de Yerbaniz, San Luis Potosi.

Chelonethida. Two rare families, the Hyidae and the Vachoniidae, were first described on the basis of species from Mexican caves. An additional troglobitic species of the Vachoniidae (*Paravachonium superbum* Muchmore) has been collected in Sotano de Gomez Farias, Tamaulipas, while two species of the Hyidae have been described. *Leucohya magnifica* Muchmore was found in Cueva del Carrizal, Nuevo Leon, while a new genus and species, *Mexobisium garadoxum* Muchmore, was found in Cueva del Ojo del Agua de Tlilapan, Veracruz. *Tyrannochthonius troglobius* Muchmore, a troglobite, was described from Cueva de la Capilla, Tamaulipas. This is the first record of this genus in Mexico. Eyed species, all undescribed, are known from several caves in Mexico. The genus *Pachychitra* was previously represented in Mexico by two Yucatan cave species. One species (*P. grandis*) has been described from a cave in Chiapas and a second (*P. similis*) from a cave in Tamaulipas. Three species of the rare genus, *Aphrastochthonius*, are known from Mexican caves. This genus, previously known only from Alabama caves, is now recorded from three caves in Mexico. *A. parvus* Muchmore was described from Cueva de la Florida, Tamaulipas, *A. russelli* Muchmore from Cueva Pinta, San Luis Potosi, and a new species from Cueva de la Capilla, Tamaulipas.

Schizomida. The order Schizomida was presumed to be comparatively rare in Mexico prior to 1962. Two species, one from Yucatan caves and an epigen species in Tamaulipas, had been described. At the present time, five species of *Schizomus* have been described from caves in San Luis Potosi, Tamaulipas, and Chiapas. Many additional species await description. In addition, the largest known schizomid, *Agastoschizomus lucifer* Rowland, a new genus and species of probable troglobite, is known from caves in the Sierra De El Abra, San Luis Potosi.

Araneae. Since about 70 species of spider have been described from caves in Mexico. Although most of these are troglaphiles at least ten additional species of troglobite have been added to the two previously known. Two of these are of particular interest in being among the four or five known troglobites in the suborder Mygalomorphae, a group which includes the tarantulas. Both species are the first troglobites in their respective genera. *Aphonopelma stygia* Gertsch is known only from Cueva de los Potrerillos, San Luis Potosi, while *Euagrus cavernicola* Gertsch is known from caves in the Sierra de Guatemala, Tamaulipas.

Two species of the genus *Neoleptoneta*, *N. isolata* Gertsch from Grutas de Garcia, N.L., and *N. capilla* Gertsch from Cueva de la Capilla, Tamps., are the first troglobitic members of the family Leptonetidae known from Mexico. In addition several troglaphile species have been described from Mexican caves. Two species of agelenid spiedess of the genus *Cicurina*, *C. mina* Gertsch and *C. coahuila* Gertsch are unquestioned troglobites. The first is known from caves in the Sierra de Guatemala, Tamps., and the second from Cueva de los Lagos, Coahuila. Additional species of *Cicurina* and several of the genus *Tegenaria* are important troglaphiles in Mexican caves.

The most important group inhabiting caves in Mexico are the pholcids. More than 40 species, most newly described, are known from caves throughout Mexico. Of these four species of troglobite have been described based on AMCS collections: *Pholcophora gruta* Gertsch, from Grutas de Juxtlahuaca, Guerrero; *Metagonia tlamaya* Gertsch from Sotano de Tlamaya, S.L.P.; *M. pura* Gertsch from Cueva de la Capilla, Tamps.; and *M. atoyacae* Gertsch from Grutas de Atoyac, Ver.

It is not possible to summarize the remaining groups of spiders known from caves except to mention that many new species have been found in several families, notably the Ctenidae, the Symphytognathidae, the Nesticidae, and the Scytodidae.

Ricinulei. The ricinuleids have been considered to be the rarest order of living arthropods. The discovery of a single specimen has been cited as "a zoological triumph," "an event." Huge populations have been collected by AMCS members in Sotano del Tegré, Cueva de Taninul n.1, and Cueva de la Florida. These belong to two species previously described, *Cryptocellus pelaeze*, and *C. osorioi*. In addition three new species have been described by Gertsch. *Cryptocellus bolivari* is known from two caves in Chiapas. *C. mitchelli* in Cueva del Guano, Durango, and *C. reddelli* in Cueva de los Riscos, Durango. The latter species is of interest in being the first unquestionable troglobite ricinuleid known.

Opilionida. Goodnight and Goodnight have recently described eight new species of opilionids from caves in Mexico. The most interesting species is the most highly cave-adapted opilionid known from Mexico, *Hoplobunus inops*, from the Sierra de Guatemala, Tamps. Other species include the bizarre, *H. robustus*, from caves in Veracruz, and *Pellobusum mexicanus*, from Grutas del Palmito, Nuevo Leon. The latter species is the first record of the genus in Mexico. Many opilionids await descriptions.

Acarina. Most of the extensive AMCS mite collections await study, but two species have been identified in the family Rhahidiidae. This family was previously not recorded from Mexico. One of the two species, *Rhagidia trisetatus* Elliott and Strandtmann, was undescribed.

Diplopoda. The millipeds of Mexican caves constitute one of the most important elements of the fauna. It is perhaps as representative of Mexican caves as is the beetle fauna of caves in the eastern United States. Dozens of undescribed species in many new genera await description and the described part of the fauna is only a small sampling of the material awaiting description. Only the more important described species are mentioned here.

The Order Glomerida was previously represented in Mexico by one epigean species. Two troglobites, *Glomeroides caecus* Causey from the Xilitla Region, and *G. promiscus* from the Sierra de Guatemala, have been described.

The Order Chordeumida is represented in Mexican caves by two families with troglobites. Several undescribed species of the family Cleidogonidae are known. The family Trichopealadae is unknown from epigean localities in Mexico. It was first reported from Mexico by Causey when she described a new genus and species, *Mexiterpes sabinus*, from Sotano del Arroyo, S.L.P. This species is now known from several additional caves in the Sierra de El Abra. A second genus, *Poterpes*, with two species is now known from caves in Mexico. *P. egeo* was described from Cueva de El Puente, S.L.P., while *P. fishi* is known from Cueva de la Luz, S.L.P. The presence of this family, a common cave inhabitant of caves in the Eastern U.S., in Mexican caves, is of great interest.

The Order Polydesmida is the most important contributor to the cave fauna of Mexico. When the fauna is fully described several hundred species will probably be recorded from caves, many of them troglobites. The family Polydesmidae is represented by many undescribed species and several probable new genera. Almost every major cave area contains populations of this small white millipede. This is a complex group and it will probably be several years before they are well known. The family Rhachodesmidae contributes the most spectacular troglobites known in Mexico. These large, delicate white millipeds are a beautiful sight in Mexican caves and in some are present in such vast numbers as to give mud banks a white appearance. Few of the many species are described, but Causey has recently described three. *Strongylodesmus harrisoni* is an ever-present element of the fauna of the caves of the Sierra de Guatemala. Two species, *Unculabes crispus* from the Tlamaya caves, and *U. versatilis* from Cueva de Potrerillos, are known

from the Xilitla Region. Additional species are known from caves in the Jalpan Region, in the Sierra de Guatemala, in Oaxaca, and in Guerrero. Troglobite or troglophile members of the genus *Sphaeriodesmus* have been found in many caves throughout Mexico. The most important troglophile group in Mexican caves are the small millipeds of the family Stylodesmidae. Although one possible troglobite is known most are normally pigmented. Many species and several genera await description.

The Order Spirostreptida is represented by one troglobite genus, *Mexicambala*. The family Cambalidae is unknown from the surface in Mexico. It is otherwise represented in caves in Texas, New Mexico, and by surface populations in the more eastern United States and high mountain regions of the U.S. Four troglobitic species have been described from Mexican caves. *Mexicambala russelli* is known from caves in the Xilitla Region, *M. fishi* from caves in the Huatla Region of Oaxaca, and *M. blandus* and *M. inopis* from caves in the Sierra de Guatemala.

Thysanura. Many species of troglobitic micoletioid thysanuran are known from caves in Mexico, but none have been described. They probably belong in at least one undescribed genus.

Collembola. Several species of troglobitic springtails remain to be described. At least two blind species of the genus *Pseudosinella* await description.

Saltatoria. The cricket fauna of Mexican caves is particularly rich. Two families contain species of importance: the Gryllidae and the Rhaphidophoridae. The gryllids include two general of particular interest: *Paracophus* and *Ampniacusta*. *Paracophus* has recently been revised by T. H. Hubble and includes five troglophile and three troglobite species. *P. caecus* is the first completely eyeless gryllid in the New World. It is an abundant species in the Sierra de Guatemala. *P. cladonotus* possesses rudimentary eyes and is found in the Xilitla Region. Another rudimentary eyed species, *P. lippus*, is known only from Cueva de la Lagunita, S. L. P. Troglophile species occur throughout the Sierra Madre Oriental from Hidalgo north to Nuevo Leon and Coahuila. The genus *Ampniacusta* is presently being revised by T. H. Hubbell. Many new species are being described from Chiapas north into Tamaulipas. This genus is a particularly important troglophile or troglaxene in the caves of southern Mexico, but is largely replaced in northern Mexico by *Paracophus*.

The comael crickets of the family Rhaphidophoridae are represented in Mexican caves by many undescribed species in several genera. Hubbell has recently described three genera, *Exochodrilus* with two species from the Sierra de Guatemala; *Anargyrtes* with two species in Guerrero and Mexico; and *Leptargyrtes* with two species in the Jalpan Region of Queretaro. Many additional species in several genera await description.

Coleoptera—Carabidae. The beetle fauna, so important an element of the cave fauna of the United States, is comparatively poor in Mexico. The only troglobites occur at high elevations and are quite rare. Nevertheless species of considerable interest are known. The most unique element of the fauna is *Antroforceps bolivari* Barr, known only by a single specimen from Sotano de la Joya de Salas, Tamps. This is one of only a few troglobitic scaritine beetles in the world and is most closely related to genera in South America. The tribe Trechini, the most prevalent element of the cave fauna of the eastern United States, is represented in Mexico by five described high altitude troglobite species. One, *Paratrechus (Hygroduvalius) pallescens* Barr, is known from caves in Queretaro, and is closely related to species from high mountains in southern Mexico. The troglobitic genus, *Mexaphaenops*, is known by four described species, three found by AMCS members. *M. fishi* has been taken in caves in Valle de los Fantasmos, S.L.P., *M. elegans* in caves in Queretaro, and *M. intermedius* from caves in the Sierra de Guatemala, Tamps. The genus

Mexisphodrus, contains two described and two or three undescribed troglobitic species. *M. profundus* is known from caves in the Sierra de Guatemala while *M. veraecrucis* is known from caves in the Tequila Region of Veracruz. Both are large beetles and frequently abundant. In addition to the troglobites many species of troglophile inhabit caves and some will doubtless prove to be of interest.

Coleoptera—Catopidae. Two troglobitic catopid beetles are known from Mexico. *Ptomaphagus troglomexicanus* Peck, is known from caves in the Sierra de Guatemala, Tamaulipas. An undescribed species of *Ptomaphagus* has been collected in a single cave in Nuevo Leon. Several species of *Ptomaphagus* are important elements of the troglophile fauna. One, *P. elabra* Peck, is present in almost every cave in the Sierra de El Abra, where it is usually found in association with vampire bat guano.

Coleoptera—Ptinidae. The uncommonly collected beetle family Ptinidae, the spider beetles, has been collected in several caves. *Niptus abstrusus* Spilman, described from Fern Cave, Texas is known from several caves in Coahuila and Durango. A species with reduced eyes, *N. absconditus* Spilman, was described from Grutas de Xoxafi, Hidalgo.

Coleoptera—Staphylinidae. Staphylinids make up one of the most important elements of the beetle fauna of Mexican caves, but none can be considered to be troglobitic. A strikingly distinct new genus and species, *Stenopholea reddelli* Herman, was described from Cueva de la Mina, Tamaulipas and thought to be troglobitic. Extensive collection of forest leaf litter, however, has revealed it to be present in this endogean habitat. The species, *Stilicolina condei* Jarriage, described from a Texas cave, has been found present in caves as far south as San Luis Potosi.

Telostei. Prior to investigations by the AMCS the blind cave fish of the genus *Astyanax* were known only from five caves in the Sierra de El Abra. Intensive explorations in the Sierra de El Abra and Sierra de Guatemala have resulted in the discovery of more than 20 populations ranging from the Rio Tampaon north of Gomez Farias. These collections are being studied intensively by Dr. Robert W. Mitchell of Texas Tech University and will form the basis of one of the most comprehensive studies of cave animal evolution ever done.

This has been a very hasty examination of the biological accomplishments of the Association for Mexican Cave Studies. In addition to the discovery of the many new species of troglobite listed there were many important new troglophiles and troglloxenes. Also of great importance has been the discovery of numerous populations of many species, extending the range of known species, and thus laying the basis for a worthwhile analysis of the zoogeography of many groups of cave animals. In fact, this particular aspect of the studies of the AMCS is one of the most significant. It is easy to collect animals in one or two caves and quickly publish the isolated results done by some other groups collecting in Mexico, but to collect in almost every cave in a region as has been done in the Sierra de El Abra and Sierra de Guatemala is to lay the basis for meaningful zoogeographic studies, for analysis of interspecies variation, and for comprehensive evolutionary studies.

SPECIES DESCRIBED FROM THE COLLECTIONS OF THE AMCS

The following list of species includes all of those described at least in part on collections made by the Association for Mexican Cave Studies. Also included is the type locality for each species. An asterisk (*) indicates the genus was also new, while a dagger (†) designates a probable troglobite.

TURBELLARIA—TRICLADIDA

Family Dimarcusidae

†**Dimarcus villalobosi* Mitchell and Kawakatsu 1972 — Grutas de Cocona, Tabasco

CLITELLATA—OLIGOCHAETA

Family Acanthodrilidae

Eodrilus albus Gates 1970 — Cueva de la Capilla, Tamaulipas

E. mexicanus Gates 1968 — Sotano de la Tlamaya, San Luis Potosi

Family Octochaetidae

Trigaster reddelli Gates 1971 — Sotano de Yerbaniz, San Luis Potosi

T. vallesensis Gates 1971 — Sotano de Yerbaniz, San Luis Potosi

CRUSTACEA—PODOCOPA

Family Entocytheridae

Ankylocythere tolteca Hobbs 1971 — Cueva del Agua, San Luis Potosi

CRUSTACEA—ISOPODA

Family Trichoniscidae

†*Cylindroniscus vallesensis* Schultz 1970 — Cueva Pinta, San Luis Potosi

†**Mexiconiscus* Schultz 1964

CRUSTACEA—DECAPODA

Family Astacidae

Procambarus villalobosi Hobbs 1967 — Cueva del Agua, San Luis Potosi

ARACHNIDA—SCORPIONIDA

Family Chactidae

†*Typhlochactas elliotti* Mitchell 1971 — Sotano de Yerbaniz, San Luis Potosi

†*T. reddelli* Mitchell 1968 — Cueva del Ojo de Agua de Tlilapan, Veracruz

†**T. rhodesi* Mitchell 1968 — Cueva de la Mina, Tamaulipas

Family Vejovidae

Vejovis gracilis Gertsch and Soleglad 1972 — Grutas de Atoyac, Veracruz

ARACHNIDA—CHELONETHIDA

Family Chthoniidae

†*Aphrastochthonius parvus* Muchmore 1972 — Cueva de la Florida, Tamaulipas

†*A. russelli* Muchmore 1972 — Cueva Pinta, San Luis Potosi

†*Tyrannochthonius troglobius* Muchmore 1969 — Cueva de la Mina, Tamaulipas

Family Hyidae

†*Leucohya magnifica* Muchmore 1972 — Cueva del Carrizal, Nuevo Leon

†**Mexobisium paradoxum* Muchmore 1972 — Cueva del Ojo de Agua de Tlilapan, Veracruz

Family Syarinidae

Pachychitra grandis Muchmore 1972 — Cueva del Tio Ticho, Chiapas

P. similis Muchmore 1972 — Cueva de los Vampiros, Tamaulipas

Family Vachoniidae

†*Paravachonium superbum* Muchmore 1972 — Sotano de Gomez Farias, Tamaulipas

ARACHNIDA—SCHIZOMIDA

Family Schizomidae

- †**Agastoschizomus lucifer* Rowland 1971 — Sotano de la Tinaja, San Luis Potosi
- Schizomus cookei* Rowland 1971 — Sotano de la Tinaja, San Luis Potosi
- Schizomus longimanus* Rowland 1971 — Cueva Cerro Hueco, Chiapas
- S. mexicanus* Rowland 1971 — Sotano de la Tinaja, San Luis Potosi
- S. mitchelli* Rowland 1971 — Cueva de El Pachon, Tamaulipas
- S. reddelli* Rowland 1971 — Cueva de Tres Manantiales, Tamaulipas

ARACHNIDA—ARANEAE

Family Dipluridae

- †*Euagrus cavernicola* Gertsch 1971 — Cueva de la Capilla, Tamaulipas

Family Theraphosidae

- †*Aphonopelma stygia* Gertsch 1971 — Cueva de los Potrerillos, San Luis Potosi

Family Agelenidae

- †*Cicurina coahuila* Gertsch 1971 — Cueva de los Lagos, Coahuila
- C. iviei* Gertsch 1971 — Harrison Sinkhole, Tamaulipas
- †*C. mina* Gertsch 1971 — Cueva de la Capilla, Tamaulipas
- Tegenaria blanda* Gertsch 1971 — Cueva de la Capilla, Tamaulipas
- T. caverna* Gertsch 1971 — Cueva del Puerto del Leon, Queretaro
- T. decora* Gertsch 1971 — Cueva de los Potrerillos, San Luis Potosi
- T. gertschi* Roth 1968 —
- T. mexicana* Roth 1968 —
- T. rothi* Gertsch 1971 — Cueva de El Ocote, Hidalgo
- T. selva* Roth 1968 — Cueva de la Selva, San Luis Potosi

Family Ctenidae

- Ctenus mitchelli* Gertsch 1971 — Cueva de la Mina, Tamaulipas

Family Leptonetidae

- †**Neoleptoneta capilla* (Gertsch 1971) — Cueva de la Capilla, Tamaulipas
- †*N. delicata* (Gertsch 1971) — Iron Mine 2 km E Pinal de Amoles, Queretaro
- †*N. isolata* (Gertsch 1971) — Grutas de Garcia, Nuevo Leon
- N. pecki* (Gertsch 1971) — Grutas de San Bartolo, Nuevo Leon
- N. rainesi* (Gertsch 1971) — Cueva de El Pachon, Tamaulipas
- N. reclusa* (Gertsch 1971) — Cueva de Chorros de Agua, Nuevo Leon

Family Nesticidae

- Gaucelmus calidus* Gertsch 1971 — Grutas de Zapaluta, Chiapas
- Nesticus hoffmanni* Gertsch 1971 — Cueva de El Ocote, Hidalgo
- N. nahuanus* Gertsch 1971 — Cueva de la Boca, Nuevo Leon
- N. vasquezae* Gertsch 1971 — Sotano del Gobernador, Queretaro

Family Pholcidae

- Coryssocnemis abernathyi* Gertsch 1971 — Sotano de Abernathy, San Luis Potosi
- C. clarus* Gertsch 1971 — Cueva del Nacimiento del Rio Frio, Tamaulipas
- C. facetus* Gertsch 1971 — Cueva Chica del Camino, Chiapas
- C. iviei* Gertsch 1971 — Cueva de El Ocote, Hidalgo
- C. pecki* Gertsch 1971 — Cueva de Arcotete, Chiapas
- C. placidus* Gertsch 1971 — Cueva de Agua de Tilapan, Veracruz
- Metagonia amica* Gertsch 1971 — Cueva de El Jobo, San Luis Potosi
- †*M. atoyacae* Gertsch 1971 — Grutas de Atoyac, Veracruz
- M. candela* Gertsch 1971 — Cueva del Carrizal, Nuevo Leon
- M. capilla* Gertsch 1971 — Cueva de la Capilla, Tamaulipas
- M. coahuila* Gertsch 1971 — Cueva de Cuevacillas, Coahuila
- M. mcnnatti* Gertsch 1971 — Cueva de las Pinos Ramas, Chiapas
- M. pachona* Gertsch 1971 — Cueva de El Pachon, Tamaulipas

- M. placida* Gertsch 1971 – Cueva de la Boca, Nuevo Leon
M. punctata Gertsch 1971 – Cueva de Carnicerías, San Luis Potosí
 †*M. pura* Gertsch 1971 – Cueva de la Capilla, Tamaulipas
M. secreta Gertsch 1971 – Cueva del Nacimiento del Río Frio, Tamaulipas
M. serena Gertsch 1971 – Grutas de García, Nuevo Leon
M. tinaja Gertsch 1971 – Sotano de la Tinaja, San Luis Potosí
 †*M. tlamaya* Gertsch 1971 – Sotano de Tlamaya, San Luis Potosí
Modisimus boneti Gertsch 1971 – Cueva Chica, San Luis Potosí
M. mckenziei Gertsch 1971 – Sotano del Leon, Tamaulipas
M. mitchelli Gertsch 1971 – Cueva de la Capilla, Tamaulipas
M. rainesi Gertsch 1971 – Cueva de la Boca, Nuevo Leon
Modisimus reddelli Gertsch 1971 – Cueva Bonita, Tamaulipas
Pholcophora bispinosa Gertsch 1971 – Cueva de Arcotete, Chiapas
P. elliotti Gertsch 1971 – Sotano de las Piedras, San Luis Potosí
P. evansi Gertsch 1971 – Grutas de Zapaluta, Chiapas
P. exigua Gertsch 1971 – Cueva de los Riscos, Durango
 †*P. gruta* Gertsch 1971 – Grutas de Juxtlahuaca, Guerrero
P. mitchelli Gertsch 1971 – Cueva de la Virgen de Guadalupe, Tamaulipas
P. troglodyta Gertsch 1971 – Grutas de Atoyac, Veracruz
Physocylus bicornis Gertsch 1971 – Grutas de Juxtlahuaca, Guerrero
P. merus Gertsch 1971 – Sumidero de Matehuala, San Luis Potosí
P. pedregosus Gertsch 1971 – Pedregoso Circle Cave, Coahuila
P. reddelli Gertsch 1971 – Grutas de Xoxafi, Hidalgo
Psilochorus diablo Gertsch 1971 – Cueva del Diablo, Chihuahua
P. fishi Gertsch 1971 – Grutas de Xoxafi, Hidalgo
P. russelli Gertsch 1971 – Cueva del Pedregoso, Coahuila
 Family Symphytognathidae
Maymena cascada Gertsch 1971 – Cueva de la Cascada, Veracruz
M. delicata Gertsch 1971 – Cueva de Ojo de Agua Grande, Veracruz
M. grisea Gertsch 1971 – Cueva de la Capilla, Tamaulipas

ARACHNIDA–RICINULEI

Family Ricimoididae

- Cryptocellus bolivari* Gertsch 1971 – Sumidero del Camino, Chiapas
C. mitchelli Gertsch 1971 – Cueva del Guano, Durango
 †*C. reddelli* Gertsch 1971 – Cueva de los Riscos, Durango

ARACHNIDA–OPILIONIDA

Family Phalangodidae

- †*Hoplobunus inops* Goodnight and Goodnight 1971 – Sotano de la Joya de Salas, Tamaulipas
H. robustus Goodnight and Goodnight 1971 – Cueva de la Cascada, Veracruz
Karos depressus Goodnight and Goodnight 1971 – Cueva de Llano de Conejo, San Luis Potosí
K. graciosus Goodnight and Goodnight 1971 – Cueva de Poca Ventana, San Luis Potosí
K. parvus Goodnight and Goodnight 1971 – Cueva de El Pachon, Tamaulipas
K. projectus Goodnight and Goodnight 1971 – Cueva de Poca Ventana, San Luis Potosí
K. rugosus Goodnight and Goodnight 1971 – Cueva de Ojo de Agua de Tlilapan, Veracruz
Pellobunus mexicanus Goodnight and Goodnight 1971 – Grutas del Palmito, Nuevo Leon

ARACHNIDA–ACARINA

Family Rhagidiidae

- Rhagidia trisetatus* Elliott and Strandtmann 1971 – Sotano de la Tinaja, San Luis Potosí

DIPLOPODA—GLOMERIDA

Family Glomeridae

- †*Glomeroides caecus* Causey 1964 – Sotano de Huitzmolotitla, San Luis Potosi
 †*G. promiscus* Causey 1964 – Sotano de Gomez Farias, Tamaulipas

DIPLOPODA—CHORDEUMIDA

Family Trichopetalidae

- †**Mexiterpes sabinus* Causey 1963 – Sotano del Arroyo, San Luis Potosi
 †**Poterpes egeo* Causey 1969 – Cueva de El Puente, San Luis Potosi
 †*P. fishi* Causey 1969 – Cueva de la Luz, San Luis Potosi

DIPLOPODA—POLYDESMIDA

Family Oniscodesmidae

- †*Bonetesmus novenus* Causey 1971 – Cueva del Ojo de Agua Grande, Veracruz

Family Rhachodesmidae

- †*Strongylodesmus harrisoni* Causey 1971 – Cueva del Rancho del Cielo n. 7, Tamaulipas
 †**Unculabes crispus* Causey 1971 – Sotano de Huitzmolotitla, San Luis Potosi
 †*U. versatilis* Causey 1971 – Cueva de Potrerillos, San Luis Potosi

Family Stylodesmidae

- Bolivaresmus monasticus* Causey 1971 – Cueva de Llanura, San Luis Potosi
**Gibberdesmus egenus* Causey 1971 – Cueva de la Mina, Tamaulipas
G. gelidus Causey 1971 – Cueva del Nacimiento del Rio Frio, Tamaulipas
**Stenotodesmus amarus* Causey 1971 – Sotano de Tlamaya, San Luis Potosi
Yucodesmus hoctunanus Causey 1971 – Hoctun Cave, Yucatan

DIPLOPODA—SPIROSTREPTIDA

Family Cambalidae

- †*Mexicambala blandus* Causey 1971 – Harrison Sinkhole, Tamaulipas
 †*M. fishi* Causey 1971 – Cueva Arriba del Rio Iglesia, Oaxaca
 †*M. inopis* Causey 1971 – Sotano de la Joya de Salas, Tamaulipas
 †**M. russelli* Causey 1964 – Cueva de la Porra, San Luis Potosi

INSECTA—BLATTARIA

Family Blattellidae

- Nesomytlacris reddelli* Fisk and Gurney 1972 – Cueva de El Pachon, Tamaulipas

INSECTA—SALTATORIA

Family Gryllidae

- †*Paracophus caecus* Hubbell 1972 – Sotano de la Joya de Salas, Tamaulipas
 †*P. cladonotus* Hubbell 1972 – Sotano de Tlamaya, San Luis Potosi
 †*P. lippus* Hubbell 1972 – Cueva de la Lagunita, San Luis Potosi
P. placonotus Hubbell 1972 – Cueva de la Hoya, San Luis Potosi
P. reddelli Hubbell 1972 – Bee Cave, Tamaulipas
P. sanctorum Hubbell 1972 – Cueva de la Virgen, Tamaulipas

Family Rhaphidophoridae

- *Anargyrtes* Hubbell 1972
Exochodrilus caelestis Hubbell 1972 – Dry Cave, Tamaulipas
**E. forcipatus* Hubbell 1972 – Cueva de la Mina, Tamaulipas
Leptargyrtes boneti Hubbell 1972 – Sotano de Camposantos, Queretaro
**L. tejamanilae* Hubbell 1972 – Cueva del Puerto del Leon, Queretaro

INSECTA—COLEOPTERA

Family Carabidae

- †**Antroforceps bolivari* Barr 1967 — Sotano de la Joya de Salas, Tamaulipas
- †*Mexaphaenops elegans* Barr 1967 — Sotano de Tejamanil, Queretaro
- †*M. fishi* Barr 1967 — Cave at Valle de los Fantasma, Queretaro
- †*M. intermedius* Barr 1971 — Cueva de la Capilla, Tamaulipas
- †*Mexisphodrus profundus* Barr 1966 — Sotano de la Joya de Salas, Tamaulipas
- M. tlamayaensis* Barr 1966 — Sotano de Tlamaya, San Luis Potosi
- †**M. veraecrucis* Barr 1965 — Sotano del Profesor, Veracruz
- †*Paratrechus (Hygroduvalius) pallescens* Barr 1967 — Sotano de Tejamanil, Queretaro

Family Leiodidae

- Ptomaphagus elabra* Peck 1971 — Cueva de El Pachon, Tamaulipas
- †*P. (Adelops) troglomexicanus* Peck 1968 — Cueva de la Capilla, Tamaulipas

Family Ptinidae

- Niptus absconditus* Spilman 1968 — Grutas de Xoxafi, Hidalgo

Family Staphylinidae

- **Stenopholea reddelli* Herman 1969 — Cueva de la Mina, Tamaulipas

AMPHIBIA—ANURA

Family Leptodactylidae

- Syrrophus dennisi* Lynch 1970 — Cueva de El Pachon, Tamaulipas

PUBLICATIONS BASED ON COLLECTIONS BY THE AMCS

- Barr, T.C., Jr. 1965. "A new cavemicolous sphodrine from Veracruz, Mexico." *Coleopterists' Bull.*, 19:65-72.
- . 1966. "New species of *Mexisphodrus* from Mexican caves (Coleoptera: Carabidae)." *Psyche*, 73(2):112-115.
- . 1967. "*Antroforceps*, an eyeless cave scaritine from Mexico (Coleoptera: Carabidae)." *Coleopterists' Bull.*, 21(3):65-70.
- . 1967a. "Three new cave trechines from Mexico (Coleopt., Carab.)." *Ciencia*, 25(5):161-166.
- . 1971. "A new species of *Mexaphaenops* from Tamaulipas, Mexico (Coleoptera: Carabidae)." *Assoc. Mex. Cave Stud. Bull.*, 4:113-116.
- , C. Bolivar Pieltain, and Jorge Hendrichs. 1968. "Nota sinonimica sobre *Agonum (Platynus) bilimeki* Bolivar y Hendrichs." *Ciencia*, 26(3):107-108.
- Bowman, T.E. 1964. "*Antrolana lira*, a new genus and species of troglobitic cirolanid isopod from Madison Cave, Virginia." *Internatl. J. Speleol.*, 1(1-2):229-236, pl. 50-57.
- . 1965. "*Xilitoniscus*, a new genus for the Mexican troglobitic isopod, *Cordioniscus laevis* Rioja (Oniscoidea: Trichoniscidae)." *Proc. Biol. Soc. Washington*, 78:209-216.
- Causey, N.B. 1963. "*Mexiterpes sabinus*, new genus and new species, a Mexican troglobite (Diplopoda: Trichopetalidae)." *Psyche*, 70(4):235-239.
- . 1964. "New cavernicolous millipeds of the family Cambalidae from Texas and Mexico." *Internatl. J. Speleol.*, 1(1-2):237-246, pl. 58-59.
- . 1964a. "Two new troglobitic millipeds of the genus *Glomeroides* from Mexico (Glomeridae: Glomerida)." *Proc. Louisiana Acad. Sci.*, 27:63-66.
- . 1969. "New trichopetalid (Chordeumidea: Chordeumida) millipedes from caves in North and Central America." *Proc. Louisiana Acad. Sci.*, 32:43-49.
- . 1971. "The Cambalidae in Mexican caves, with descriptions of three new species of *Mexicambala* (Diplopoda: Cambalida)." *Proc. Biol. Soc. Washington*, 84:271-282.
- . 1971a. "Millipedes in the collection of the Association for Mexican Cave Studies (Diplopoda)." *Assoc. Mex. Cave Stud., Bull.*, 4:23-32.

- Fisk, F.W., and A.B. Gurney. 1972. "Synopsis of the neotropical cockroaches of the genus *Nesomylacris* (Dictyoptera: Blattaria: Blattellidae)." *Proc. Entomol. Soc. Washington*, 74(2):196-206.
- Gates, G.E. 1968. "On a new species of earthworm from a Mexican cave." *Internatl. J. Speleol.*, 3:63-70.
- . 1970. "On a new species of earthworm from another Mexican cave." *Southwestern Nat.*, 15(2):267-269.
- . 1971. "On some earthworms from Mexican caves." *Bull. Assoc. Mex. Cave Stud.*, 4:3-8.
- Gertsch, W.J. 1971. "A report on some Mexican cave spiders." *Bull. Assoc. Mex. Cave Stud.*, 4:47-111.
- . 1971a. "Three new ricinuleids from Mexican caves (Arachnida, Ricinulei)." *Bull. Assoc. Mex. Cave Stud.*, 4:127-135.
- , and Michael Soleglad. 1972. "Studies of North American scorpions of the genera *Uroctonus* and *Vejois* (Scorpionida, Vejovidae)." *Bull. Amer. Mus. Nat. Hist.*, 148(4):547-608.
- Goodnight, C.J., and M.L. Goodnight. 1971. "Opiliones (Phalangida) of the family Phalangodidae from Mexican caves." *Bull. Assoc. Mex. Cave Stud.*, 4:33-45.
- Herman, L.J., Jr. 1969. "A troglotic staphylinid from Mexico (Coleoptera, Staphylinidae, Paederinae)." *Amer. Mus. Nov.*, 2367. 9 pp.
- . 1970. "The ecology, phylogeny, and taxonomy of *Stilicolina* (Coleoptera, Staphylinidae, Paederinae)." *Amer. Mus. Nov.*, 2412. 26 pp.
- Hobbs, H.H., Jr. 1967. "*Procambarus villalobosi*, un nuevo cambarino de San Luis Potosi, Mexico (Decapoda, Astacidae)." *Anal. Inst. Biol., Mex.*, 38(1):41-46.
- . 1971. "The entocytherid ostracods of Mexico and Cuba." *Smithsonian Contr. Zool.*, 81. 55 pp.
- Hubbell, T.H. 1972. "Records of cave Orthoptera from northeastern and central Mexico, with a revision of the gryllid genus *Paracophus* and descriptions of three new genera of Rhaphidophoridae." *Accademia Nazionale dei Lincei, Problemi Attuali di Scienza e di Cultura*, 171:47-115, pl. I.
- Lynch, J.D. 1967. "Synonymy, distribution and variation in *Eleutherodactylus decoratus* of Mexico (Amphibia: Leptodactylidae)." *Trans. Illinois State Acad. Sci.*, 60(3):299-304.
- . 1970. "Taxonomic notes on some Mexican frogs (*Eleutherodactylus*: Leptodactylidae)." *Herpetologica*, 26(2):172-180.
- . 1970a. "A taxonomic revision of the leptodactylid frog genus *Syrrophus* Cope." *Univ. Kansas Mus. Natl. Hist. Publ.*, 20:1-45.
- Mitchell, R.W. 1968. "*Typhlochactas*, a new genus of eyeless cave scorpions from Mexico (Scorpionida, Chactidae)." *Ann. Speleol.*, 23(4):753-777.
- . 1969. "A comparison of temperate and tropical cave communities." *Southwestern Nat.*, 14:73-88.
- . 1969a. "The cover illustration, *Cryptocellus osorioi*, (Arachnida; Ricinulei)." *Southwestern Nat.*, 14(1):136-138.
- . 1970. "Population size and dispersion and species associations of a Mexican cavernicole ricinuleid (Arachn.)." *Ciencia*, 27(2-3):63-74.
- . 1971. "Egg and young guarding by a Mexican cave-dwelling harvestman, *Hoplobunus boneti* (Arachnida)." *Southwestern Nat.*, 15(3):392-394.
- . 1971a. "*Typhlochactas elliotti*, a new eyeless cave scorpion from Mexico (Scorpionida, Chactidae)." *Ann. Speleol.*, 26(1):135-148.
- , and Masaharu Kawakatsu. 1972. "A new family, genus, and species of cave-adapted planarian from Mexico (Turbellaria, Tricladida, Maricola)." *Occ. Pap. Mus. Texas Tech Univ.*, 8. 16 pp.
- Mollhagen, Tony. 1971. "Checklist of bats in caves in the regions of the Sierra de Guatemala and Sierra de El Abra, northeastern Mexico." *Bull. Assoc. Mex. Cave Stud.*, 4:19-22.
- Muchmore, W.B. 1969. "A cavernicolous *Tyrannochthonius* from Mexico (Arachn., Chelon., Chthon.)." *Ciencia*, 27:31-32.
- . 1972. "New diplosphyronid pseudoscorpions, mainly cavernicolous, from Mexico (Arachnida, Pseudoscorpionida)." *Trans. Amer. Microscop. Soc.*, 91(3):261-276.
- . 1972a. "The unique, cave restricted genus *Aphrastochthonius* (Pseudoscorpionida, Chthoniidae)." *Proc. Biol. Soc. Washington*, 85:433-444.
- Peck, S.B. 1968. "A new cave catopid beetle from Mexico, with a discussion of its evolution." *Psyche*, 75(2):91-98.
- . 1971. "New and poorly known *Ptomaphagus* from Mexican caves (Coleoptera; Leiodidae; Catopinae)." *Assoc. Mex. Cave Stud. Bull.*, 4:9-12.

- Pittard, Kay, and R.W. Mitchell. 1972. "Comparative morphology of the life stages of *Cryptocellus pelaezi* (Arachnida, Ricinulei)." Grad. Stud., Texas Tech Univ., 1. 77 pp.
- Reddell, J.R. 1971. "A checklist of the cave fauna of Mexico. III. New records from southern Mexico." Assoc. Mex. Cave Stud. Bull., 4:217-230.
- . 1971a. "A preliminary bibliography of Mexican cave biology, with a checklist of published records." Assoc. Mex. Cave Stud. Bull., 3:1-184.
- , and R.W. Mitchell. 1971. "A checklist of the cave fauna of Mexico. I. Sierra de El Abra, Tamaulipas and San Luis Potosi." Assoc. Mex. Cave Stud. Bull., 4:137-180.
- , and R.W. Mitchell. 1971a. "A checklist of the cave fauna of Mexico. II. Sierra de Guatemala, Tamaulipas." Assoc. Mex. Cave Stud. Bull., 4:181-215.
- , and R.W. Mitchell, eds. 1971b. "Studies on the cavernicole fauna of Mexico." Assoc. Mex. Cave Stud. Bull., 4:1-239.
- Roth, V.D. 1968. "The spider genus *Tegenaria* in the Western Hemisphere (Agelenidae)." Amer. Mus. Nov., 2323. 33 pp.
- Rowland, J.M. 1971. "*Agastoschizomus lucifer*, a new genus and species of cavernicole schizomid (Arachnida, Schizomida) from Mexico." Bull. Assoc. Mex. Cave Stud., 4:13-17.
- . 1971a. "New species of schizomids (Arachnida, Schizomida) from Mexican caves." Bull. Assoc. Mex. Cave Stud., 4:117-126.
- Schultz, G.A. 1964. "*Mexiconiscus tlamayaensis*, a new genus and species of terrestrial cave isopod from San Luis Potosi, Mexico." Trans. Amer. Microscop. Soc., 83(4):376-380.
- . 1965. "Terrestrial isopods from caves and mines in Texas and northern Mexico with a description of *Venezillo tanneri* (Mulaik and Mulaik) allotype." Texas J. Sci., 17(1):101-109.
- . 1968. "*Xilitloniscus* Bowman a synonym of *Mexiconiscus* Schultz with notes on the species involved (Isopoda, Oniscoidea)." Crustaceana, 14(3):255-258.
- . 1970. "*Cylindroniscus vallesensis* sp. nov.: Description with review of genus (Isopoda, Trichoniscidae)." Trans. Amer. Microscop. Soc., 89(3):407-412.
- . 1970a. "Disposition of species of terrestrial isopod crustaceans of the genera *Synuropus*, *Sphaerarmadillo*, *Sphaeroniscus* and *Scleropactes* (Oniscoidea, Sphaeroniscidae)." Proc. Biol. Soc. Washington, 83(10):123-132.
- Spilman, T.J. 1968. "Two new species of *Niptus* from North American caves (Coleoptera: Ptinidae)." Southwestern Nat., 13(2):193-200.
- Vandel, A. 1965. "Les Trichoniscidae cavernicoles (Isopoda Terrestria; Crustacea) de l'Amerique du Nord." Annal. Speleol., 20(3):347-389.
- . 1970. "Un troisieme oniscoide cavernicole menant une vie aquatique: *Mexiconiscus laevis* (Rioja)." Annal. Speleol., 25(1):161-171.
- Wiley, Suzanne, and R.W. Mitchell. 1971. "A bibliography of the Mexican eyeless characin fishes of the genus *Astyanax*." Bull. Assoc. Mex. Cave Stud., 4:231-239.


~~~~~

**ASSOCIATION FOR**

***Mexican Cave Studies***

~~~~~

NEWSLETTER

Volume IV Number 2

December 1973



NEWS AND NOTES

TRIP REPORTS

Aquismón
Sierra de El Abra
Río Tampaón
Valle de los Fantasma
Durango and Chihuahua
Pozo de Gavilán
Sierra de Tamaulipas
Ayutla
Cd. Valles
Yucatán
Río San Gerónimo

ARTICLES

1969 Mexico-Guatemala Cave Biology
Field Trip Report

The Association for Mexican Cave Studies
is a non-profit organization
whose goals are the
collection and dissemination
of information concerning
Mexican caves

The AMCS publishes a Newsletter
Bulletin and Cave Report Series
which are available
to any sincerely interested
conservation-minded person

The AMCS Newsletter
is published six issues per volume
as frequently as necessary
at a cost of \$4 US per volume.

Information concerning
the other publications
is available upon request

Potential contributors are urged
to submit articles for publication

The article may cover any phase
of Mexican speleology

Trip reports are requested
from all trips

Send all material to

James Reddell or William Elliott
Association for Mexican Cave Studies
Dept. of Biology, Texas Tech University
Lubbock, Texas 79409 USA

Publications Editor Terry W. Raines

Newsletter Editors William R. Elliott
James R. Reddell

Cave Files William H. Russell

Secretary-Treasurer Jan E. Lewis

Coordinating Biologist James R. Reddell

Graphics Consultant Chuck Bryan

Production Assistance Neal Morris

Barbara Vinson



THE SPELEO PRESS

Austin

=====

ASSOCIATION FOR

Mexican Cave Studies

=====

NEWSLETTER

Volume IV Number 2

December 1973



NEWS AND NOTES

TRIP REPORTS

Aquismón
Sierra de El Abra
Río Tampaón
Valle de los Fantasma
Durango and Chihuahua
Pozo de Gavilán
Sierra de Tamaulipas
Ayutla
Cd. Valles
Yucatán
Río San Gerónimo

ARTICLES

1969 Mexico-Guatemala Cave Biology
Field Trip Report

NEWS AND NOTES

AMCS Bulletin 5, *Studies on the Cavernicole Fauna of México and Adjacent Regions*, is now available. It is edited by Robert W. Mitchell and James R. Reddell, contains the description of many new species of cave animal from México, Texas, Belize, and Guatemala. It is available to AMCS members for \$5.00 (softbound) and \$7.00 (hardbound); to others the cost is \$8.00 (softbound) and \$10.00 (hardbound).

AMCS night is held every Monday night from about 7:30 on at 616 W. 33rd St. Everyone is invited to come along, show slides, collate AMCS Newsletters, talk Mexican caving, and work at whatever odd jobs need to be done for the AMCS. People from out-of-town are urged to drop by anytime they are passing through on their way to México. The AMCS has good files on every area in México and can bring you up to date on the latest discoveries in Mexican caving.

The Cave Research Foundation is sending a team of cavers to Costa Rica to survey the caves of the Barra Honda karst area. The expedition is at the request of the Costa Rican government and will last from December 1 to early January.

Several groups of Mexican cavers are planning an expedition to descend Sótano de las Golondrinas, San Luis Potosí.

Enorme Grieta Causa Inquietud en Oaxaca

ACATLAN DE PEREZ DE NORIEGA, Oax., Sept. 5 (CGV).—Enorme grieta, de aproximadamente 30 metros de diámetro y una profundidad que se calcula en 90 metros, es motivo de alarma entre los pobladores de este lugar.

Las autoridades municipales y técnicos de la Comisión del Papaloapan y de PEMEX se disponen a iniciar estudios en el interior de la grieta, la cual se hizo debido al sismo del 28 del mes de agosto próximo pasado.

El señor Maximiliano Virgen Gómez, jefe de la zona ejidal del lugar señaló hoy a la CGV que la enorme grieta se "tragó" parte de una parcela sembrada de caña propiedad del señor Rosalino Rosado.

Agregó que un geólogo visitante les manifestó que era posible que esa tierra "tepetatosa" a unos 50 metros de profundidad corriera un río subterráneo, que se descubrió con el asentamiento de tierra.

TRIP REPORTS

Date: Christmas-New Year's vacation 1968-69

Destination: Aquismón, southern San Luis Potosí, W into Querétaro

Persons: Jerry Broadus, Bill Calvert, Bill Russell

Reported by: Bill Russell

This trip was planned to investigate the area just NE of Sótano de las Golondrinas and then to travel W through Tansosob to Rancho Nuevo at the N end of the La Parada solution valley. From Rancho Nuevo we hoped to follow the La Parada valley through La Parada and up into the NW part of the high area (above 2000 m) between Xilitla and Aquismón.

We left Aquismón after obtaining a letter of permission and followed the Tamapatz trail to the first pass (Puerto Tampate) and then turned N along the valley between the Sierra de Aquismón to the E and the Sierra de Linja to the W. We followed this valley N for several miles past Rancho Bocate but no caves or pits were reported in this area. After several hours we crossed the steep pass (Puerto Tanchanmul) across the Sierra de Linja and followed the trail down to Rancho de Linja. About 3 km W of Rancho de Linja and about 3 m S of the trail to Tansosob is Cueva del Agua. This horizontal cave is about 100 m long, from 2 to 3 m high and 3 to 10 m wide, except where a passage leads left for about 10 m just past the entrance. The cave contains only small pools of water. From this cave we continued W to Cueva de San Rafael just N of the village of San Rafael, about 3 km N of Sótano de las Golondrinas. Cueva de San Rafael had been located on a previous trip but had been explored for only a few meters. A small valley leads down the mountain to the cave, which apparently takes much floodwater. The entrance sink is easily climbed and from the bottom a crawlway 1 m high and 1.2 m wide extends for about 100 m to a climbable 5 m drop. From this drop a narrow slot leads 17 m to a 2 m drop to the lip of a pit about 13 m deep, immediately followed by another pit about as deep. These last two pits were not climbable and were not entered.

After cooking dinner we walked down to Tansosob and the town officials offered to let us camp in the municipal storeroom. We accepted their offer and next morning left Tansosob, S.L.P., for Rancho Nuevo, Qro. At Rancho Nuevo we were told of two caves, not large, one in town and the other, thought to be the largest, about a mile N of town. We decided to go to the larger. One of the local people took us to the entrance, a brush-covered crawlway at the base of a low, rocky hill in the center of the otherwise flat valley. The cave is about 35 m long, mostly a crawlway with several domes and contains numerous ants, and so was named Cueva de las Hormigas. After visiting the cave, the local guide decided the cave in town was larger after all. We rejoined the main La Parada-Rancho Nuevo trail at Rancho Esperanza. About 2 km N of Rancho Esperanza we located a 17 m pit, apparently a dead end, just to the W of the trail. We had heard of a large cave near a weirdly eroded cliff called Peña Borrada, just W of Rancho de Clavo. Treasure (from bandits) was

supposedly hidden in the cave, but when we arrived at Rancho de Clavo, we could find no one who knew of the exact location of the cave, as all the men were in the fields working, so we continued N along the valley.

Near Rancho Nuevo the valley is almost tropical, with banana trees mixed with varied hardwoods. North along the apparently flat valley floor are oak woods which finally give way to cleared fields. Then past La Parada the valley contains large pine trees. The flat pine-covered valley floor surrounded by high wooded mountains creates an impression of one's own private Yosemite. As we left La Parada we passed a man carrying water home. He asked us where we were going and we told him we hoped to climb Cerro San Juan and look for caves. This seemed more interesting than domestic life so after his delivering a brief message to his wife we gained Emiliano Rubio as a new member of our group. He had a friend who lived in Rancho San Juan, about 8 km nearer the high peak and he suggested we stay at his friend's house, so as the sun set we walked along the valley, and when we reached Rancho San Juan it was dark. Emiliano's friend wanted us to stay in his house, which already held a large family and several animals. We were offered the beds, but we insisted on using our camping equipment and after much persuasion camped outside.

The topographic map (Valles sheet: Mexico 1:100,000) indicates the La Parada valley ends just S of La Parada against the Xilitla high area. In reality the valley turns W and opens to the W toward Tancoyol, gaining at most only a few meters in elevation. From this E-W extension of the La Parada valley, a wide valley extends S to Rancho San Juan at the base of the high area.

The next morning Emiliano's friend, Francisco Roja, joined us and we started up the mountain, Cerro San Juan, about 6.5 km away and two or three thousand meters higher than Rancho San Juan. About 2 km S of the spring, Nacimiento de San Juan, we passed a sótano a few meters W of the trail, just N of the large cliff called Peña Blanca. Named by our guides for the palm-like vegetation around the entrance, Sótano de las Palmas appeared to be about 5 m deep. About 11:00 we heard voices hailing us from higher up the mountain. The voices were almost unintelligible, but Emiliano and Francisco apparently understood, and answered that we were coming with carbide lights. We left the trail and zig-zagged up through thick brush and karren, finally reaching two hunters who had trapped a javelina in a small cave. They wanted us to go in and get the javelina. The cave was narrow, but I squeezed in and finally located the pig. Then those outside passed me a noose on the end of a rope, but it wouldn't catch on the pig's head, which tapered forward. The javelina was just beyond and slightly below two horizontal slabs of rock less than a foot apart, but one of the hunters managed to squeeze in and with difficulty we maneuvered his .22 so that the end of the barrel was between the pig's eyes. Unfortunately the first shot, even though delivered from only two inches away, only made the pig mad, and it tried to get to us with its jaws working furiously. The rifle was only a single shot and the bullets were outside, but I managed to push the pig back with a stick brought in to push the noose over its pointed head, while another bullet was passed in. The next shot ended the pig problem, and after cleaning it we continued up the mountain, camping at a small spring just below the summit. The entire La Parada valley, a good day's walk, lay below us, and other ranges stretched into the distance.

The next morning the mountain was shrouded in clouds and after waiting for several hours, we decided it would probably rain and abandoned our attempt to check more of the Xilitla high area. We returned to Rancho San Juan just ahead of the rain, and walked on to La Parada in the rain, to spend New Year's night in the church storehouse. The next day we visited Sótano el Fin, at the end of the long arroyo that runs from Cerro San Juan through Rancho San Juan, along the valley past La Parada and into the small sótano, where the Tamapatz trail leaves the

valley. The entrance is only 0.8 m in diameter, but the pit enlarges into a series of domepits leading downward to a 10 m unclimbable drop. From here we walked through the drizzle and karst to Tamapatz, stopping by to visit a group from Southwest Texas College who were exploring caves in the Agua Amarga area. We spent the night in Tamapatz, and the next day returned to Aquismón and started back to Texas.

Date: February 1969

Destination: The Sierra de El Abra; aerial reconnaissance from Gómez Farfías, Tamps; through the Cd. Mante-Cd. Valles area S to Aquismón, S.L.P.

Persons: Tom Albert, Dr. Richard Albert, Dr. Robert Mitchell, Tony Mollhagen, James Reddell, Dr. Francis Rose, Bill Russell, Richard Smith

Reported by: Bill Russell

Dr. Mitchell had obtained a grant from the International Commission for Arid and Semiarid Land Studies and the American Philosophical Society to investigate the blind fish of the Sierra de El Abra region. The first problem was to get an idea of the distribution of the blind fish. This involved locating all possible fish caves over a wide area, and it was decided to use an initial aerial reconnaissance to locate the caves with entrances visible from the air. This aerial reconnaissance was quite successful. The following list gives the new caves located on this trip from S to N. Some of the data given was obtained on later trips.

Large cave entrance on the Río Tampaón (on some maps the Río Tamuñ or the Río Santa María). The entrance has a large stream flowing from it and is located about 2 km downstream from Cascada de Tamul, a waterfall reportedly 105 m high (it looked to be about 40 m from the air) where the Río Galeanas (the downstream part of the Río Ojo Frío) flows into the Río Tampaón.

Sinkhole about 300 m SW of the Hotel Taninul. Might not contain cave.

Possible cave just above RR track between E end of Valles pass and Nacimiento del Río Choy.

Cave with 2 entrances on crest of range by powerline that runs ENE from Valles. Reportedly contains deep pit.

Two new caves near Ventana Jabalí on the E face of the range. They are being mined for phosphates.

Sótano del Soyate, just off the road to Cueva Pinta, a 217 m pit to a large lake. Not visible from the air.

Pit just S of Arroyo Yerbaniz W of Highway 85 at Rancho Rodeo (K 483.9).

Sótano del Japonés, about 2 km W of Highway 85 at the end of Arroyo Japonés, which crosses the highway at K 485. A complex series of passages not yet explored. Receives floodwater from large area.

Sótano del Matepalma. In the same valley as Sótano de Yerbaniz. Takes some floodwater from surrounding area. Not yet fully explored.

Sótano del Yerbaniz. About 400 m W of highway from K 488.4. Pit is at the end of Arroyo Yerbaniz. Large complex system about 137 m deep on several levels. Receives much floodwater.

Two apparently deep sinks on the top of the range, just W of the E face about 8 km N of Ventana Jabalí.

New cave on the E face of the El Abra S of Cueva La Ceiba.

Cueva de Tanchipa. About 16 km NE from Ponciano Arriaga (Rancho San Ricardo). The large

entrance to this cave is located on the W slope of the range near a small church. Cave is reportedly large.

Deep pit about 2 km N of Cueva de Tanchipa.

New cave mined for phosphates, reached by trail from road S of El Abra, Tamps. Cave is not visible from the air, but road to cave is.

Two shallow (about 10 m) sinks above the town of Quintero.

A pit in the karren about 2 km N of Bee Cave, SW Gómez Farfas.

Persons wishing to visit these, or other unexplored caves located recently in the Sierra de El Abra are urged to write the AMCS for additional information, as the locations and descriptions in this list are necessarily brief.

Date: Easter vacation 1969

Destination: Canyon of the Río Tampaón, just S of Cd. Valles, S.L.P.

Persons: Joe Cepeda, Phyllis Della Croce, Donna Lovelace, Eugene Haydon, Bill and Carol Russell.

Reported by: Bill Russell.

This trip was planned to visit caves in the canyon of the Río Tampaón (or Tamuñ) also called the Santa María upstream) and then to walk across the Tanchachín valley into the next canyon and visit the large cave downstream from the Cascada de Tamul. The group waded upstream to the Puente de Dios, a large natural bridge of travertine where the river flows underground for about 200 m. The surface of the bridge is only about 3 m above water level, and the stream siphons beneath it. Above the bridge the river is deep and we climbed along the rocky S bank and camped near the first rapids above the bridge. The next day progress was so slow that we decided to return. We camped the next night just above the natural bridge after building a log raft and floating back down the river. Next morning, Eugene Haydon and Bill and Carol Russell visited Cueva de los Patos, located at water level just inside the entrance to the canyon on the N side of the river. The cave is a tube averaging about 3 m in diameter, and was explored for about 135 m. The cave continued, but we returned to the truck and drove N of Mante to the Cañon de Servilleta, where the Río Comandante (called Río Boquilla to the W) crosses the Sierra de El Abra (called the Sierra de Cucharas near Mante). On the N side of the canyon near where it leaves the mountains is Cueva de Riachuelo, visited by Eugene Haydon, Joe Cepeda, and Bill Russell, which we found to be about 100 m long and from 3 to 7 m high. The cave is dry and has been mined for phosphates. A few hundred meters N of the canyon is the large spring, Nacimiento de Riachuelo. After leaving the cave and spring, we returned to Austin.

Date: 14-23 May 1972

Destination: Valle de los Fantasma, San Luis Potosí

Persons: Bill Elliott, Pam Lynn, Mike McEachern, Ron Ralph

Reported by: Bill Elliott

14 May 1972. The four of us left Austin at 1:00 AM and drove to Laredo before dawn. By 9:00 PM we were eating in San Luis Potosí, and by 12:30 AM we were camped just south of San Francisco, about 40 km E of San Luis Potosí, in the Valle de los Fantasma area (elevation about 2700 m).

15 May 1972. We continued S from San Francisco on a dirt road 20 km to Cueva de la Puente. About 16 km S of San Francisco is a pumphouse which pumps water over the range to Mina de las Cuevas, a fluorite operation near Zaragoza. Many caves are reported to be in that area. We visited a small, open-pit fluorite mine (Mina de las Juanitas de la Fluorita) just E of the main road 17 km S of San Francisco. We reached the La Puente dolina about 2:00 PM. Cueva de la Puente is a large cave which was surveyed to 2335 m in 1968 by the Southwest Texas University Grotto. It is formed in metamorphosed limestone. The dolina is actually a north-south limestone valley which is blocked at the south end by a volcanic bridge (La Puente). The cave drains the entire dolina, which is about 1 km long, 1.5 km wide, and about 100 m deep. We entered the upper entrance of the cave at 2:30 PM and collected the cave life and photographed along the way. About 570 m inside the entrance Ron and I explored an unmapped fissure to the right for about 300 m. This fissure is the source of a small stream which flows into the main passage and toward the back of the cave. The fissure is very narrow and one must chimney along slippery ledges until it ends in a breakdown room.

The cave is very interesting hydrologically and mineralogically. Great streaks of red and yellow are frequently seen in the walls and ceiling. The floor is covered with limestone, lava, and serpentine cobbles, and, frequently, sand. When we came to the main stream source, which enters from a passage on the left, we followed it upstream for several hundred ft over thundering cascades and through blue-green pools. We saw many wooden survey stakes in the main passage leading to the main stream. We later learned from one of the local men that fluorite miners were thinking of pumping the water out for mining operations. Having explored about 2000 m of the cave, and having collected mites, beetles, spiders, giant water bugs, caddis fly numphs, snails, and dragonfly larvae, we left the cave at 8:00 PM and camped at La Puente.

16 May 1972. We again entered the cave, but this time through the lower, larger entrance, which we photographed. Pam returned to camp to sew her chest harness. We went to the main stream source at the back of the cave and photographed the cascades and stream passage. We located the beautiful shield formation at the top of a slope and photographed it. It is a very translucent white. We followed the stream 70 to 100 m to a big log jam, which was a good collecting place. Beautiful bell-rope fungi were on the logs and we photographed them. I later discovered that my flash synch was out of adjustment, so I lost many shots. We continued collecting on the way out and got a bat (probably *Artibeus jamaicensis*) from a small colony near the upper entrance. This is the only known bat cave in the Valle de los Fantasma area, probably because the cave is much warmer than the others (70°-71°F compared to a typical 54°-63° F). This might be because of "hang-over heat" from volcanism. We camped in the dolina that night.

17 May 1972. On the way back to San Francisco we checked out a dirt and sawdust-filled sink, and another dirt-filled sink to no avail. The area is well-karsted. Just S of San Francisco we took a look at Sótano de Puerto de los Lobos, a 207 m pit which Joe Sumner, Duane Faith, Jim McIntire and I explored in September 1968. We picked up some supplies at the store in San Francisco and found a note from Bob Mitchell, who had been through on his way to Valles with Francis Abernethy and Dub Rhodes. Just uphill and S of town, Mike and I entered Sótano de San Francisco no. 2 with inner tubes. Dave Honea and I began mapping this 50 m pit in January 1970 until we hit a water passage. After losing a hunk of my beard to my brake bars (a definite hazard), I rappelled into the 54°F water, paddled 8 m, turned a corner to the left, and found that the cave ended quickly in a mud bank. After collecting many water striders and harvestmen, taking a few compass bearings, and making a few sketches, we left the cave. We camped in a dirt-filled sink near San Francisco that night.

18 May 1972. Pam, Ron, and I picked up a local man who agreed to guide us to Cueva de

Cinquenta y Ocho. We drove 4 km S of San Francisco to the village of Cinquenta y Ocho and hiked up a valley to the west for about 1/2 hour to the small entrance of the cave high on the south valley wall. The cave is about 115 m long, 3 m wide, and 5 m high. The air temperature is 58° at the back. We collected spiders, crickets, and beetles in the back and mapped out. We returned to camp at 4:00 PM and ate. Mike, Pam, and I then drove W of San Francisco about 4 km and up a cobblestone road leading to a microwave tower to get to Cueva de los Caballos, which I had visited three years before. We collected in the large entrance room (which is sometimes used to corral horses) and in the 35 m crawlway leading off from the south end of the room. A low room in the back yielded spiders, crickets, and a campodeid dipluran. The air temperature was 62°F. We returned to camp for the night.

19 May 1972. We walked down to Sótano de San Francisco, which is in town. This impressive 5 m diameter shaft usually takes a small surface stream, which was dry this day. John Fish entered this pit in 1968 but was not able to see much because the waterfall put out his light. Ron and Mike entered with inner tubes and mapping gear while Pam and I waited on top with a measuring wire. The entrance measured 112 m deep. They returned two or three hours later ready for a bath. The surface stream apparently serves as the local sewer system and the bottom of the entrance is a grotesque cesspool that one has to paddle through. They mapped 23 m through the 5 m wide cesspool-passage to the bottom of a 2 m drop, then 7 m over dry ground to a 13 m long pool which ends at the top of a deep pit. Rocks were dropped into the pit and took 7 to 9 seconds to hit bottom (180 to 270 m). They turned back due to lack of rope. This pit could lead to an extensive system, but the cave will be unpleasant to explore unless it has recently been douched out by heavy rains. Wet suits will definitely be in order (the two pools were 58°F and 59°F). Ron and Mike received a well-earned bath. After a meal, we drove 2 km W to Valle de los Fantasma and turned N on a dirt road. We drove past a “cal” (cooking lime) plant and northward for 3 km and then camped.

20 May 1972. We continued N for 2 more km, led by some children to a cave on the west side of a large pond. The kids didn’t have a name for it, so we agreed to call it “Cueva de la Laguna.” The 6 m wide, 2 to 3 m high entrance leads into a 13 m long, 5 to 7 m wide room, then under a natural bridge to a room about 10 m square. The passage continued for about 10 m to a crawlway which goes up and to the left for 5 to 6 m. About 37 m of the cave was mapped. The air temperature was 63°F. We spent an hour collecting crickets and large *Ctenus* spiders, then left. The road probably continues N and may lead to better cave country. We drove E to Río Verde, then S to Ayutla, where we camped by the river.

21 May 1972. We drove to Xilitla, where we peered into Sótano de San Antonio, toured the market, and photographed the sprawling grounds of the surrealistic “Aldous Huxley” house just N of town. We drove on to Valles and spent the night at the caver house on Calle Boca Negra.

22 May 1972. After settling accounts, Mike and I left for Austin, leaving Ron and Pam to go on the Sótano del Buque expedition. We returned to Austin by the next morning.

Date: 10-22 June 1972

Destination: Durango and Chihuahua

Persons: Ed Alexander, William Elliott, Carl Kunath, Angie McLaughlin, and James Reddell

Reported by: James Reddell

10 June 1972. Bill Elliott, Carl Kunath, and James Reddell left Austin about 3:30 PM and

drove to 15 km S of Cuatrociénegas and camped.

11 June 1972. We drove directly to Cueva del Diablo, 4 km W of Salafces, Chihuahua, where we were to meet Terry Raines, Ron Ralph, and Jan Lewis. Since they failed to appear, we entered the cave and began to map. A crawl leads out of the bottom of the large entrance sink and extends back a short distance to a walking passage. This passage branches, with one way extending as a long, unexplored crawl, and the other dropping steeply down and eventually intersecting a deep unentered pit over which a ladder has been placed. After about 30 m more a complex maze is encountered. We mapped back to the beginning of the maze before leaving the cave and camping. During the night a violent thunderstorm kept us from getting much sleep.

12 June 1972. We continued the map of Cueva del Diablo, surveying all right-hand passages. After a few hundred ft, a steel ladder about 7 m tall must be climbed. This was climbed and we began the survey of a fantastic complexity of rooms and crawls, but realizing the enormity of the job, we gave up and returned to the bottom of the ladder and surveyed down the next passage. We finished the survey of a small section of maze, Carl made some photographs, and we left. The cave is very warm (up to 74°F) and surveying or any activity is a real drudgery. A total of 410 m (true horizontal distance) was surveyed and a depth of 54 m reached, but much remains to be surveyed. We went into Jiménez for a part for Elliott's fuel pump, did a little cave hunting, and then camped back at the cave entrance.

13 June 1972. Ed Alexander and Angie McLaughlin drove up and Ed and I went into the cave to take some temperatures. We then drove S towards Gómez Palacio. The recent rains had caused heavy flooding along the road and many cars were stranded in the low water crossings. We drove on to Mapimí, then W and S to Rancho Descubridora. Cueva de la Siquita is reached by a now-abandoned mining road to its entrance and it is possible to drive to within a short distance of the entrance. This was an area of heavy mining activity and the cave itself was mined for phosphates. Ed and Bill went into the cave, which is a large sink entrance on the hillside dropping at a 55° angle to a depth of 64 m. They explored the cave and exited after about 3 hrs, reporting the discovery of blind amphipods in a pool.

14 June 1972. We camped below the entrance and in the morning Bill, Ed, and I went into the cave, mapped it (332 m long THD, 86 m deep), and made a collection. The most exciting find was some troglobitic amphipods of the genus *Mexiweckelia*. This is the second species of blind amphipods from caves in México, and the only aquatic species of any cave animal from western México. The cave is a fissure passage about 25 m high with about 10 m of fill removed from the original cave floor. At the end of the fissure a large bat room is encountered, with no significant leads from it. The water temperature was 78°F and the air temperature ranged from 73°F to 82°F. We spent 7 hrs in the cave mapping and collecting. The entrance pit is very attractive and requires a minimum of actual prusiking. We drove to Mapimí (after looking around the old mining town and checking out a test pit) and then south of town and camped.

15 June 1972. We arose fairly early and made the very pleasant hike up a spectacular canyon (about a 330 m climb) to Cueva de los Riscos. A small entrance opens immediately into a large passage about 330 m long and containing many large attractive columns and other formations. Several 15-20 m deep pits in the floor of the room were unexplored due to lack of equipment. Near the end a climb up over flowstone leads into a complex of small rooms and pits in which many blind animals were found. Of great interest is the only certainly troglobitic ricinuleid in the world, *Cryptocellus reddelli* Gertsch. These are very rare but we were able to find one adult and one immature specimen. We mapped 381 m (THD) and sketched in the last

few rooms (about 70 m). The cave reaches a depth of only about 17 m at the back, but the pits may lead to extensive lower levels. Carl took several photographs and then we hiked down and drove to south of Torreón and camped.

16 June 1972. Carl, Bill, and I hiked up to Cueva del Guano near the town of Picardías S of Torreón. We mapped from the large impressive entrance through a really grim bat passage, down a slope and into the first of several very interesting sloping rooms. The heat of the cave (76°-80°F) is very oppressive and the ammonia, insects and bats in the bat passage saps one's energy and reduces enthusiasm rapidly. Carl made a nice find when he discovered spider beetles in the guano. These rare beetles are known from but a few localities in México. We left the cave and drove on into Torreón, where we tried to wash the stench off of us, got a good meal, and found what entertainment we could.

17 June 1972. The next morning we drove back to Cueva del Guano and Ed, Bill, and I re-entered the cave and mapped the remainder of it. A total of 600 m (THD) was surveyed in the two days, and a depth of 44 m reached. The cave is very interesting speleologically and mineralogically and deserves a great deal of study. Anyone visiting it should be prepared for a miserable experience. The cave is, incidentally, also notorious for being a harbor of histoplasmosis. It was originally a phosphate mine, but many miners died and others were very sick shortly after mining began, so it was shut down. From here we drove S to Lerdo and camped.

18 June 1972. We drove on to Nazas and then on a dirt road to San Luis de Cordero. Difficulties in finding the cave and with local people, combined with the lateness of the day, convinced us it would be better to return another time, so we left. The cave (Cueva de los Riscos) is reported to have been intersected by a mine shaft and to be quite pretty and very large, so it is worth a return visit. We washed clothes in the Río Nazas, and drove on to near Emilio Carranza and camped.

19 June 1972. We drove on E of Torreón, where Ed's truck broke down just beyond Entroque La Cuchilla and right in front of Cueva del Empalme. While Ed, Carl, and Bill went into town for a part I ran into the cave for a couple of hundred ft but found no life. It is a dry cave formed by the solution of a gypsum layer out of the surrounding limestone. We camped 16 km N of Entroque San Roberto after continuous trouble with Bill's fuel pump. It was a cold, miserable night (36°F).

20 June 1972. We drove on to Matehuala and then to Real de Catorce. After replacing the fuel pump, various Mexican maladies set in and Angie, Carl, and Bill were all sick. Real de Catorce is an old mining town, which in the early 1900's had a population of 25,000 but now is reduced to about 300. The town is reached by an old tunnel more than 2 km long through the mountain-side. The ruins are very impressive and it is an exceptionally pleasant place. We camped at the edge of town at an elevation of 3000 m.

21 June 1972. We spent some time looking around the town and asking about caves (none in the vicinity of the town itself; however, see the January 1973 *Texas Caver* for a map and report on La Cueva-Mina del Real de Catorce by Mike Walsh). We drove down the mountain and back to Matehuala where Ed and Angie left us to go on to Valles. We drove on from Entroque San Roberto to Galeana where we looked at the Pozo de Gavilán and then drove N of Linares and camped.

22 June 1972. We drove N to Cola del Caballo, where Carl and Bill looked at the waterfall. We then crossed at Falcon Dam and drove back to Austin.

Date: 7-14 July 1972

Destination: Pozo de Gavilán and other points in México

Location: SMO, etc.

Persons: Wayne Russell, Matt and Susie Farrar, Glenn Darilek, Steven Fleming, John Graves, Scott Harden.

Reported by: Scott Harden

A few leads were checked on the mountainous road from Linares to Galeana. These proved to be a dead-end shelter, a small unentered nacimiento and a cave directly under the road which contained vampire bats and a pit, but it wasn't fully explored. We continued to El Pozo and were truly impressed by the immense pit. Wayne brought his rubber raft and we toured the lake at the bottom. That night Glenn defeated a local pachuco in a game of billiards.

After leaving the area the next morning and heading for Linares, Matt was driving on the wrong side of the road when he encountered a VW bus coming around the curve. The results were minor (compared to what could have happened)—smashed fenders and impaired steering for the VW. Matt paid his 200 peso fine and we departed. Stopping at Montemorelos, the others continued homeward while I headed south on a solo hitch-hiking journey.

The first people to pick me up were a Mexican in his mid-forties and his 13 yr old American girlfriend. We spent the night and part of the next day at Nacimiento del Río Frío. Then went to Papantla where the guy is engaged in the cockfighting business. Saw the ruins of Tajín and spent a night in a fantastic hotel in Tecolutla. Hitched my way down the coast and to Perote, where the 2nd class bus I was riding broke down. Here I lost \$20 to an expert and well-skilled thief. Spent the night in the bus station at Puebla, next morning decided to head home due to lack of funds. Views of the big volcanoes (Popo, Ixta, Malinche) from Puebla are incredible. Orizaba was obscured by clouds. At a Pemex station (which are the best places to hitch rides in México) I got a ride from a kindly nerd from Ohio who took me all the way to San Antonio.

The trip was somewhat disappointing because I had planned to visit Cacahuamilpa, Nevado de Toluca, and other neat places. But a learned man said, "You don't take the trip; the trip takes you."

Date: 5-16 August 1972

Destination: Sierra de Tamaulipas and Sierra de El Abra

Persons: N. Bouillier, C. Chabert, T. Couderc, B. Dressler, B. Landrin, P. Lepallier, F. Messelier, M. Raimond, J. Sautereau, M. Wajdenfeld, Bill Russell.

Le 5 août nous arrivons à Austin avec un mini-bus Volkswagen loué à San Antonio. Nous rencontrons chez Terry Raines les principaux membres de l'A.M.C.S.. Après une nuit de discussion (sans vin rouge, ce qui pour nous est un exploit), Bill Russell décide de se joindre à nous. Son aide sera très précieuse. Sans lui nous n'aurions jamais fait ce que nous avons fait. Le 6 août, nous arrivons au camp de Michel Siffre à Midnight Cave pour y prendre du matériel. Le 7, nous dormons sur la route de Laredo. Le lendemain, après avoir franchi la frontière mexicaine, nous campons près de Bustamante. Le 9, nous visitons la grotte: Gruta del Palmito. Ce qui nous étonne, ce ne sont pas ses dimensions ni les très belles stalagmites qu'elle contient mais la chaleur qui y règne. Ce sont aussi nos premiers contacts avec une végétation à laquelle les spéléologues européens ne sont pas habitués. Le 10 au soir, nous établissons le campement près du Río de Jaumave dans la Sierra de Tamaulipas. Le 11 est notre première journée d'exploration au Mexique. Du Rancho Picacho à environ 30 km de Ciudad Victoria, un berger nous guide dans la cañon de Fraile. Deux petites grottes sont explorées et topographiées: la Cueva

de Fraile et la Cueva del Cañon de Fraile. Dans la soirée, reconnaissance des Sótanos de Altos Cumbres près de la highway à 25 km de Ciudad Victoria. Le lendemain, un groupe continue l'exploration et la topographie des Sótanos de Altos Cumbres n° 1 et n° 2. Un autre groupe reconnaît dans la Sierra, à une heure de marche du Rancho Picacho des gouffres sans importance. Dans la soirée, une pointe rapide est effectuée à Hoya Verde, à 9 km de la highway. Les indigènes nous signalent trois sótanos à 2 et 3 heures de marche de là et d'autres sótanos haut dans la montagne. Le 13, nous prenons la direction de Gómez Farfás. Bill nous conduit au Sótano del Plan, dans le fond d'un polje, à 1,500 km du village. L'exploration et la topographie du gouffre (-130m) seront terminées le lendemain. Ce sera la plus importante cavité de notre campagne de reconnaissance.

Le 15, nous passons Ciudad Mante et profitons de la mise à sec du barrage pour visiter le Nacimiento del Río Mante, très impressionnante résurgence. Longue de 80 m environ, la cavité est obstruée par des éboulis. Selon Bill, le niveau des eaux a permis de gagner 30 m par rapport aux visites précédentes. Le 16, nous prenons la route de Xilitla, Jalpan, Pinal de Amoles. Nous voulons reconnaître un karst de haute altitude, à 2,700 m environ. Situé dans le llano de San Francisco mais malheureusement, ce sera pour nous la fin de notre campagne de reconnaissance: le moteur de la VW rend l'âme.

Le reste du séjour sera passé à prendre contact avec la Grupo Espeleologico Mexicano avec lequel nous visiterons la Grotte de Cacahuamilpa, le resumidero du Río San Jeronimo et surtout le très beau site des Dos Bocas. La double percée des ríos San Jeronimo et Chontalcoatlán est un phénomène rare au monde. Les eaux en crue en rendaient à l'époque la visite.

De retour au Texas, après la visite de la très belle grotte de Midnight, nous topographierons deux petites cavités découvertes par Jacques Chabert: Abran Cave et Hutto's Swallow Cave avant de reprendre le chemin de l'Europe.

Date: 10-22 December 1972

Destination: Ayutla, Querétaro

Location: SMO

Persons: Doug Strait (Ga.), Anne Knox (Ga.), Bill Horn (Pa.), Marion O. Smith (Ga.), Jim W. Gordon (Ga.), David Stidham (Tenn.), Ted Wilson (Ind.), Jim Youmans (Ga.), Jack W. Hart (Ga.), B.C. "Tommy" Thompson (Ala.), David Teal (Ala.)

Reported by: Marion O. Smith

Night of December 10-11: People in three vehicles congregated at the bridge over the Río Conca near Ayutla.

December 11: Plans fell through to acquire burros to carry gear to Rancho de Barro so the day was spent as a reorganization and rest day by some, and as a day of a "breaking-in" walk by others. Wilson, Stidham, Strait, Horn, Knox, Smith, and Gordon spent 3.5 hrs walking on the mountain north of the village of La Purisma searching in vain for two reported pits.

December 12: A guide and seven burros were obtained and the hike was made to Rancho de Barro. Permission was given by Judge Gregorio Gonzalez's son Guadalupe to camp in the school and schoolyard. Arrangements were made with him for pack animals to take the gear up to El Sótano.

December 13: The last leg of the journey to El Sótano was made by 11:30 AM and the pit was rigged a couple of hours later. The drop rigged was probably the 1,181-footer done by the Texans on the first descent. Three people did the drop: Smith, Teal, and Thompson.

December 14: Ten descents and ascents of El Sótano were made in this order: Horn, Youmans, Stidham, Gordon, Wilson, Knox, Strait, Hart, Thompson (2nd descent), and Smith (2nd descent). Teal, Thompson, and Smith earlier searched unsuccessfully for Craig Bittinger's deep crack in rocky brush near the campground, finding a 4 m deep, 3 m long "cave" with a mummified cow at one end and hundreds of black granddaddy longlegs-type spiders at the other. At 1:30 PM it was noted that the temperature at the top of El Sótano was 87° F.

December 15: It drizzled rain in the morning and was generally cold and foggy. De-rigging El Sótano was greatly delayed because the rope got snagged around a tree on the bottom. Strait made the descent (2nd descent) and untangled it. Finally by 3 PM the pit was de-rigged and camp broken. Gonzalez arrived with the burros and the group returned to Rancho de Barro. At 3:30 PM the temperature at camp was 38°F.

December 16: All members of the group returned to Ayutla. Gordon, Wilson, Knox, Thompson, Teal, and Strait stayed with the burros and went over the mountain pass. The rest made an interesting walk through Canyon de Ayutla, "checking" a couple of horizontal caves along the way. Camp was again made at the bridge. The total cost for guides and animals was 614 pesos (230 at Barro and 384 at Ayutla).

December 17: Operations were shifted to the Ahuacatlán (Querétaro) area. Dr. John P. Sevenair of Louisiana was added to the group near Jalpan. No burros were available in Ahuacatlán so it was decided to physically carry the 1500 ft Bluewater rope up the mountain along with full backpacks. In time there were three groups instead of just one. Thompson, Youmans, Hart, Wilson, Stidham, Strait, and Horn got ahead with the rope. Not understanding that they were supposed to turn to the right once the mountain top was reached, they carried the rope down the other side of the mountain and an hour's walk past the village of Guilotla before realizing their mistake. They turned around and spent the night in the schoolhouse at Guilotla. Gordon, Teal, Knox, and Smith spent the night in one two-man tent next to the large dolina near Sotanito de Ahuacatlán, and Dr. Sevenair spent the night by himself down on the main trail.

December 18: The group re-united and by 3 PM rigged the Sotanito. Then three two-man teams took their turns bottoming the 946 ft tube-like second drop: Hart and Youmans, Stidman and Thompson, and Wilson and Smith. The rest set up camp next to the entrance. The last person was out of the pit by 3:30 AM.

December 19: David Teal bottomed the Sotanito early in the morning and by 11 AM he, Youmans, Thompson, and Hart left for Aquismón. During the afternoon the Sotanito was de-rigged and the 1500 ft rope was hauled to 420 ft Sótano de Aguila. Strait, Horn, Knox, Sevenair, Smith, Stidham, and Wilson made the drop and by 6:15 PM returned to camp. Since food and water were almost exhausted it was decided that if any other pits were to be done in the area it had to be that night. So at 7:30 PM, after supper, the rope was transported around the large dolina to Macho del Rey where Smith, Strait, Stidham, and Horn did the 300 ft and 348 ft drops, and Knox did the 300 ft drop. A weary crew returned to camp at 3:45 AM.

December 20: The group lugged the rope and all other equipment off the mountain and returned to Ahuacatlán. There, after a much-needed meal, the group dispersed for hotels in Ciudad Valles. Along the way Smith and Stidham did roadside 376 ft Sótano de Pozo, and most of the others washed in the Río Huichihuayán near Xilitla. That night many of the group ate at the La Condesa in Valles where Texas cavers Neal Morris and Barbara Vinson, and F.R.O.G. (S. Ala.) caver Ken Branson happened to be. They had just returned from the El Abra where they had located an estimated 600 ft pit, Sótano de los Coatimundis. Meanwhile Youmans and crew hiked to Sótano de las Golondrinas.

December 21: More Texans (Dr. Stanley, Steven, and Craig Bittering and others) were met in the La Condesa at breakfast. They soon left to check out a pit near La Florida. Wilson returned south by bus to the Xilitla turnoff to meet his wife; Youmans and crew did Golondrinas, and the rest headed north.

December 22: Strait, Knox, Horn, and Sevenair visited Cueva del Abra and Grutas de Quintero south of Mante; Smith, Gordon, and Stidham visited Pozo de Gavilán near Galeana; and Hart, Youmans, Thompson, and Teal walked back to Aquismón. Then all but Dr. Sevenair returned to the States.

Date: 14 December 1972 - 5 January 1973

Destination: Cd. Valles, San Luis Potosí

Location: SMO

Persons: Neal Morris, Barbara Vinson, Kenny Branson

Reported by: Neal Morris

Barb, Kenny and I left Kingsville, Texas, by bus one evening, crossed the border at Reynosa, Tamaulipas, and continued by bus to Ponciana Arriaga, San Luis Potosí, where we arrived at noon the next day. From there we hitched a ride back down the road a few miles to Guajolote Corral. After eating lunch in the shivering cold, we stashed our excess gear in the jungle near the corral and started a seven hour hike to the top of the El Abra mountain range. We carried 600 ft of rope, food and water for five days, and all of our sleeping gear up to Cueva de Tanchipa where we set up base camp under the overhanging cliff of the entrance sink. Our main objective was to reach two big pits which had been spotted from the air to the north of Tanchipa.

The next morning we were elated by the appearance of six coatimundi. Soon we started down the trail with our caving gear. Just above Cueva de Tanchipa the trail reaches the crest of the range and winds through the wreckage of a Mexican airliner. A simple aluminum-roofed chapel and several crosses mark the site of the crash. The trail continues through the Chapel and turns north along the crest of the range. Only a few weeks earlier on a pre-Thanksgiving trip, we had chopped on compass bearings from the Chapel in search of several deep pits that had been spotted from the air and located on aerial photographs. On that trip we were only able to cut a path less than halfway to the pits, but we did chance across one deep small-diameter sótano. With our 600-ft rope, we rigged this pit which we named Sótano de los Coatimundis. The rope did not reach bottom.

The next day we were confined to the Tanchipa sink by cold and rainy weather. We resigned ourselves to domestic activities including the building of a hearth and the cleaning out of a large flat sleeping area for larger groups of cavers later to come.

The next day we again stopped at Sótano de los Coatimundis. Just a few feet from Coatimundi on the other side of the trail was another deep pit. It later proved to be a second entrance to Coatimundi. In the same area we found a dozen small pits of less than a hundred feet in depth. Continuing to the end of the trail that we had chopped on the last trip, we started chopping northward again toward the big pits. Our first landmark was a large sink or valley which we crossed. At the bottom of it we found a short gulley which led into a cave entrance. Kenny explored a short distance through breakdown crawls and reported no good leads. Continuing our chop down the range, it was late afternoon when reached the edge of the Star-shaped depression a tremendous solution valley. From William Russell's aerial recon trip and

the air photos, we knew that the big pits were somewhere on the northwestern flanks of the valley. We descended into the Star-shaped depression following a creek bed across it to the opposite wall which we climbed. Then following that wall to the west we knew that the pits lay just ahead of us. Unfortunately, it had gotten dark, and we were several miles from camp with our water supplies used up. With two carbide lights between the three of us, it was a slow return trip trying to follow our rough cut path through the dark jungle. The only water that we had seen on top of the El Abra was in a small pool in the Star-shaped depression creek bed from recent rains. Kenny collected some in an empty water jug and boiled it back at camp that night so we would at least have some water for the hike down to the highway the next day. Since we would be coming back in two weeks for further exploration, we decided to leave the 600 ft of rope stashed in Tanchipa.

We woke late the next morning, packed up and started down the mountain for water, the highway, food, and civilization in that order. At the highway, we flagged down a bus and rode into Valles where we got a hotel room and a good hot meal.

A couple of days later we joined up with the Bittinger group. Leaving Valles, we stopped at Media Luna for a swim and then drove on to Conca, Querétaro which is near the Ayutla-El Sótano area. Our group consisted of Dr. Stan Bittinger, Craig Bittinger, Steve Bittinger, David Kern, Kirt Kern, Robert Rhoades, Víctor H. Benalcázar, Kenny, Barbara and I. The destination was La Florida, a little town high in the mountains which Craig Bittinger, John Greer, and Clark Lillie had once hiked through. They reported good relations and a high density of pits in the area.

The next morning our group hired a guide with two machos to take us to La Florida. It was a long, steep hike. During his previous stay in La Florida, Craig became friends with the priest who permitted Craig, John, and Clark to stay in the church compound. Through Craig, our group was able to set up base camp in a fairly large church storeroom. Kenny and Craig explored several nice pits only a few hundred feet from the church that evening.

I was sick for the next few days and stayed in the church while the rest of the group went caving. Another group of cavers arrived which included Pete Strickland, Logan McNatt, Roy Jameson, Preston Forsythe, Jay Jordan, and Judy Williams which made our group total sixteen people. The priest really made us feel welcome and extended himself even to feeding us all supper one evening. Lots of hiking and caving was done in those few days. The most impressive pit explored was Sótano de Conrado, 520 ft deep. Cudisia, Cueva de Santo Domingo, and numerous other pits were explored within a radius of several miles around La Florida. This was strictly a reconnaissance trip to see what was in the area, and no surveying was done. However, we did get to celebrate Christmas eve with the people of the village which was quite an experience. The only source of electricity in La Florida was a broken generator that Dave and Victor tried unsuccessfully to fix. Out of friendship and a desire to improve the relations with the people, they finally agreed to take the generator back to Texas and have it fixed for the priest.

On the fifth day most of the group hiked down the mountain to Conca and went in Peter's truck to Ocampo, Tamaulipas, where they met the A&I cavers to explore Sótano de Vásquez. On their way out they drove the Bittinger VW bus over to Ayutla where our group would emerge from the mountains in a couple of days. Dr. Bittinger, Dave, Kirt, Bob, Victor, Barb, and I hiked across the mountains from La Florida to El Rancho Barro leaving Logan (who was sick) and Judy at the church. They would go down to Conca with the generator and meet us there in a few days. That night our group spent the night in the schoolhouse at El Rancho Barro after making arrangements for a guide to take us up to El Sótano the next morning.

El Sótano was certainly worth seeing even though we didn't have the time or the rope necessary to enter it. By mid-afternoon our guide had left us in the Río Ayutla canyon and told us it was only a few hours hike to Ayutla. We had a great time hiking until it got dark on us. Then

we found ourselves fording a fairly swift current in the river, quite lost. It was only by luck that we found the right trail and made it safely into Ayutla to the VW bus that night. Then we drove to Conca and camped.

The next morning we picked up Logan, Judy, and the generator in town and drove back to Valles. Barbara, Logan, and I stayed in the vicinity while Dr. Bittinger's group continued back to Texas with the La Florida generator which was later fixed and returned at great expense.

Eventually Pete Strickland, Paul Duncan, and Ronnie Fieseler arrived in their trucks with a hoard of cavers from Ocampo. On January 1, we all headed to Guajolote Corral to make the hike up to Cueva de Tanchipa. Where before we had to walk from the highway all the way to the mountain and then up to the cave, the trucks now carried us more than half of this distance making the hike much shorter. The first night, 16 cavers slept at the base camp in Tanchipa. The group included Paul Duncan, Craig Bittinger, Jim Clements, Ronnie Fieseler, Roy Jameson, Pete Strickland, Steve Bittinger, Logan McNatt, Frank Binney, Ted Wilson, Paul Johnson, Brian Boles, Tom Albert, Ernie Garza, Barbara Vinson, and myself. Unfortunately, the 600 ft of rope that Kenny and I had left two weeks earlier had been stolen. We carried up slightly over 700 ft of rope this trip which luckily proved to be enough.

On the first day of exploration, we split into three groups. The first group explored Sótano de los Coatimundis down to an estimated depth of 720 ft. Frank and Pete made it to the bottom over four knots, but it was not surveyed. The second entrance to Coatimundi was entered by Roy who estimated that it connected into the main shaft at the 250 ft level. This group explored several smaller pits in the area. The second group which included Ronnie, Paul Johnson, Paul Duncan, and Jim Clements started a new trail which headed east from Coatimundi. They chopped all day and finally located a steep-walled depression with a small cave at the bottom which they named Cueva de las Piedras Amarillas. The third group, which consisted of Craig, Ted, Barb, and I, hiked to the Star-shaped Depression and continued the trail toward the big pits. After only a few hundred feet of chopping we found the first pit, Sótano de la Estrella. We continued the trail in search of the second big pit, Sótano de la Cuesta, but missed it by several hundred feet as our directions were off. While we were spread out searching the jungle we found a small cave where the Indians had apparently mined calcite crystals from the walls. Inside were two old log ladders, and around the entrance they had built a stone wall which was still keeping debris from washing into the cave. This we named it Cueva de la Cerca. Down at the trucks that day someone broke into Pete's truck through a window, stealing a Nikon camera and a walkie talkie. It was probably the same Mexican who stole the rope from Tanchipa.

The next day Sótano de la Estrella was entered and mapped by Paul Duncan, Craig, Barb, Ted, Frank, Jim, and myself. The entrance drop was 201 ft. There were over a thousand feet of large decorated passage at the bottom which contained a skylight. A few hundred feet back down the trail, Sótano de la Pipa was descended to an estimated depth of 270 ft and sketched by Frank. The rest of the group had gone off down the trail to search for Sótano de la Cuesta which we had been unable to find the day before. Steve, Pete, Roy, Logan, and Tom spread out into the jungle in order to cover more area. Towards the end of the day, Tom Albert finally found the pit. Then the group connected a path from the pit back to the main trail. The pit was deep and black and rocks were timed at six seconds free drop.

Each day more people returned to the trucks and headed for Texas until on the fourth day only Peter's truck was left at the bottom of the mountain and there were ten cavers left at the Tanchipa base camp. That morning eight of us carried all of the rope and caving gear north down the range to Sótano de la Cuesta. The entrance was about 60 ft in diameter with a small natural bridge at one end. We rigged the rope off the back side of the natural bridge

through an opening about 8 ft across and 30 ft long. The drop was 572 ft of free rappel. Instead of belling out, 15 ft below the rig point the ceiling of the room we were rappelling into cut away for hundreds of feet in three directions. The room was over a thousand feet long and three hundred feet wide with several hundred feet of relief. Roy, Logan, and I began surveying at once upon reaching the bottom and divided it up into six sections or loops. We were assisted by Barb, Ted, Frank, Ernie, and Peter. The total depth of the cave was 712 ft. We finished surveying in the early morning hours, pulled out the ropes and returned to Tanchipa after a 20 hour trip. It was a long return hike that night through hungry army ants.

The next morning Steve and Tom, who had stayed in Tanchipa the day before, questioned us about the pit and then showed us two boa constrictors which Tom had caught simultaneously as they sunned near the chapel. One was quite viscous and everyone was amazed. After photographs were taken, they were released. Almost all of our food and water was gone, and we were quite ready to close our very successful expedition. After we got Peter's truck back to the highway, we stopped at Ponciana Arriaga to report the theft of our property to the authorities. They were concerned, but not able to help us much. Barb, Steve, Tom and I caught the bus back to Texas that night while the rest remained in Valles with more caving in mind.

This last Easter, we made an additional trip to the Chapel area. After an ill-fated photographic trip in the Montecillos System, Barbara Vinson, Richard Booth, Jan Lewis, Terry Raines, and I made a brief two day stop at Tanchipa. Barb, Rich, Terry, and I spent the night at the Tanchipa base camp and then the next morning we quickly hiked over to Sótano de la Estrella where we located and surveyed the skylight. On the return to the truck we killed a six foot Fer-de-lance that was in the trail near Tanchipa.

There is another trip to the Chapel area planned this summer with the objective of mapping Cueva de Tanchipa and pushing it past the 450-foot level. After this and some additional work is accomplished, there should be enough information compiled to publish a report on the caves of the Chapel area.

Date: February 1973

Destination: Yucatán

Reported by: William R. Halliday, M.D.

On the way to some serious speleoarchaeology in Belize reported elsewhere, Len and I had a quick look at caves, cenotes, and karst of Yucatán as encountered along the main tourist routes.

With only a single exception, everyone was most anxious to assist, everywhere we went. The exception was a tour guide at Uxmal, with whom I discussed visiting the Grutas de Xtacumbil-xunan near Bolonchen and who misled me to believe that it was far from habitation in hopeless jungle. Especially after picturing it on the cover of a recent 'Journal of Spelean History,' this was unfortunate.

The remainder of our reconnaissance was close to the Mérida-Valladolid road, highway 180. This includes the Chichén Itzá area, with the famous Cenote Sagrado and the pleasanter, little-known Cenote Xtoloc virtually across the highway from the Hotel Mayaland. A small square hole atop the Ossuary or High Priest's Tomb leads down to a vertical cave beneath the ruin; we resisted the temptation.

About 3 miles west of Chichén Itzá is the famous cave of Balankanche where a tour of a Mayan shrine is available at a reasonable price. But not permission to photograph and my Spanish was not good enough to find out why or how.

In Valladolid, Cenote Zaci proved to be the prettiest and one of the most cavernous cenotes we visited. Located in the northeastern part of town, a small admission charge was well worthwhile.

Around Chichén, the karstlands distinctly resembled the recharge area for the Mammoth Cave karst—with a scrub jungle superimposed—but we were unable to learn of other caves in the limited time available. Farther west, however, the tourist can hardly avoid the large signs saying: Cenote's Bar—right in the middle of the town of Libre Union. The bar is beside a deep, beautiful narrow-necked cenote which bells out beneath highway 180. At dusk, we could see bats circling below but the people at the bar assured us that explorers had found only the single chamber.

A sign by this cenote invites tourists to swim in the underground river of Cenote Xtojil, and at first we thought that this was the name of the one by the bar. It turned out, however, that Cenote Xtojil is about a mile east of the Yaxcaba road, two or three miles south of Libre Union. Partially developed as a tourist attraction, it is pretty but lacks a feeling of cavernousness and no current. If the cenote by the Cenote's Bar has a name, we were unable to learn it and currently list it as Cenote's Bar Cenote. A rather similar cenote is located about 1 km west of Libre Union, about 100 m N of highway 180, behind a low cement wall. It, too, seems to be temporarily nameless.

Lack of time caused us to miss Loltun Cave, which was most unfortunate as new roads are about to make it a tourist center. On the island of Cozumel, which hardly gets eight feet above high tide, we were mildly surprised to find the famous Chancanab Lagoon to be a tidal cenote and at least one small bay along the coast is clearly a breached cenote.

Date: 6-15 April 1973

Destination: Río San Gerónimo, Grutas de Juxtlahuaca, Guerrero

Persons: Terry Sayther, Ann Lucas, Tom Albert, Pat Asnes, Craig Bittinger, Steve Bittinger

The trip left Austin about 3:30 Friday afternoon and headed toward México City via the inland route. Little trouble was had crossing the border and after slightly touching one burro we arrived in México City around 8:00 Saturday morning. After an afternoon swim in the Balneario Las Estacas we arrived at the Río San Gerónimo. Walt Rosenthal appeared suddenly and left the next morning after developing a case of the turistas. We entered the cave's lower entrance and mapped 4,000 ft before floating out. On the trip out we encountered a group of Mexican cavers from GEM who inquired if we were the AMCS from Austin. After talking with them awhile they said that from the way we caved we could only be the AMCS. The next morning we entered the upper entrance, crossed the shaky suspension bridge; and 14,000 mapped feet and 16 hours later emerged from the lower entrance.

The following day was spent driving to the Grutas de Juxtlahuaca which we entered on Wednesday with Enrique our guide. The cave's peaceful beauty was enjoyed by all in the direct contrast with the wild rushing of the Río San Gerónimo. The group then proceeded to Acapulco where we enjoyed the turista trip and were awakened by a minor earthquake. We returned by way of Mexico City, Pinal de Amoles, the Xilitla bird house, and Kingsville. Austin crept over the horizon around 2 PM Sunday.

ARTICLES

1969 Mexico-Guatemala Cave Biology Field Trip Report

Stewart B. Peck and James H. Peck

From 18 June to 13 September 1969 we were involved in field work on the ecology, distribution, and evolutionary biology of *Ptomaphagus* and other "catopid" beetles, as well as in other general aspects of plant and animal biogeography, in Mexico and Guatemala. Our collecting methods used dung and carrion baited pitfall traps, the sifting of forest litter, and Tullgren funnel extraction of the fauna, and cave collecting. We offer the following summary of cave localities worked by us for the use of others interested in our itinerary and in advances in cave biology in Mexico and Guatemala. Epigeal field sites are not included. The report is a response to the need expressed in the numerous requests we have had for data on the sites we visited.

The report is organized chronologically from our field notes, and is often in a telegraphic style. Most of the localities were found by using Russell and Raines, 1967, AMCS Bull. 1: *Caves of the Inter-American Highway*. Consequently we will not give locations nor descriptions of caves found in that publication. Caves not in that or later AMCS or other publications will be here described and located in some detail.

We wish to thank Russell M. Norton for accompanying and assisting us from 18 June to 10 July; William Elliott and Don Broussard are thanked for allowing us to accompany them during their cave work on July 15, 18 and 19. We also want to thank Denis Koester, Russell Gurnee, José Storek, and Carlos Palacios for their various assistance in the Guatemala work.

Only scant information will be given on the fauna encountered on the trip. All the collections have been distributed to specialists, and much of the fauna has been summarized and characterized by Reddell in AMCS Bull. 1, or by Reddell and others in AMCS Bull. 4, and in other publications.

19 June. Cueva de Chorros de Agua, N.L. Extensive collections were made. Baited pitfall traps were set in the cave and outside. Two ricinuleids were found under rocks outside of the cave in the forest, near the springs.

20 June. Cueva de la Boca, N.L. It was still in operation as a mine, and open to visitors only on Sunday. We were allowed to collect this day only in the twilight zone and found Eucinetid beetles (not previously known from Mexico) and other insects in dry loose guano.

Coming down from the cave, about 83 m below the mouth, to the east of the trail, we found a small mine adit, which was flooded about 7 m inside. The water contained mosquito and beetle larvae as well as *Asellus* and another white isopod. This is the first known Mexican cave *Asellus* locality.

We drove to Huasteca Canyon, found the caves after some difficulty due to new roads and a drilling operation, but the 116° heat prompted a swim in the creek rather than collecting in the caves, and the thought that winter visits to Huasteca were more sensible than summer ones.

21 June. Grutas de San Bartolo, Huasteca Canyon, N.L. We made various collections in the north and south cave and estimated the flea density in the north cave to be 50 per sq ft of guano-covered floor.

Grutas de García, visited as tourists, and were presented with 90 minutes of huge formations and an Ave María recording.

22 June. Cueva de la Boca, N.L. Made extensive collections of the rich fauna, mostly associated with moist guano.

23 June. Collected in small caves at edge of Chipinque Mesa, above Monterrey, N.L. To reach Chipinque Mesa, start on Constitution Avenue in Monterrey, proceeding west to junction with Highway 40 at Eleuterio González road, turn left toward the mountain, noting “country club” sign. Follow this winding toll road (2.3 pesos per person, collected at mile 11) up to Chipinque Mesa at 1500 m.

Cave no. 1 was being used as a trash dump. It has an entrance 2 m by 3 m leading downward at a steep angle. The entrance is about 200 m from the restaurant at an azimuth of 130°, 50 m from the grass clearing, to the east under the steel pole-supported electric lines (sketch 1). The cave is a high narrow passage about 10 m long, and contained *Rhadine* and a blind *Mexaphaenops* carabid beetle.

Cave no. 2 is a short shelter cave under and behind one of the rental houses (rooms 3 and 4) (sketch 2), which make a nice place to stay. It has moist litter and a fauna with *Ptomaphagus* and *Rhadine*. The entrance is about 2 m wide and 1 m high and leads down steeply for about 5 m.

Cave no. 3 is located immediately behind room no. 9 in the long motel building, 2 m from the rear wall, and has an entrance 1 m by 1 m, leading down at a steep angle, with the total cave about 15 m. Beetles and spiders collected.

Cave no. 4 is located at an azimuth of 170° from Cave no. 3, down the slope, at the base of a 7 m limestone bluff. The 1 m by 3 m entrance leads up about 15 m. The cave was dry, with no fauna.

Recommendation: Chipinque Mesa warrants additional attention and exploration as a cave locality. The one cave carabid collection here suggests that there are bigger and better caves somewhere nearby.

24 June. Climbing to the top of the limestone ridge above Chipinque gives a fine view of the limestone valley to the south, with entrances visible.

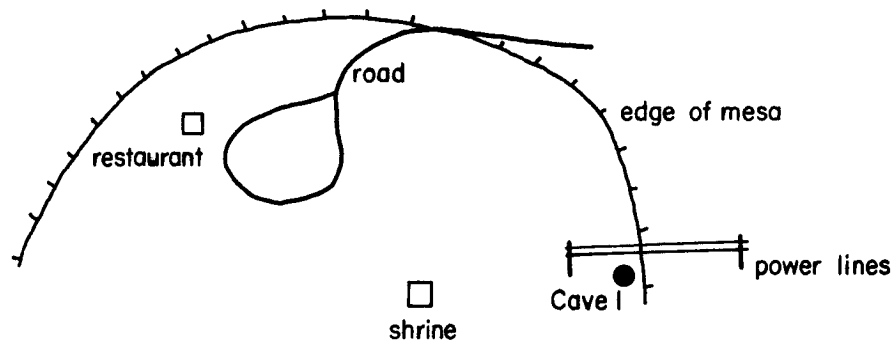
25 June. Cueva de Chorros de Agua. Picked up pitfall traps.

26 June. Looked for Sumidero de Pablillo at the village of Pablillo, finding AMCS directions inadequate, and finding no one in the village who heard of the sumidero.

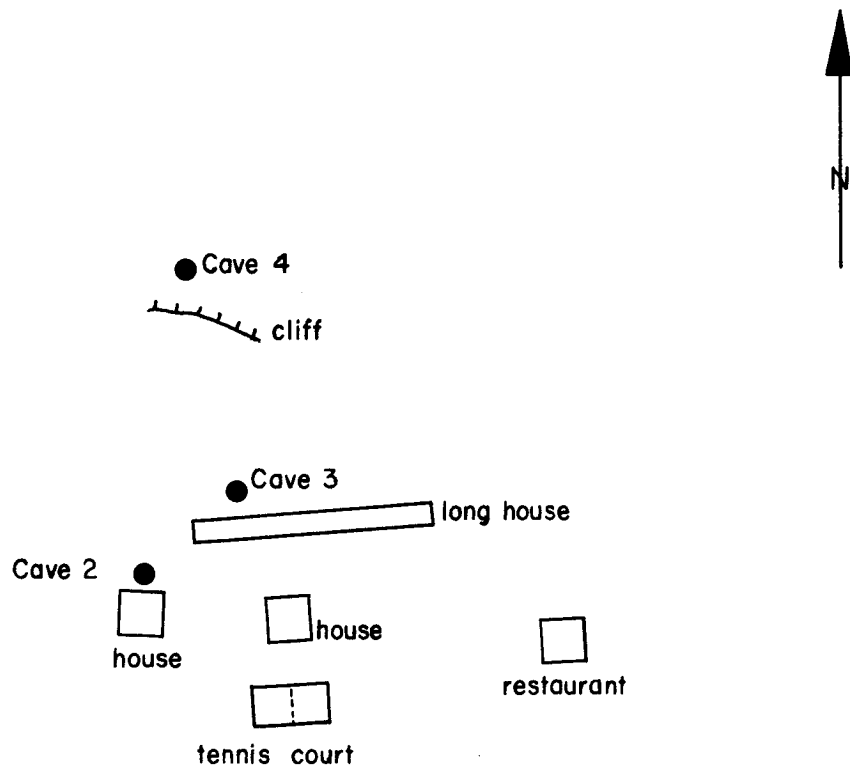
27 June. Looked over the limestone summit of 4000 m high Cerro Potosí. Microkarst was present but no large solution features were seen.

29 June. Cueva del Nacimiento del Río Frío. The “chest deep” river that must be crossed in order to reach the cave was in full flood, requiring a strong swim against the current to cross it. AMCS Bull. 1 is unclear on the roads needed to reach the river. The cave had a varied terrestrial fauna, and no life was seen in the rimstone pools.

30 June. We rented a guide and two burros in Gómez Farías, leaving our truck in the yard of Sr. Félix Burgos, and packed up to Rancho del Cielo, the cloud forest biology station of



SKETCH 1



SKETCH 2

Texas Southmost College, Brownsville, and were shown the locations of three caves here by Alfred Richardson and a Southmost student called Bill or Ole.

1 July. Cueva de la Mina. We were guided some 5 km to this cave at 1600 m by Bill. Collections were made and dung baits and traps placed in the cave and outside.

We noted a large, fairly complete skeleton of a mammal in the left-hand section of the cave, towards the center of the room, partially under a flowstone ledge, partially covered with flowstone and "grape" deposits. We couldn't tell if it was a carnivore or ungulate. The skull was stepped-on on one side and crushed. With a hammer and chisel the 8 in long skull could be broken loose and a determination made to judge its importance. Vertebrae, ribs, long bones, pelvis, etc., are present.

Crystal Cave, Rancho del Cielo. Made collections and set baited pitfall traps.

2-3 July. S. Peck and R. Norton walked some 13 km from Rancho del Cielo to Charco de la Perra (now called El Porvenir) while J. Peck stayed at Rancho del Cielo and continued collecting there. Peck and Norton were guided from La Perra by Paulino Sánchez "the mountaineer" and Sr. Manjárez (the district forester and El Maestro) to Cueva Capilla de la Perra, and Cueva Chica de la Perra.

Cueva Capilla has a large sink entrance, going down a 25 m slope to a chamber, up a flowstone in back, to top of a mound, down and up again into a huge decorated chamber with a central flat mud area. This cave and its rich fauna gave us the most rewarding feelings we had experienced of exploration and collecting.

Cueva Chica is not much farther beyond, with about 170 m of cave, and three entrances. The fauna was poor in comparison with Capilla, but troglobitic beetles were present in Neotoma dung.

Cueva de la Mina was revisited and the baits and traps checked. One of the blind scorpions was taken.

4 July. Salamander Cave, Rancho del Cielo, due east of the cook shed, 75 paces beyond the fence, to N of trail about 13 m. The cave is a chamber with a skylight, and holes going down. Fauna was poor but present. Traps were taken up in Crystal Cave.

6 July. Grutas de Quintero, Quintero, Tamps. The cave was being actively mined for phosphate. Extensive arthropod collections were made of known and new species of the rich fauna here. It was interesting to collect 138 *Ptomaphagus* beetles in the toe of a shoe at the end of the cave. The shoe toe was cleanly severed from the rest of the shoe, leading us to wonder if it had been the result of a mining accident, and if the beetles were congregating as a result of an attraction exerted by some misplaced miner tissues.

7 July. Cueva del Abra, Tamps. Only a few troglophilic beetles were found, and we did not descend the pit.

8 July. Heavy rains and deep mud prevented us from reaching caves at Nacimiento del Río Mante.

9 July. Grutas de Quintero. Got stuck in deep mud on road to cave. Recent heavy rains filled the formerly dry travertine dams, and the mysid and cirolanid lake level had raised by about 24 in, with water flowing from a hole in a flowstone about 1 m above the floor at a rate of about one gallon per 5 seconds. We took live crustaceans in an attempt to have Rusty Norton take them back alive to Yale for laboratory studies.

10 July. Cueva del Pachón, Tamps. We had difficulty finding this due to incomplete directions in AMCS Bull. 1. We made extensive invertebrate collections and marvelled at the concentrations of fish.

11 July. Cueva de Taninul no. 4, S.L.P. Phosphate mining here has exposed an interes-

ting series of sediments and fills. For instance, some tunnels have been dug under the breakdown under the large northwest skylight. These tunnels show a thick deposit of very black "soil" which might well represent an old guano deposit formed in the chamber before the ceiling fell in. No fossil vertebrate material was seen but it is worth some time here searching. A fair invertebrate collection was made.

Cueva de Valdosa, S.L.P. The miner working here said it was called La Cueva or La Mina de la Ultima Tirón. We did not follow this to the end where Reddell and others had made biological collections.

13 July. Cueva Ventana Jabalf, S.L.P. Cave floor has been drastically altered from previous descriptions due to phosphate mining. Numerous deep solution canyons are exposed in the floor, possibly dating from when the cave passed from a phreatic to a vadose solution phase. We found a rich fauna, which is essentially that which Reddell reports (AMCS Bull. 1). While in the cave a rain came up, dissolving the thixotropic mud of the road, so that we were stuck in the mud 26 hours without food or water.

15 July. Sótano de las Piedras, S.L.P. It would be interesting to collect in the semi-moist forest in the sink at the entrance of this cave. While Elliott's crew collected fish, netting some 50, we made fair arthropod collections.

16 July. Driving from Cd. Valles on road 85 (0.0 mi) we searched for forests, entering Hidalgo at mile 77.6, the village of Santa Ana at mile 91.4 and a cave on the left side of the road at mile 95.9 (between km 303 and km 304, between Palo Semita and El Ocote). The cave is about 25 m long, with two small chambers. We collected spiders, an *Agonum*, isopods and collembola on rat dung.

17 July. Laguna Colorado, W of Xilitla, S.L.P. We searched in the karst here, but found no caves.

Chevron Cave, Qro., about 110 km W of Xilitla. The cave, exposed in a road cut, has little organic input. Only one staph, one spider, and some moths were found on guano.

Small mine, only 1 km W of Chevron Cave, 2 km E of Pinal de Amoles. This looks as if it might have been a limonite mine, with a hand-dug set of low tunnels, maybe 67 m long. At the end on and near a moist spot with rat dung, a rich troglobitic fauna was found of beetles, millipeds, spiders, etc.

18 July. Cueva del Nacimiento del Río Choy. We collected epigean fish, accompanying Elliott, as well as an assemblage of ordinary troglomorphic arthropods. Another entrance to this cave exists up the cliff, above the railroad tracks, which is used as a shrine to the Virgin, represented by a painted formation.

19 July. Cueva de la Porra, Tlamaya, 5 km N of Xilitla, S.L.P. Good and varied collections were made, including *Eodrilus oligochaetes*.

20 July. Cueva del Salitre, Xilitla. Little fauna was found in the floor of the twilight-zoned left tunnel. To the right in the dark chamber a fair faunal mixture was found, including *Eodrilus oligochaetes* in pools in a small low room which can be crawled into at floor level from the right wall of the twilight zone region.

Cueva del Nacimiento del Río Huichihuayán. We took a "ferry" canoe across the river at town and walked 3 km S along the main dirt track to the Nacimiento. On the ridge above is a 7 m shaft and other breakdown holes. We found no trace of a passage going deeper into the cave, beyond the large breakdown-filled entrance room. Fauna was poor.

21 July. Cueva Chica, 18 km S of Valles. An estimated 200 fish were seen in the first pool, and various invertebrates collected.

6 August. Cueva de Atoyac, Atoyac, Ver. The cave description matches that in AMCS

Newsletter 1(8):74, but better directions on reaching the cave should be given. A good sample of fauna was collected and traps were set in the cave.

7 August. Cueva de Ojo de Agua Grande, Paraje Nuevo, Ver. Locally asking for this led us to a settlement. When it was clear we wanted a cave, we were directed to the nacimiento. I believe we were at the cave reported by Fish and Reddell (AMCS Newsletter 1(8):75) which they believed to be not the crayfish type locality they were seeking, but we believe it is the correct cave. Clear and precise directions to the cave should be published. Fair collections were made, but not of the crayfish. The cave river presented the most bodacious sight of a set of rapids we have yet seen in a cave. The most interesting collection was blind *Cyathura* (Anthuridae) isopods, the first known material from a Mexican cave, later described as *C. sbordonii* Argano.

8 August. Cueva de Ojo de Agua de Tlilapan, Tlilapan, Ver. We made fair collections here, but did not find any life in the pools at the back of the cave, nor any additional blind scorpions.

9 August. Cueva de Atoyac. Picked up baited traps in cave.

12 August. "Km 27 Cave" [=Cueva de las Pinas Ramas]. This is 33 m before km post 27 on route 190, E of Tuxtla Gutiérrez, Chis. The cave entrance is on the N side of the road, partially hidden by bushes, but visible when coming from the east, between Ocozocautla and Cintalapa, 6.7 km W of bridge across river at Campo los Flores. This is a small linear cave with only a poor fauna, and abundant potsherds.

13 August. Cueva Rancho Nuevo, exactly 10 road km E of San Cristóbal, Chis., from the corner with the Dominguez Center of Education, on the Inter-American Highway, not 5 km as reported in AMCS Newsletter 3 (6) : 124, and now located between km post 94 and km post 95, several hundred meters down a draw to the south. A good map of the cave has been made by Sr. Kromsky, who runs a photo shop in San Cristóbal, Av. 16 Sept. and Calle Diego. We went in the cave only some 335 m and found the fauna to be disappointingly sparse. Pitfall traps were set at the entrance and a slight bit inside the cave.

Other cave leads can be obtained from Sr. Kromsky and Sr. Armando Aguirre, Antropólogo, 1 N. 1 (La Cabaña).

Trudy Blom of Casa Na Bolom, in San Cristóbal outskirts, who conducts various anthropological projects with the local Indians, is another source of cave information. From her we bought a copy of a 1953 map of "La Selva Lacandona" which shows some locations of numerous caves, sumideros, etc.

Near Cueva Rancho Nuevo is supposedly a Cueva del Coyote "with much fauna" in the hills to the east, and a guide could be obtained at the nearby village of Chanal.

14 August. Parque Nacional de Lagunas de Montebello, Chis., E of Comitán. This is a region of abundant karst, with the lagunas being in some cases cenotes, huge and very beautiful.

15 August. Cueva de Arcotete, about 6 km E of San Cristóbal, Chis. We were guided on this 2.5 km horseback ride by Sr. Teo Martínez of Hotel Rancho Molino de la Alborada, renting horses from the ranch. In Tzotzil Indian the cave name is Alcotetle. The cave is in the ridge that lies to the north side of the Inter-American Highway, to the E of San Cristóbal. It is a heavily decorated cave, entered from a large sink 17 m across. To the west side the passage is a chamber lit by a skylight (sketch 3) and an entrance at the far end. To the north the floor slopes down to a flowstone at the bottom. Up on this flowstone is a slot entrance to the back chamber of the cave. This back chamber is about

23 m across, 33 m high, and 83 m long. It is totally floored with flowstone, breakdown, and/or guano. Most of the fauna was found on the guano-covered slope at the north and west side of the room.

16 August. Lagunas de Montebello. More searching here found nothing, but the sink-pocked pine-lands certainly reminded us of northern Florida. Checked the "sumideros" at Margaritas, E of Comitán, and found them to be large shallow lagunas.

17 August. Cueva del Sumidero San José del Arco. This cave is in the sumidero of the Río running into the Parque. From a parking lot at the end of the pavement a gravel road continues and eventually winds up slope and up a valley, ending in a quarry. To the east of this road is the valley containing the sumidero of the Laguna. From the small village on this road a trail goes slightly down and meets another in a ravine heading down to the sumidero. Heavy rains raised the river, almost filling the arch of the natural bridge, covering several trees below the bridge. One "entrance" was seen in the near wall of the sumidero sink. The cave we entered is along the trail to the right about 100 m before the river (sketch 4). The cave (sketch 5) was small, with little dark zone, and debris showed that it mostly floods in time of very high water. The fauna was sparse.

Cueva San Francisco, 19 km S of Comitán on the Inter-American Highway, is also called Cueva Trinitaria or Cueva Zapaluta. The huge entrance cliff is visible from the road. A creepy event occurred here. When we went in the cave the shrine was dark and no people were in sight. When we came out no people were in sight but the shrine was ablaze with abundant votive candles. Some interesting troglobites were taken, but much of the fauna is accidentals washed in with debris.

20 August. Gruta El Silvina, Izabal, Guatemala. The cave has been described and mapped by R. Gurnee (NSS Bull. 21, 1962) and lies between km 260 and km 261 on the road to Puerto Barrio. The entrance has been altered since 1962 after undergoing shelling by the military engaged in fighting guerrillas supposedly hiding in the cave. Good collections were made, and traps set.

21 August. Cueva de la Coche, Izabal, Guatemala. This is located by launch at river level about 2.5 km up the Río Dulce from Livingston, after taking a boat from Puerto Barrios to Livingston (1 hr 30 min). The cave is only about 83 m long, and is narrow throughout, with no side passages. Little fauna was found, and nothing was seen in the pools in the back of the cave.

Farther upriver is visible a large entrance on a bluff called Cueva de la Vaca. It is said to be unreachable by climbing from below, but did not look this way.

22 August. Picked up traps at Gruta El Silvino, and drove E to Río Doña María where we got verification of a cave in the mountains, 5 km to the north. There is a bridge a few km to the E in the vicinity of Cualán to cross and go north. The cave is supposedly large and promising, but Gurnee believes he was at this site but found it to be unrewarding.

Trying to cross the Chuacus Mountains put a two-finger hole in our gas tank. After patching it with a mixture of mud and hand soap, we were able to limp back to Guatemala City for repairs.

24 August. Cueva Seamay, Senahu, Alta Verapaz, Guatemala, on Finca Seamay. The cave is described by Gurnee (NSS News, no. 8, 1965) and in Explorers Club Journal, vol. 46, 1968). We made fine collections here.

25 August. Return visit to Cueva Seamay to set traps, and then on north a few km

to Finca Sepacuite. We were trying to track down the type locality of a *Ptomaphagus* beetle from "Cueva Sepacuite", and found three caves on the finca.

Cueva Sepacuite no. 1, which also has a name in Kekchi Indian which translates to La Peña de las Golondrinas. This was reached with an Indian guide by driving about 1.5 km N from the finca, and walking beside a cemetery, to the N up and across a wide solution valley and up a rock-paved road for about another 2 km. The cave is a huge shelter entrance about 100 m across, several hundred m up a forested slope from the trail. The cave has a vertical depth of about 50 m down breakdown, and a horizontal depth of about the same. The fauna was very poor.

26 August. Cueva Sepacuite no. 2, with a Kekchi Indian name translating to La Piedra de Cahabón. This was reached after a 1 hr 30 min swift walk up the valley due N of the finca. The entrance is on a slope of a milpa, with a sink entrance about 33 m wide at the cave mouth, widening to 67 m inside. The length is about 167 m, with a 33 m ceiling, with no side passages, only a huge elongated chamber, floored with massive breakdown, and dripstone. We judged this to be the cave in which the Italian MD, Giacinto Mira, studying malaria and sleeping sickness in the region, took the *Ptomaphagus* beetles named after him. We found the beetles and some other fauna, including blind amphipods.

Cueva Sepacuite no. 3, with a name translating to La Piedra de los Murciélagos. This is on the same trail as Cave no. 2, but 15 min walk closer to the finca. The cave is 13 m wide at the entrance, and 20 m deep, narrowing to the back, with smooth damp soil floor. Some fauna was found but it was all troglomorphic.

27 August. Picked up traps in Cueva Seamay.

29-30 August. Lanquin Cave, Lanquin, Alta Verapaz, Guatemala. The cave is "commercialized" and so we tried to make arrangements with the alcalde, but found him to be drunk and incoherent on this day, which was the fiesta of Lanquin. We then simply camped near the cave and worked it. It is described by Gurnee in NSS News 17 (9), 1959; NSS Bull. 24, 1962; and Explorers Journal 46 (3), 1968. The rich and interesting fauna was mostly associated with guano. White flatworms were abundant towards the back.

2 September. We looked over some of the high-elevation karst in the Cuchumatanes mountains above Huehuetenango but found no caves and returned to Mexico.

3 September. Picked up traps in Cueva San Francisco and Cueva Rancho Nuevo.

6 September. Grutas de Cacahuamilpa. We did not try to collect in the back chamber which Reddell has stated to be the only suitable place for fauna.

This concluded the cave field work south of the border, having made biological collections or observations in 45 caves. But at this time we still had another month of field work ahead of us in the western U.S., including caves in Arizona and Idaho before returning to Cambridge, Mass., and Harvard.



ASSOCIATION FOR
Mexican Cave Studies

NEWSLETTER

Volume IV Number 3

December 1973



NEWS AND NOTES

EDITORIAL

TRIP REPORTS

Sierra de Guatemala and Sierra de El Abra

Sierra de Guatemala and Sierra de El Abra

Cd. Valles

Rancho del Cielo

Aquismón and Xilitla

Oaxaca

Southeastern México and Yucatán

Eastern México

Sótano de la Joya de Salas

La Gruta del Precipicio

ARTICLES

La Gruta del Precipicio

Cueva de la Sierra Partida

RECENT PUBLICATIONS ON MEXICAN SPELEOLOGY

Abstracts

Reviews

The Association for Mexican Cave Studies
is a non-profit organization
whose goals are the
collection and dissemination
of information concerning
Mexican caves

The AMCS publishes a Newsletter
Bulletin and Cave Report Series
which are available
to any sincerely interested
conservation-minded person

The AMCS Newsletter
is published six issues per volume
as frequently as necessary
at a cost of \$4 US per volume.

Information concerning
the other publications
is available upon request

Potential contributors are urged
to submit articles for publication

The article may cover any phase
of Mexican speleology

Trip reports are requested
from all trips

Send all material to

James Reddell or William Elliott
Association for Mexican Cave Studies
Dept. of Biology, Texas Tech University
Lubbock, Texas 79409 USA

Publications Editor Terry W. Raines

Newsletter Editors William R. Elliott
James R. Reddell

Cave Files William H. Russell

Secretary-Treasurer Jan E. Lewis

Coordinating Biologist James R. Reddell

Graphics Consultant Chuck Bryan

Production Assistance Neal Morris

Barbara Vinson



THE SPELEO PRESS

Austin

=====

ASSOCIATION FOR
Mexican Cave Studies

=====

NEWSLETTER

Volume IV Number 3

December 1973



NEWS AND NOTES

EDITORIAL

TRIP REPORTS

Sierra de Guatemala and Sierra de El Abra
Sierra de Guatemala and Sierra de El Abra
Cd. Valles
Rancho del Cielo
Aquismón and Xilitla
Oaxaca
Southeastern México and Yucatán
Eastern México
Sótano de la Joya de Salas
La Gruta del Precipicio

ARTICLES

La Gruta del Precipicio
Cueva de la Sierra Partida

RECENT PUBLICATIONS ON MEXICAN SPELEOLOGY

Abstracts
Reviews

NEWS AND NOTES

The following list of the major explorations in the Eastern Hemisphere in 1972 has been received from Paul Courbon, Paris, France:

FRANCE: August, SSPPO (Pau) and SGCAF (Grenoble) reached the terminal siphon of CAMBOU DE LIARD (-908 m).

August, "Abîme Club Toulonnaise" found new extensions in CHOURUM DES AIGUILLES. Climblings of 505 m give a total depth of 980 m.

September, 3 individual cavers reached the bottom of GOUFFRE d'APHANICE (-504 m). At -155 m there was a free fall drop of 328 m. Exploration was made with jumars and 9 mm ropes.

October, 3 individual cavers reached the terminal siphon of SCIALET DE GENIEUX (-675 m). This cave has been discovered in May.

IRAN: Individual English cavers reached the terminal siphon of GHAR PARAU (-751 m).

ITALY: August, G.S. Monfalcone reached -513 m in ABISSO DELLA GENZIANELLA. The bottom of the cave was not reached.

Christmas, Commissione Grotte Goegan reached -735 m in ABISSO DAVANZO. They stopped before a lake.

Christmas, G.S. Bologna and G.S. Bagni di Lucca reached -522 m in BUCA GRANDE DI MONTE PELATO. They stopped before a meander.

MARROCO: August, Speleo Club de Bois (France) found new extensions in KEF TOGHOBEIT, the cavers stopping above a shaft (at -560 m).

SPAIN: August, Societe Speleologique de Bourgogne (France) reached -853 m in SUMIDERO DE CELLAGUA. The cavers stopped above a 15 m shaft.

SWISS: Christmas, an interclub expedition of SSS reached -565 in Bärenschacht. They stopped above a pitch.

January, total length of Hölloch reached 115 km.

YUGOSLAVIA: PD Zeleznicar Ljubljana reached -615 m in BREZNO POD GAMSOVO GLAVICO. They stopped before a tight meander.

USSR: In December, the total length of PESCHTSCHERA OPTIMITITSCHESKAJA reached 92 km.

The AMCS Newsletter needs your trip reports, articles, news, reviews, area maps, and cave maps. We can convert your color transparencies to black and white for publication and return them to you. If drafting a map is a hassle for you because of a lack of equipment, write us and tell us what the map is like. We will be able to ink a limited number of maps for those who can't.

The AMCS solicits your manuscripts for the Cave Report Series and the Bulletin. If you have ideas for a Cave Report Series or a Bulletin write or talk to the AMCS Publications Editor, Terry Raines. Recent Bulletins have been devoted to biology because nothing else has been available. The AMCS is eager to balance out its publications with more material for the caver and more geological, historical, or archeological material.

EDITORIAL

The Newsletter of the Association for Mexican Cave Studies has for several years struggled through dark times. Issues have come out rarely and in recent years have been of high technical quality but generally out-dated and lacking in the kind of material which the membership has wanted to see.

It is the goal of the present staff of the Newsletter to see that each issue is published regularly and that it contains as much current material as is supplied to us by AMCS members. We actively solicit articles, maps, photographs, and trip reports. But in order for these to be of general interest they should be as current as possible. No one really is excited to see a trip report on a cave trip to an area now visited by everyone in the AMCS. The first trip to an area is an exciting event to read about. It is no longer so interesting after the tenth trip. Trip reports should be sent to us immediately. We will accept handwritten copy on napkins if necessary.

In addition to current material the AMCS files contain many trip reports which have never found their way into print. Many of these are hopelessly outdated, but many contain information still not available to AMCS members. Maps and photographs have languished in the files for years. We intend, as space permits, to publish these old trip reports and maps. If you have old maps you want to see printed send them to us and we guarantee that they will be quickly published.

Above all, however, we intend to see that the AMCS Newsletter is issued every two months and that all current material is given precedence over older copy. There is no reason why the Newsletter cannot be made a vital part of the AMCS once again.

The staff of the AMCS has received an extraordinary amount of criticism by many members because of the concentration on the biology of Mexican caves. These same members, who have assaulted us day after day with criticism, have failed to supply anything else to be printed during this period. Cave Report Series have not been written, trip reports have not been prepared, maps have not been drafted. This issue of the Newsletter consists largely of trip reports written by biologists about trips primarily for biological collecting. Still they contain information about the caves visited and include maps of several caves. This is unfortunate, not because the current issue is about biology (it is not), but because only two AMCS members who are not biologists (Amador Cantú, Jr., and Mike Walsh) have supplied us with copy. For the Newsletter to be a success we must have the support of all of the membership of the AMCS. Many people have complained about the AMCS Newsletter. They are being given their chance to support it—in effect they have the opportunity to make of it whatever they want. It is up to the membership to produce an outstanding, current publication or to let it die for lack of support.

—James Reddell

TRIP REPORTS

Persons: Francis Abernethy, Robert W. Mitchell, James Reddell, Pierre Strinati

Date: 1-7 June 1967

Destination: Sierra de Guatemala and Sierra de El Abra, Tamaulipas and San Luis Potosí

Reported by: James Reddell

1 June: Dr. Pierre Strinati of Geneva, Switzerland, flew to Lubbock with the intention of visiting biologically interesting caves in Texas and México. He was met by Dr. Robert Mitchell and they drove to San Antonio where Dr. Francis Abernethy of Nacogdoches and I met them.

2 June: We drove all night, arriving in Brownsville at 7:30 a.m. in a driving rainstorm. We drove on to Rancho del Cielo in the Sierra de Guatemala. There we found Mr. and Mrs. John Hunter and talked with them for about two hours.

3 June: We collected on the surface before driving up to Cueva de la Mina. This interesting and attractive cave contained salamanders, frogs, isopods, millipeds, and a single blind Trechini (later lost). Cueva de la Mina is the largest cave in the vicinity of the ranch and contains large formations, flowstone, pools, and travertine dams. From here we drove back to Rancho del Cielo where we ate supper with the Hunters.

4 June: We drove to San José from the ranch and from here we were guided to Cueva de El Infiernillo (see AMCS Bulletin 1, p. 52). We made collections here and then were guided on to a new cave which is named Cueva del Remolino. This cave is more interesting than Cueva de El Infiernillo. The entrance is smaller and so it is sometimes called the "cueva chica." We explored about 300 m of large walking passage and did not make a careful exploration in any sense. The cave is floored with massive breakdown and deep crevices drop down to lower passages and mazes under the breakdown. A careful map and exploration of the cave is badly needed. After leaving this cave we drove on south to Valles.

5 June: We first went to Cueva de Taninul n. 1 where we explored a 7 m deep crevice not previously entered. It went nowhere but Dr. Strinati was interested to see the vast number of ricinuleids in the cave. After leaving here we drove south to Cueva Chica where we made collections of invertebrates and of blind fish.

6 June: We began the return trip, but first stopped at Cueva de El Pachón to see the blind fish and then in Grutas de Quintero to see cirolanid isopods and mysidaceans.

7 June: We drove back to Austin where Dr. Abernethy and I were left. Mitchell and Strinati then returned to Lubbock by way of various Texas caves.

Persons: John George, Robert Mitchell, James Reddell, Francis Rose

Date: 25 January to 3 February 1968

Destination: Sierra de Guatemala and Sierra de El Abra, Tamaulipas and San Luis Potosí

Reported by: James Reddell

25 January: We left Lubbock about 6:00 p.m. and drove all night with car trouble developing by the time we reached Brownsville.

26 January: A new engine had to be put in the car so we spent all day in Brownsville. We spent the night at the home of Mr. and Mrs. John Hunter. Mr. Hunter is the business director of Rancho del Cielo.

27 January: We left Brownsville about 3:00 p.m. and drove directly to Rancho del Cielo, Tamaulipas, arriving at about 9:20. After having coffee with a group of students from Southmost College we drove up to Cueva de la Mina in the rain. Cueva de la Mina is a very attractive cave about 33 m deep and a hundred meters long. It contains many beautiful and completely unvandalized formations. Its primary interest to us, however, lay in its unique fauna. This fauna includes blind scorpions, beetles, pseudoscorpions, etc. We found the cave to be very cold and unusually unproductive in animal life. We did collect several frogs inside the entrance room. Other fauna included large spiders in the Scorpion Room, and spiders, snails, isopods, millipeds, etc., in the main room of the cave. After about two hours of collecting we drove back to the ranch and spent the night at Mr. Hunter's cabin.

28 January: We drove in a light rain and fog to El Porvenir (formerly La Perra) where we had heard of a cave in the vicinity of Agua Linda. We were directed to Cueva de la Capilla (also known as Cueva de la Perra). The cave entrance is located in a highly karsted area on a hillside and about 15 m above the road. The entrance itself is about 7 m high and 10 m wide and a steep breakdown slope leads down into a large room. To the right an alcove leads back about 35 m while to the left a slope leads up over breakdown and into a passage about 7 m wide and ranging in height from 1 or 2 m to 7 m. After 65 m a steep slope drops down over flowstone for about 12 m into a room 33 m wide, 20 m high, and 15 m long with a flat dirt floor. A steep slope up over breakdown and flowstone leads an additional 130 m before exploration was stopped. The cave has many formations and is generally very attractive and unvandalized. It is not known if it continues much beyond the point of our exploration, but it gets small. The total length of the cave is about 335 m. Few animals were present before the flowstone slope, but at the bottom of the slope there were found blind beetles of the tribe Trechini representing a new species; planaria, isopods, dytiscid beetles, and earthworms were found in a small pool. A few millipeds, eyeless crickets, snails, bats, centipeds, spiders, and collembolans were also collected. From here we drove back down to Rancho del Cielo.

29 January: We drove down to Chamal and to the ranch of Mr. Glenn Taylor. He directed us to a guide who took us to Bee Cave (see AMCS Bulletin 1, p. 53). We rigged the entrance and promptly taught Drs. George and Rose how to rappel. They did very well so we got into the cave in good time. At the bottom we went directly to the fish pool and, while Rose, George, and Mitchell hunted fish I collected invertebrates on the mud slope over the fish pool. I found a new genus of millipede, the second species (undescribed) of the genus *Mexicambala*, and other invertebrates. Dr. Mitchell caught blind isopods and mysidaceans as well as several fish. Since we only had two sets of ascenders it took us longer than it should have to leave the cave and we did not get back to the ranch house until after dark. We spent the night under a car-shed on Mr. Taylor's ranch.

30 January: After a hearty breakfast fed to us by Mrs. Taylor we drove south to El

Venadito, after a stop at Grutas de Quintero on the way. We found Quintero being heavily mined and several deep shafts dug in the floor of the cave. A huge hole had also been excavated immediately above the large lake. We collected mysids, cirolanids, and beetles in this cave. At El Venadito we obtained a guide to the Sótano de El Venadito. Dr. Mitchell descended the entrance pit and spent a short time searching for lost camera gear reported to have been dropped in the cave. He found the rimstone pool too deep to free dive so, since time was very short, we left without going deeper into the cave. We drove on to Valles and spent the night in the Hotel Casa Grande.

31 January: While Mitchell and Rose went to the Sótano de Pichijumo and Sotanito de Montecillos George and I went to Cueva Chica, where we seined blind fish for use in oxygen consumption studies by Drs. Rose and Mitchell. After leaving Cueva Chica we went to the Río Tamuín where we were joined by 15 naked boys who “helped” us seined fish. Dr. Rose and Dr. Mitchell entered both the Sótano de Pichijumo and the Sotanito de Montecillos where they collected blind fish. They did not go beyond the first fish pools in either cave.

1 February: We drove to Los Sabinos in the morning where we encountered Mike and Lynn Collins, Jerry Broadus, and Joe Cepeda. While Dr. Rose and Dr. George seined surface fish in streams north of Valles, Mitchell and I joined forces with the UT crew and went to Sótano del Tigre. This was a very pleasant and impressive trip into the cave. Mitchell and I went directly to the Ricinulid Passage where we collected about 200 ricinuleids alive and made general collections of other fauna. We returned to the entrance and joined the UT crew who had been mapping and we all exited together.

2 February: We left Valles and drove north to El Pachón, where we entered Cueva de El Pachón and collected fish and schizomids. From here we drove back to Brownsville, arriving about midnight.

3 February: After an all night drive we got into Lubbock about 3:00 p.m.

Persons: Bart Cook, Suzanne Fowler, Fred Howell, R.W. Mitchell, Cecil Parker, James Reddell, Ginny Tipton, and Gary Tucker

Date: 7-15 March 1969

Destination: Cd. Valles, San Luis Potosí

Reported by: James Reddell

7 March: Dr. Robert W. Mitchell and his class in Arachnology left Lubbock at 6:30 p.m. and drove all night, delayed only by hitting a deer and putting out a headlight.

8 March: We arrived at Brownsville for breakfast, delayed there by the jeep pulling loose and hitting a car in the café parking lot. Drove on into México and arrived at Gómez Farfás about 6:00 p.m. We loaded up the jeep and with Mitchell, Fowler, and Howell aboard took off, the rest of us walking. They drove on to Rancho del Cielo and then came back for the rest of us.

9 March: We collected on the surface on the way to Cueva de la Mina. We then collected in Cueva de la Mina for several hours. Collecting was excellent and we found a new species of troglobitic pseudoscorpion, cirolanid isopods (the first collection from a high altitude cave), and the first troglobitic planarian from México. We then returned to the ranch and spent the night there.

10 March: We left the ranch about 10:00 a.m., but since one of our members became lost in a dense fog and was not found until 4:00 p.m. we had time to visit only the sink-

hole immediately beyond the turnoff to Rancho del Cielo from the main Gómez Farfás road. Lack of equipment prevented its full exploration but it is over 30 m deep. We camped at the Nacimiento del Río Frío.

11 March: We visited Cueva del Nacimiento del Río Frío and made a nice collection of amblypygids and spiders of the genus *Ctenus*. In the arroyo below the cave we collected a surface species of ricinuleid. Spent the night at the entrance to Cueva de la Florida, making a quick trip in before we went to bed.

12 March: We spent several hours in Cueva de la Florida collecting ticks, schizomids, ricinuleids, spiders, etc., with considerable success. On the way out that afternoon we stopped by Cueva de El Pachón where our collections included a new genus and species of milliped of the family Trichopolydesmidae. This is one of the few troglobites known from the Sierra de El Abra so it is an outstanding find. We spent the night in the Hotel Condesa.

13 March: We spent several hours in Sótano de la Tinaja where we collected many schizomids, opilionids, etc.

14 March: We drove back to Alice where we spent the night at Richard Albert's home.

15 March: We drive in rain to Boerne where we collect rare palpigrades for four hours, then drive on to Lubbock in rain and heavy snow.

16 March: We arrived in Lubbock in a heavy snowstorm about 6:00 a.m.

Persons: Ann Barton, Mel Brownfield, Jerry Cooke, William Elliott, Masaharu Kawakatsu, Robert Mitchell, James Reddell, William Russell, Ginny Tipton, Suzanne Wiley

Date: 9-16 January 1971

Destination: Rancho del Cielo, Sierra de Guatemala, Tamaulipas

Reported by: William Elliott

9 January: Elliott, who had spent the previous week in the Sierra de El Abra with Jim Shepperd, met the rest of the crew as they arrived from the States at Gómez Farfás. Dr. Kawakatsu, a Japanese cave flatworm specialist, was our distinguished guest this trip. We reached Rancho del Cielo after dark and set up shop in John Hunter's cabin.

10 January: Most of the day was spent mapping and collecting in Cueva de la Mina (see map). This highly decorated cave contains many species of troglobites. Eyeless flatworms were collected for Mitchell and Kawakatsu's work.

11 January: We drove up to the town of El Porvenir and to Cueva de la Capilla nearby. This is the largest cave in the Rancho del Cielo area (see map). The day was spent surveying the cave, photographing cave animals and the large, terminal room, and chopping a trail down the slope from the small entrance to a nearby lumbering road. The vastness of the big room and the extreme amount of flowstone, along with the variety of interesting animals, made for a very interesting day. We collected diving beetles with reduced eyes, flatworms, aquatic earthworms, and other animals. A large, terrestrial flatworm was seen near the small entrance. Back at the cabin that night, some of us drafted cave maps or photographed flatworms while the others mapped nearby Crystal Cave (see map).

12 January: We mapped Harrison Sinkhole, which is immediately behind Hunter's cabin. A variety of arthropods was collected in the litter at the bottom of the entrance shaft (see map). Reddell, Wiley and some of the others tried to locate Cueva del Rancho del Cielo n. 7 but were unsuccessful. Mitchell and Barton drove Kawakatsu to Tampico so that he could catch his plane back to Sapporo, Japan.

13 January: We returned to El Porvenir and to Cueva de la Capilla, where we made additions to the now drafted map. Following the lumbering road and then a trail up the hill from Capilla, we found Cueva Chica de la Perra. Unfortunately we didn't have time to map this one, which has five entrances and is perhaps 100 m or more long. We collected two *Plecotus mexicanus* bats, which turned out to be a range extension for the species. South of El Porvenir we found the small Sótano de El Porvenir on the right side of the road. Elliott entered it and surveyed the bottom. Upon exiting, we found that Elliott's truck had two flats. Luckily, we found some lumbermen in El Porvenir who repaired them with the most primitive of tools. We spent the night outside Cueva de la Capilla.

14 January: Further exploration and photography in Cueva de la Capilla. Across the nearby lumbering road and down in a ravine, we found the large entrance to Cueva de las Perlas (see map). We mapped this cave in very little time and found more flatworms. On the way back to Rancho del Cielo at night, Elliott's truck had a violent blowout which reverberated through the cloud forest. We returned later with a spare tire from another truck.

15 January: After having another flat on the road down to Gómez Farfás, we finally split up, Mitchell et al. returning to Lubbock, and Elliott, Reddell, and Russell continuing on to Grutas de Quintero to collect isopods for Elliott's thesis work. In Mante Elliott purchased a recapped General Popo, which became the best tire on his rig.

16 January: Drove to San Antonio, where Reddell and Russell picked up their car and returned to Austin. Elliott continued on to Lubbock, pulling Mitchell's jeep behind him. After losing a universal joint on the way, Elliott limped into Lubbock the next day in front wheel drive.

Persons: Miles Abernathy, Jan Lewis, Ann Lucas, James Reddell, Terry Raines, Jack White

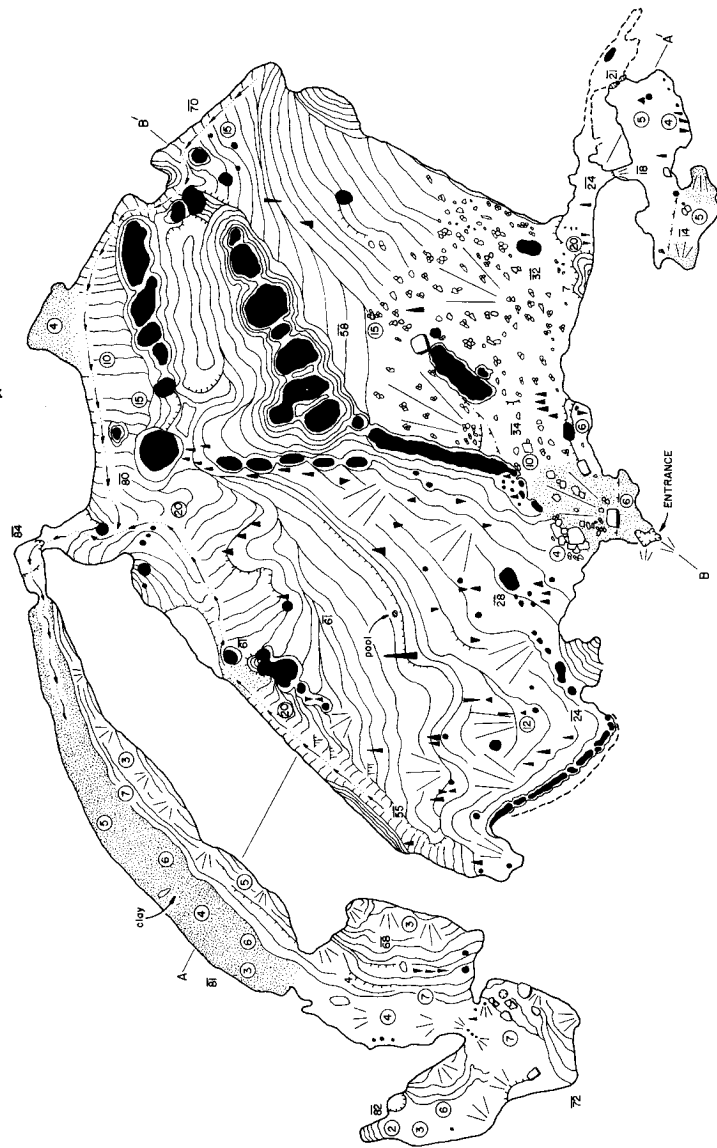
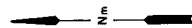
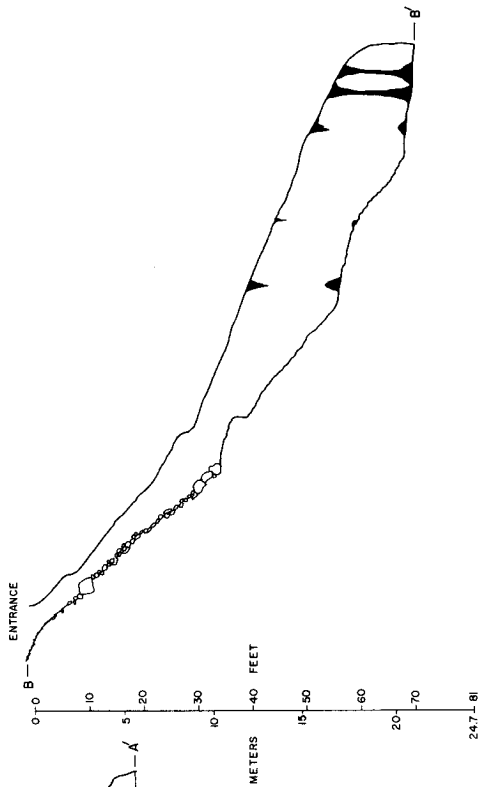
Date: 21-29 November 1972

Destination: Aquismón and Xilitla, San Luis Potosí

Reported by: James Reddell

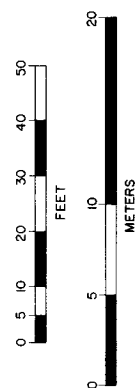
We left Austin in Jack White's van and drove to near Victoria before sleeping for a few hours. From here we went to Sótano (=Cueva) de San Rafael de los Castros. This small but interesting cave was mapped and a small collection made in it. We then drove to Grutas de Quintero and slept in the cave to avoid the rain.

The morning of November 23rd we drove to Aquismón where we encountered two car loads of cavers from San Antonio, Houston, and San Marcos. About 1:30 p.m. we began the long hike to Sótano de las Golondrinas. Jack wanted to make a study of the plant life at the bottom of the pit, Terry wanted to measure the entrance drop with the French surveying string, and I wanted to make surface collections and visit some of the other caves in the area. The hike was pleasant, if tiring, and we arrived about 6:00. Here I found that I had been adopted by a 9 year old Indian boy, Eraclio González, who had apparently run away from home to join the spelunkers. Besides sharing my food and sleeping bag (muddy clothes and all) he was an invaluable help in collecting and found most of the interesting bugs which were found on the trip. The night was made miserable by a steady drizzle and no real shelter. The next morning Jack entered the pit and made a good collection of plants and invertebrates. In the afternoon we crashed through the brush and spectacular karst above Golondrinas looking for a pit Bill Russell had directed me too, Sótano de Guadalupe. We finally found it, but an enormous ant colony had taken up residence at



LA CUEVA DE LA MINA

Municipio de Gómez Farías, Tamps., Mexico
 Brunton transit and tape survey, 10 January, 1971,
 by Ann Barton, Neil Brownfield, Jerry Cooke, William
 Elliott, Robert Mitchell, William Russell, Virginia
 Tipson and Suzanne Wiley, Dredged by William Elliott.



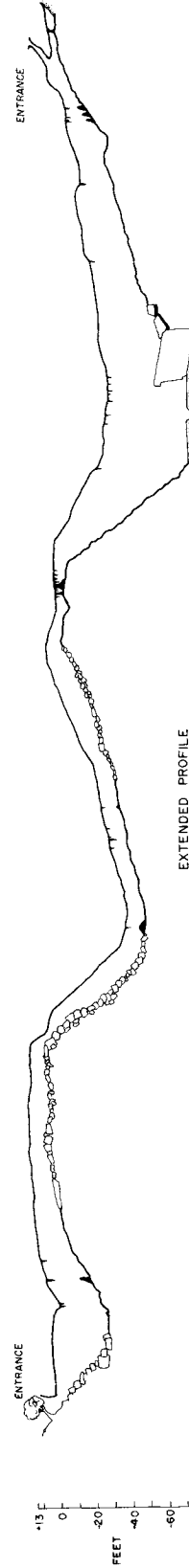
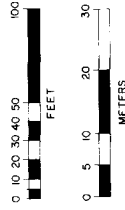


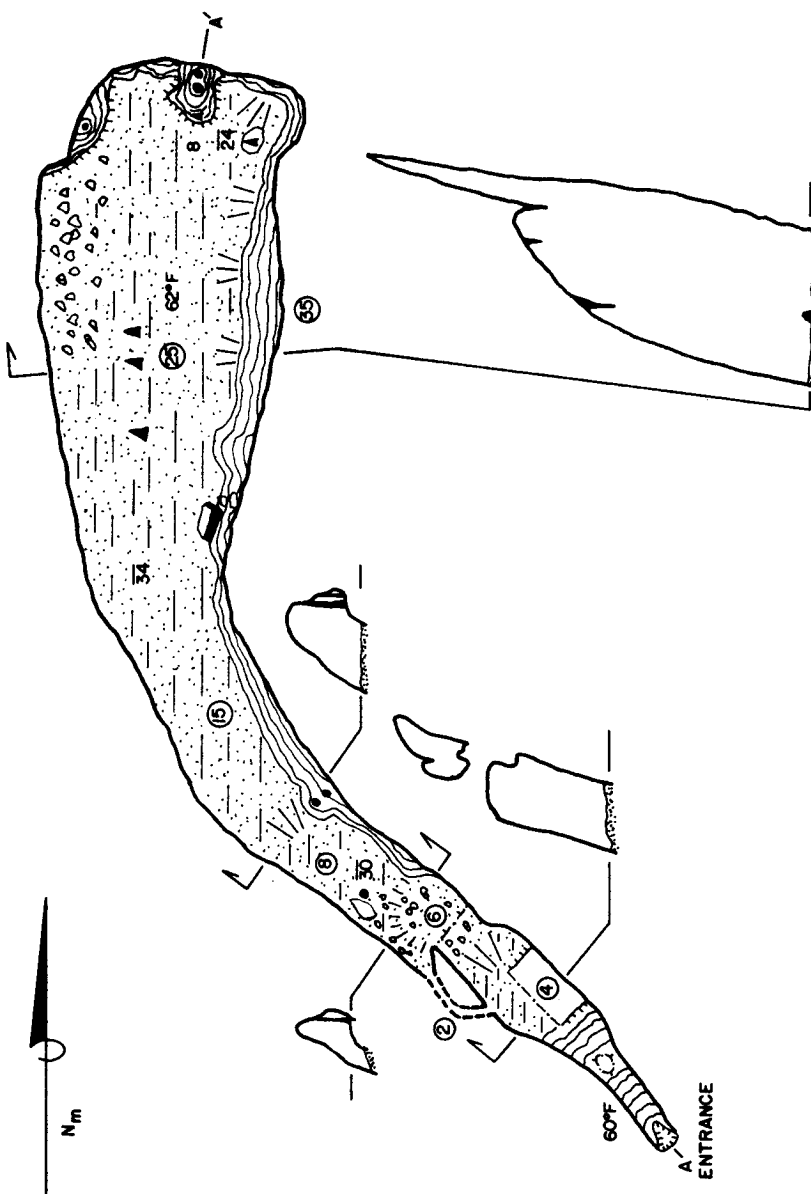
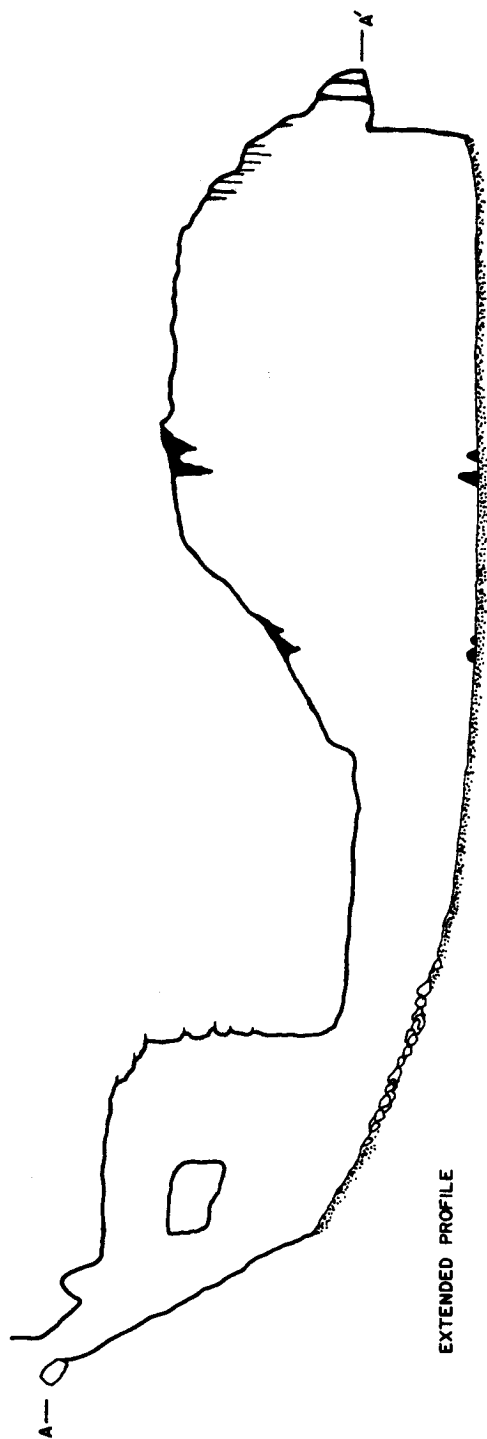
ENTRANCE TO LA. CUEVA DE LAS PERLAS



LA CUEVA DE LA CAPILLA

Municipio de Jaumave, Tamaulipas, Mexico
Brunton transit and tape survey, 11 January, 1971
by Jerry Cooke, William Elliott, James Reddell,
William Russell, Virginia Tipton, and Suzanne Wiley
Drafted by William Elliott





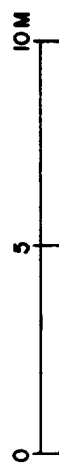
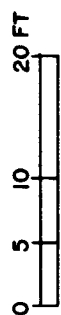
CRYSTAL CAVE

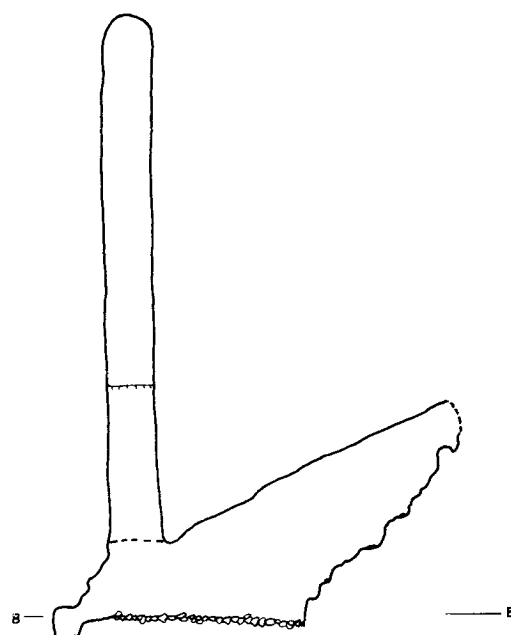
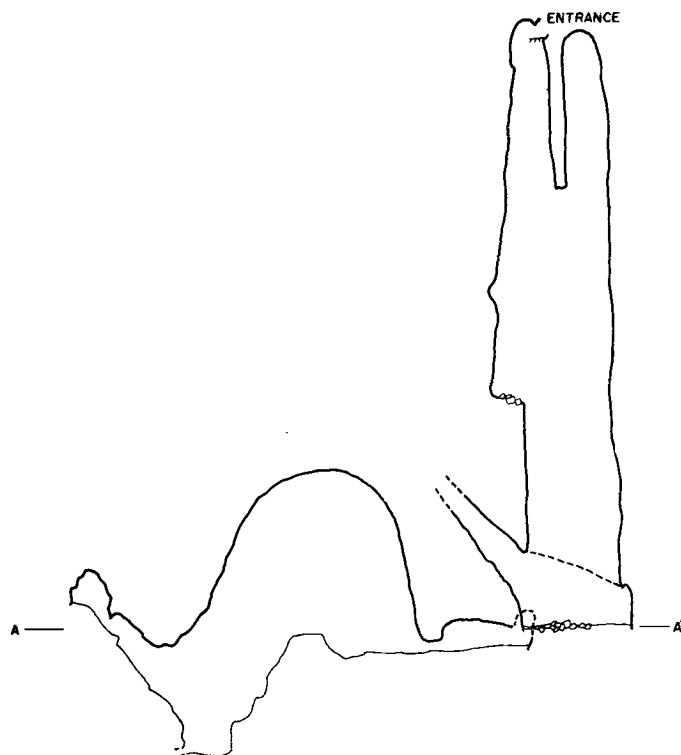
Municipio de Gómez Farías, Tamps.

Brunton and tape survey, 11 Jan. 1971

by J. Cooke, J. Reddell, W. Russell,

and S. Wiley. Drafted by W. Elliott





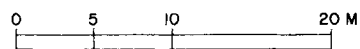
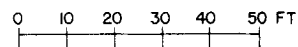
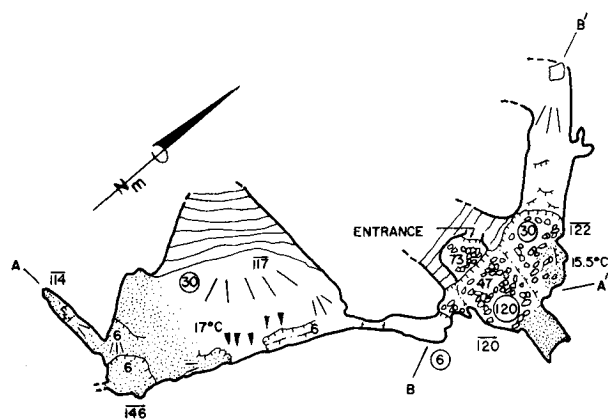
HARRISON SINKHOLE

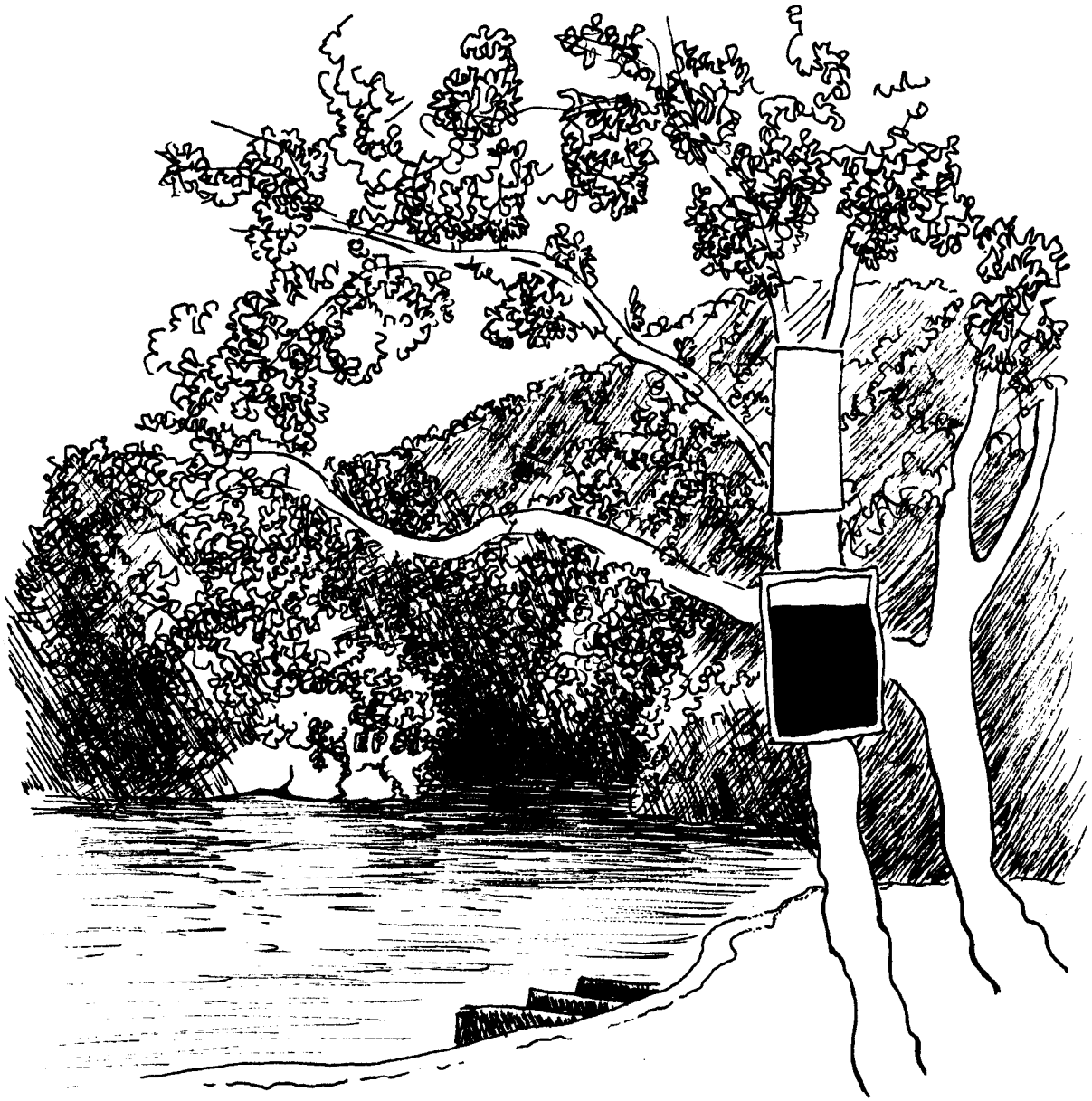
Municipio de Gómez Farías, Tamps.

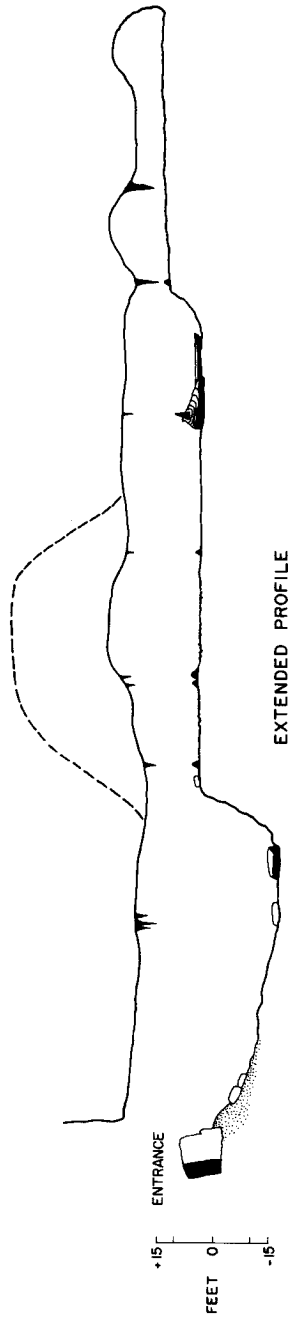
Brunton and tape survey, 12 January 1971,

by M. Brownfield, J. Cooke, and W. Elliott.

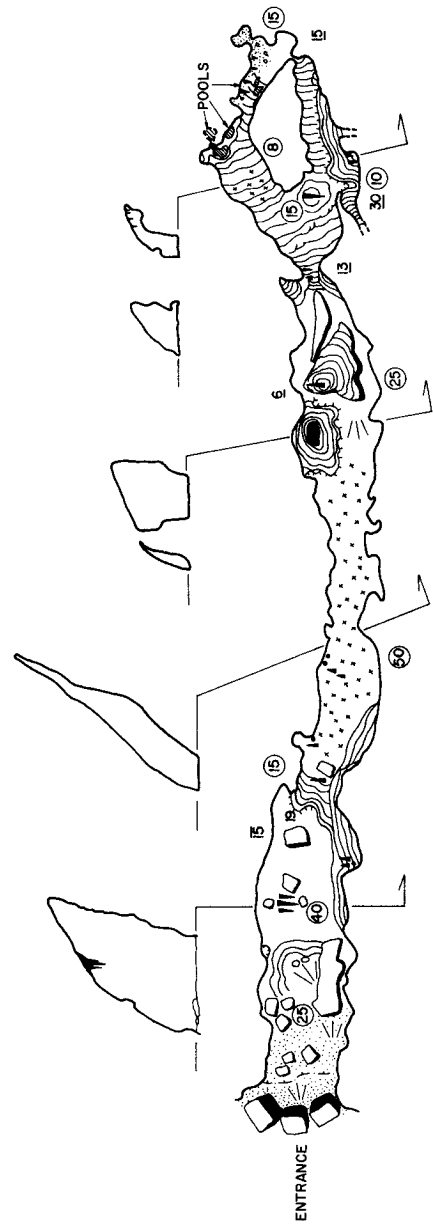
Drafted by W. Elliott.







LA CUEVA DE LAS PERLAS
 Municipio de Jaumave, Tamaulipas, Mexico
 Brunton transit and tape survey, 14 January, 1971,
 by Jerry Cooke, William Elliott, Robert Mitchell,
 James Reddell, and Virginia Tipton
 Drafted by William Elliott



the entrance and were in the process of filling the cave as well. They attacked vigorously and unceasingly and only Terry could ignore them enough to make a flying trip through the cave. Since it had a 15 m entrance drop and since the rope quickly became covered with ants this was definitely above and beyond the call of duty. But Terry managed to get a small collection of insects, millipeds, and flatworms. It rained again that night and continued to be cold and miserable the next day so we walked back down to Aquismón. We drove into Valles for supper and joined a huge mob at the Los Sabinos campground.

The morning of November 26th Jan, Miles, and Ann left us to return to Austin. We drove on above Xilitla and took the Xilitilla turnoff and drove to the cave at the end of the road. This cave was used by Pemex to obtain water for a test well they were drilling high in the mountains. It had previously been visited by Ronnie Fieseler who called it Cueva de la Bomba. It is now called by some local people Cueva del Agua, but it was first described by F. Bonet, who used the name Cueva de la Laja. We mapped it and made a good collection. We camped along the road.

The next morning we visited a sótano on a narrow ridge to the south above the Xilitilla road. This we named Sótano del Rancho de la Barranca. It was located on a hillside and dropped about 30 m into a single room from which no passages extend. Terry and Jack entered and mapped it. As he exited Jack was attacked by a band of vicious wasps and very badly stung before he could finally pull himself over the lip of the drop. One stung him on the eye and it swelled shut. From here we drove to Cueva de los Potrerillos where a good collection was made and where we camped.

On the 28th we drove back along the old road from Xilitla and stopped off at Cueva de El Jobo to collect and map the cave. Collecting was excellent and it was a good way to end the trip, so we headed home, arriving about 4:00 a.m. the morning of the 29th.

Persons: David McKenzie, Martha Helen McKenzie, Stuart Murphy, and James Reddell

Date: 22 December 1972 - 8 January 1973

Destination: Oaxaca

Reported by: James Reddell

With the exception of very limited areas areound Huautla and north of Sola de Vega the karst of Oaxaca was almost completely unknown in late 1972. Biological collecting in the Huautla region had given promise of really good collections, so the Christmas and New Years holiday of 1972-1973 was spent on a reconnaissance trip to several regions of Oaxaca. The following account is a brief summary of the trip. It points up one thing: the potential of the area is fantastic and deserves a great deal of attention from AMCS members who wish to find extensive systems.

22 December: We left Austin at 12:30 a.m. and drove all night. At Tres Palos we went south on a "short cut" to Soto La Marina. A maze of obscure desert trails finally led us after six hours to the new and still unfinished road from Jiménez to Soto La Marina. We arrived at the ferry to find it broken. After an hour or so delay we were finally able to cross the ferry. We drove south to a place called Santa Juana and slept.

23 December: We drove on to Aldama and located directions to Cueva de los Cuarteles. This cave, located very near the south Texas cavers, is certainly inexcusably neglected. It has not been surveyed nor fully explored. The cave is located on a low hill overlooking a

large, attractive nacimiento. A steel ladder has been placed in the principle entrance, which is a circular sink about 10 m in diameter and 6 m deep with a large tree growing from the entrance. Three main passages lead from this entrance chamber. One straight ahead leads into a complex of small rooms and crawls which, though good for collecting, were only poorly explored. They lead toward a nearby sinkhole with a cave at the bottom so they will probably connect to this entrance. To the left from the entrance chamber a low passage leads into a long (300 m or more) winding series of rooms inhabited by large numbers of bats of several species. Guano covers the floor and parts of the cave in this direction are really miserable. After about 300 m two more entrances are located, through one of which it will be possible to exit. Several promising leads from this area were not explored. From the entrance chamber the third main passage is a low, fairly inconspicuous crawl which leads after about 15 m into a large running tunnel 10 m high and up to 30 m wide. This tunnel, with several short side branches, has a flat dirt floor and intersects a spectacular entrance to the surface every few hundred feet. These entrances usually contain large trees with tremendous vines, used as swings by local children. After about 1000 m the main passage terminates in a huge entrance sink about 100 m long. The cave was not completely explored, will be incredibly easy to map, and is of great geological and biological interest. From here we drove south of Tampico and camped.

24 December: We arrived at Acatlán late at night, walked around for a while and then decided to drive on to Tezonapa to inquire about the rumored Grutas de Tezonapa reported in Pemex' booklet on Mexican caves. We picked up a few leads, but otherwise found nothing concrete on the famed cave. We camped near Tezonapa.

25 December: We decided to check out a lead we had gotten the night before in Tezonapa and try to locate the famed Cueva de Carta Luña. We drove to Rancho Caracol on the Río Tonto and after making inquiries decided it was too far to go to Carta Luña, but we were told of a cave up the Río Tonto a few hours ride by dugout canoe. So we piled into a large dugout and were rowed for two hours up the Río Tonto to Cueva de Ungurria. Collecting was fairly good and the fauna included a 2 m long fer-de-lance (locally called a palanka) which was in a crawlway near the entrance and which barely missed David when it struck at him. The cave is located on a karst hillside only a few feet above the level of the Río Tonto. The river level is much-raised since the construction of the Presa Miguel Aleman, so that there was no vertical potential to the cave. Above us, however, loomed the mass of the mountains of the Zongolica region where the famed Cueva de Carta Luña is rumored to be. Even here, however, the mushroom eaters have caused problems. A cave not far from Rancho Caracol (across the river also) is supposed to be inhabited by hippies. Cueva de Ungurria is entered by an opening about 8 m in diameter. A flat-floored passage extends for about 30 m, then up a flowstone mound and for a short distance further. A passage to the right leads into a complex of slightly lower passages, distinguished by enormous roots and a large population of amblypygids. The total length of the cave is only about 300 m. Collecting, however, was very good and we found several new troglobitic species of great interest. We were then rowed back down the Río Tonto, watching beautiful black and white water birds as they sat on the stumps of submerged trees, and trailed our hands in the warm water. A really fine way to spend Christmas Day, all thoughts of football, cold weather, school, and traffic completely gone. Our can of boned turkey was as good a Christmas dinner as we could imagine. From Rancho de Caracol we drove to another lead south of Acatlán at Rancho Campo Chico. En route we checked a cave (Cueva de La Junta) near the road. It extends for about 100 m before ending. It is dry and dusty, with small breakdown

over much of the floor and of little interest. We arrived at Campo Chico, talked to Luis Calderon, the caretaker, and were given permission to camp on the patio of the house there.

26 December: In the morning we were directed to Cueva del Nacimiento del Río San Antonio. A small stream exits from below a series of travertine dams which rise above the nacimiento to end at a small opening from which water runs during times of flood. A second entrance is located about 20 m away and slightly higher on the hillside. The lower entrance leads into a small room, down a drop, and then into a fairly low area about 70 m long. At this point it opens into the main passage of the cave. A slope up to the right leads to a wide, formation "room" which connects to the right to the upper entrance. The main cave passage extends about 50 m farther before encountering a deep lake in which we found blind catfish and crayfish. The main passage then extends for 350 m as a stream channel 10 to 30 m wide and up to 11 m high. The stream can usually be avoided by walking along wide sand and mud banks, but it is seldom more than 0.5 m deep anyway. The passage ends in a steep breakdown mountain about 25 m high. No opening could be found through the breakdown. About midway along the main passage on the left a climb 3 m high leads up into the main side passage. This passage extends 240 m to a junction. A passage to the left extends 50 m to an intersection of three passages. These remain unexplored. After 120 m a second intersection is reached. An inconspicuous hole between formations leads into a passage 390 m long. It ends in a siphon, although a crevice in the ceiling near the end may go. After 210 m a scramble down over flowstone leads into a complex area of narrow crawls and fissures. Beyond this passage the cave extends for 420 m at which point exploration and mapping ceased. The side passage is very attractive, easy walking, and as far as explored required no special equipment except inner tubes. Many very attractive stalactites, stalagmites, and totem poles are found. The cave is among the more interesting and attractive in México. We left with the resolve to return to map it. To add to its speleological interest it was of incredible biological interest. In addition to blind catfish (only the second troglobitic catfish from México and the only one from a true cave situation known in North America), we collected troglobitic crayfish, shrimp, isopods, millipeds, silverfish, diplurans, collembolans, spiders, and a host of non-troglobites. We spent the night in the patio at the house at Campo Chico.

27 December: On the way from Campo Chico we stopped by Cueva de La Junta for collecting and checked a second small nearby cave, Cueva Chica de La Junta. This is a small opening about 50 m to the left of Cueva de La Junta and consists of a single passage about 20 m long. A small pit in the floor leads nowhere. From here we drove towards Valle Nacional. At km 54.2 on the road from Tuxtepec to Valle Nacional we stopped to inquire about caves. We were directed to a small cave which we called Cueva de Loma del Carmen. This is a small cave with several entrances and a total length of only about 40 m. We spent the night in a hotel in Valle Nacional where we obtained a room for four people for 20 pesos.

28 December: We first drove north of Valle Nacional to a small group of houses where we were guided to Cueva del Guano. The entrance to the cave is near the head of a small arroyo which crosses the highway. A slope down leads into a large bat chamber, perhaps 40 m in diameter and 10 m high. The floor was deep in guano and the air was filled with gnats, bats, and ammonia. After about 50 m a steep slope leads down to a horizontal passage. After a short distance a stream passage is intersected. Upstream we waded for about 100 m before encountering a long pool with low clearance. The stream

contained numerous large blind shrimp and blind crayfish. The latter were eagerly collected by our guides for their supper. Downstream the passage extended for about 100 m. The passage is about 5 m wide and up to 7 m high. The floor contains gradually deepening water, but siphoned just as the water became 3 m deep or more. A stream exiting through breakdown in the arroyo is doubtless the cave stream. The cave was exciting biologically and deserves to be mapped and more carefully explored. From here we went to the famed Grutas de Monteflor in the small village of Monteflor. A small entrance leads into a series of mud-floored rooms, averaging 15 m wide by 20 m long by 5-8 m high. After about 100 m a narrow crevice leads into a final room. A side passage leads through a long series of small rooms and passages, largely filled with formations. The cave contains an abundance of formations, but it is very heavily vandalized. Collecting was good and the cave needs to be mapped. From here we returned to Valle Nacional to eat. At night we drove north to a large spring, used locally as a swimming and bathing place. This is called the Manantiales Monteflor and is a really pleasant place to swim or wade. We collected a few shrimp of a new species.

29 December: We drove a few km north of Valle Nacional and waded across the river running parallel to the highway. We first were directed to Cueva del Brujo. This is a fairly small 150 m long maze cave with at least three entrances. Collecting was poor so we went on to the better-known cave in the area, Cueva del Guayabo. The entrance to this cave is located on the hillside and is a slope-in entrance into a large dry entrance chamber. A slope up over breakdown leads into a single long passage up to 10 m in width and 8 m high. Collecting was excellent throughout the cave. After about 500 m a steep barely climbable mud slope leads down to a lower level. Downstream the passage was unchecked. Upstream the passage continues with small pools of water containing blind crayfish. The passage extends for an additional 500 m, finally breaking up into several crawlways and rooms, not very thoroughly checked. Tiny pools in one contained rare aquatic isopods. The cave is an interesting one, with some potential, and deserves further study. We stayed again in Valle Nacional. In general the immediate area around Valle Nacional has little potential for deep caves, but there is the definite possibility to find extensive cave systems. Rumors abound of large caves and deep pits several hours to a day's walk up into the mountains.

30 December: We continued on the road from Valle Nacional to Oaxaca, hoping to see good karst on the way. In general we were disappointed and in only one place, a large polje at about 3000 m, did we see any karst. Attempts to locate caves finally led us to a single cave, Cueva de las Ladrones. This was a single chamber rumored to be inhabited by robbers. It was about 10 m in diameter and of limited interest. Other caves in the polje are rumored but will require a guide. We drove on to San Sebastian de las Grutas and camped.

31 December: In the morning we were guided to Cueva de Llano Grande (elevation 2010 m). This is a complex of small rooms and breakdown slopes on edges below two main rooms. The cave contains many formations but is not particularly promising. Collecting was excellent. We then went to Grutas de San Sebastian. This cave was earlier visited by Bill and Carol Russell and Ann and Dave Honea (see AMCS Newsletter, III:70-71), but they did not enter the main pit to the stream passage. A treacherous and extremely difficult climb leads down 10 m to a large stream. A rope is definitely needed as a handline. Downstream the passage continues for only about 75 m before siphoning. Upstream it extends as a walking passage with only a meter or less of water on the floor. After about 100 m the passage terminates in a high

breakdown mountain through which the water pours. Attempts to go over and through this mountain were unsuccessful. Collecting was good. We camped near the cave.

1 January: We drove north of Grutas de San Sebastian and checked pits along the way. Only one cave of any note, Sótano de los Arboles, a 30 m unclimbable pit, was explored. No passages lead from this chamber. A large dolina was entered just at dark and a km long dry stream channel winding its way across the floor of the dolina ends abruptly in a 10 m deep unclimbable drop. Local rumors abound of deep pits and larger caves, so the potential of the area is quite good and deserves considerable attention. We drove west of Oaxaca and camped.

2 January: We drove to Nochixtlan and then north to near the small settlement of Santa Catarina where we located Cueva de Santa Catarina. An impressive arroyo enters a sink about 15 m deep and 30 m long. A single low mud-floored passage extends 30 m before becoming too plugged with mud to continue. We then drove down the incredible canyon road into the town of Apoala. Apoala lies in a fairyland setting atop what is apparently a 30 m high travertine dam over which falls a spectacular waterfall. The water from the waterfall is now channeled into irrigation canals on top of the waterfall and used to irrigate a large rice crop. In driving down into the canyon all that can be seen is the incredible green oasis of the rice fields, surrounded by 300 m high limestone cliffs. A leisurely hike up the river leads after a few minutes to a cave entrance along the left side of the canyon. A stream exits through breakdown below the cave entrance and joins the main river. A slope down over breakdown leads to the stream level. One passage to the left leads up into a high sloping room 30 m high, 10 m wide, and 30 m long. The main stream channel extends a reported 500 m or more but lack of flotation gear prevented our exploring it. Collecting was fairly good but will doubtless be better in the back sections of the cave. From here we returned back up onto the top of the canyon and camped. The elevation of Apoala is about 2200 m.

3 January: The terrain here is a very strange barren karst landscape. Large dolinas with sloping walls are cultivated to a large extent. Few lead into caves, however. One which does ends in a sótano called El Comedor del Diablo. A 15 m entrance drop leads to a couple of other small drops and finally a 50 m long crawl to the top of a 50 m drop. Without a tie-off and lacking bolts we were unable to descend this drop, but the cave is reportedly quite deep. A reconnaissance of the area around El Comedor del Diablo led to the discovery of several small blind pits and a couple of unchecked sótanos. With more time doubtless some very interesting finds will be made here. The elevation of Comedor del Diablo is about 2500 m, so you have a potential of at least 300 m and possibly much more. From here we drove to north of Huajuapán and camped.

4-6 January: We drove to Campo Chico and camped. We then spent the next three days surveying and collecting the cave. All was surveyed which was explored (see above for description) but we were forced by lack of time and a steady deterioration of equipment and energy to leave with many leads unchecked.

7 January: We completed the long drive back to Austin, arriving early in the morning of January 8th.

Persons: Mary Butterwick, David McKenzie, Martha Helen McKenzie, Stuart Murphy,
and James Reddell

Date: 16 February - 14 May 1973

Destination: Southeastern México and Yucatán

Reported by: James Reddell

This trip was conceived to be an initial survey of the caves of the Yucatán Peninsula in preparation for a book on the caves of Yucatán. Since my PhD Dissertation is on the cave fauna of the Yucatán Peninsula it was planned to combine mapping and exploration of caves with extensive collections. No real plans were included to do work in other parts of México, with the exception of completing the map of Cueva del Nacimiento del Río San Antonio, Oaxaca. The accident mentioned below modified our plans somewhat and we explored a few caves en route to Yucatán. This trip report includes only the non-Yucatán part of this trip. A preliminary report on the caves of Yucatán will be included in the next issue of the AMCS Newsletter.

16-23 February: We left Austin at 7:00 a.m., drove to Reynosa where we were refused admission into México because we lacked \$100.00 per person per month. We drove on to Brownsville and crossed. Near Nautla, Veracruz, David fell asleep at the wheel and the car ended up in the bottom of the ditch with the left front wheel gone, the underside generally wiped out, and a few minor cuts and bruises. A wrecker finally arrived and we were taken to Poza Rica. It being David's birthday we sang Happy Birthday to him as we sat in the Blazer being towed into Poza Rica. We got a room and spent the night there. After two days we were finally told the Blazer must go to Mexico City for repairs. So we took the bus to Mexico City, expecting to be there a couple of days. After continual hassles with insurance men, mechanics, etc., it was the weekend and we were assured the truck would be ready on Monday.

24 February: David and I took the bus to Villa Juárez, Puebla, where we had a good cave lead. A long walk down a canyon to the west of town led for 3 km to a cave referred to as "Cueva de la Mona." This is actually three small caves, each distinct from the rest. Cueva Tunnel de la Mona is a tunnel about 13 m long and good only as a pleasant place for a picnic. Cueva Grillo de la Mona is a small crawlway about 10 m long. The third cave, Cueva Vampiros de la Mona is a pit located immediately inside a small crawlway entrance. A 3 m drop leads into a small room 3 m in diameter and 7 m high containing a large vampire bat colony. A pit on the left side drops unclimbably for about 7 m. The cave is hot and oppressive and so not promising. The walk out of the 200 m deep canyon was not bad and we admired the many waterfalls which could be seen along the walk. Three other caves were reported locally: Cueva de la Xochipila is a sacred cave near town, but is probably a rock shelter. Cueva del Tigre (Rincón del Tigre) is also near town and also apparently a rock shelter. The third cave is (naturally) "una legua" away since it is supposedly very large. From here we caught the bus back to Mexico City.

25-27 February: Monday came with the car still unrepaired. We were given constant assurances it will be ready "mañana." Finally on the 27th we get our visas extended and exhaust ourselves seeing Mexico City.

28 February: We took the Metro and then a streetcar to the outlying city of Ixtapalapa, still in the Distrito Federal. We were directed to a lava cave on the side of Cerro de la Estrella. This cave has no known local name although it is frequented by all of the local people. A sloping entrance leads down into a small room. A crawl from this room leads into a complex of small breakdown-floored rooms and crawlways. The total explored

length was about 150 m, but many leads were left unchecked. The cave was very dusty and the ceiling was matted with fine roots and longer roots hung from the ceiling in many places. The cave is formed in a very irregular lava, refilled by rubble and silt and is now being re-excavated. In few places can solid rock be seen. The walls of the cave show the evidence of very heavy traffic through it by the presence of much graffiti. We had been warned away from this area because of many hoodlums. We laughed about this until we were standing at the streetcar stop and a large rock thrown with great force sailed between our heads, barely missing one of us. Fortunately the streetcar arrived, we climbed on, and returned to our hotel.

1-2 March: We spent two more days hassling with the mechanics, visiting bookstores to buy Mexican state maps, and visiting the Universidad Autónoma de México. Lack of parts prevented the car from being ready.

3 March: It being the weekend and nothing being done on the car we took the bus to Orizaba and in the afternoon went out to Tlilapan inquiring about caves. We spent the night in Orizaba.

4 March: We mapped Cueva del Ojo de Agua de Tlilapan (see map) and made extensive collections of its very rich fauna. The cave is entered above a nacimiento called Ojo de Agua or Agua Negra. The cave consists essentially of a large entrance room floored with breakdown, an inner Lake Room to the right, a large Bat Room and smaller Inner Bat Room, and finally a small Formation Room. After completing the map we returned to Orizaba. David returned to Mexico City to finish hassling with the car.

5 March: The rest of us returned to Tlilapan and began a map of Cueva Macinga. This stream cave is also known to us by the name "Cueva del Agua de Tlilapan" and to the Italian biospeleologists (Valerio Sbordonì and Roberto Argano) as Cueva del Ojo de Agua de Tlilapan n. 2. Cueva Macinga, however, is the universally used local name. The main entrance to the cave is about 3 m high and 2.5 m wide. A large stream pours from the entrance, runs through a culvert under the road, and over a 5 m drop to the river below. The main passage is extremely irregular in cross section and ranges from 1.5 to 5 m wide and from 2 to 7 m high. The water depth is usually about 1 m. The air temperature was 65°F and the water temperature 64°F. One principal side passage, a crawlway to the right, ends after about 50 m. A major breakdown has occurred about 100 m from the entrance. Beyond this point the water depth is 3 m or more. The passage continues at least 50 m beyond this point but lack of flotation gear prevented further exploration or mapping. We returned to Orizaba for the night.

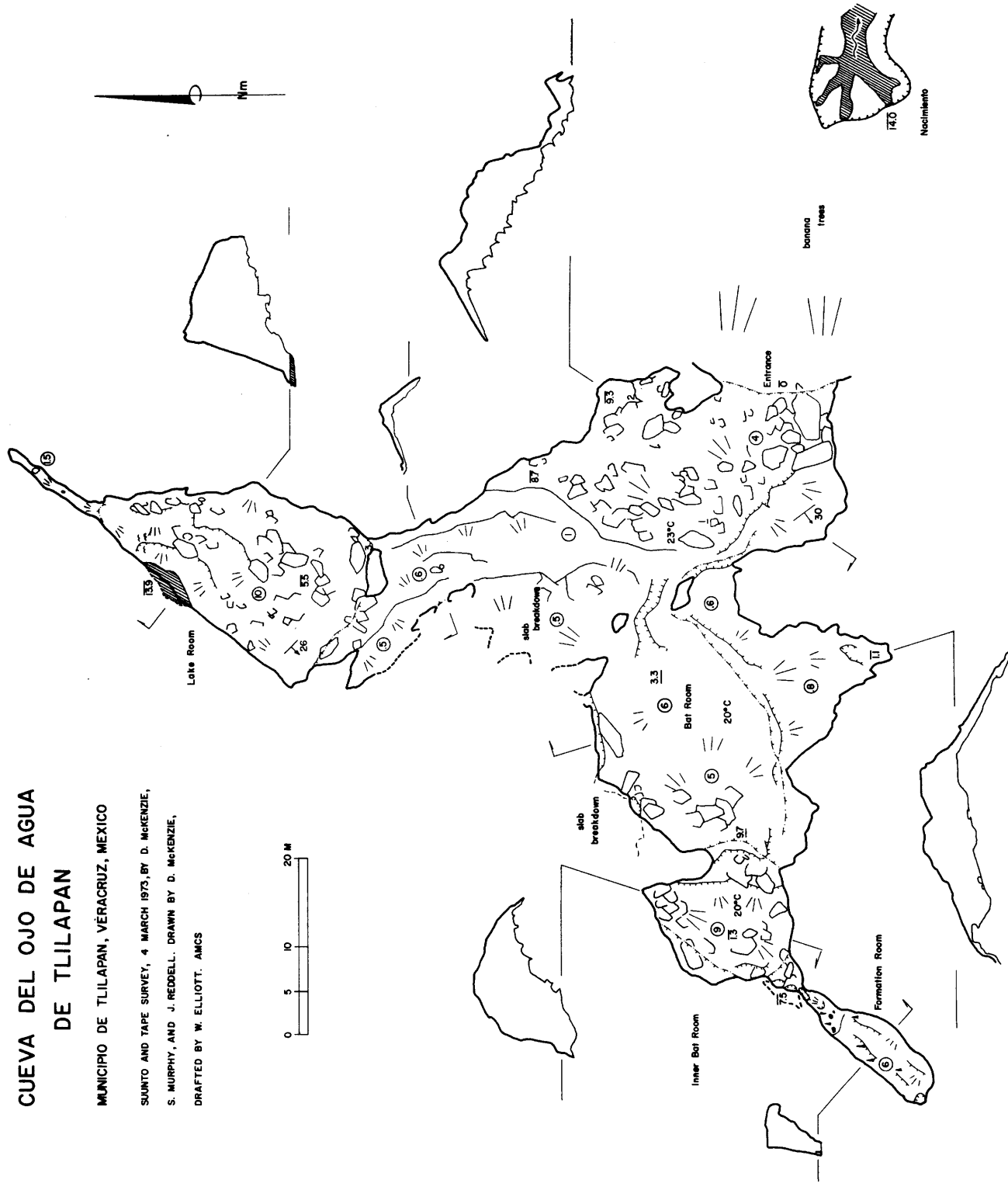
6 March: Stuart and I climbed about 30 m up on the side of Cerro Borrego, a hill overlooking Orizaba. Here is the vertical entrance of Cueva del Soldado. A 3 m drop leads to a ledge across which a large formation has fallen. A second drop of 3 m leads to a ledge and then a slope to the actual bottom of the entrance sink. A crevice 1 m wide and 3 m long drops 5 m to a sloping passage 5 m long where a 7 m drop leads to a slope to another 7 m drop which is barely climbable. At the bottom of this drop two additional drops on the same crevice lead down to a mud-floored end. The walls of the entire crevice are lined with calcite crystals. The total depth of the cave is about 40 m. The cave was reportedly used to cache weapons and ammunition during the Revolution.

7 March: We took the bus to Ojo Zarco near Orizaba. We first visited Cueva de los Vampiros, a small cave about 300 m from a spring near Ojo Zarco. The area en route to the cave is park-like and frequented by people from the nearby towns. Cueva de los Vampiros is made up of two small rooms and many vampire bats. Total length is only about 10 m. A steep climb up the hillside leads to a prominent shelter cave, called by

CUEVA DEL OJO DE AGUA DE TLILAPAN

MUNICIPIO DE TLILAPAN, VERACRUZ, MEXICO

SONTO AND TAPE SURVEY, 4 MARCH 1973, BY D. MCKENZIE,
S. MURPHY, AND J. REDDELL. DRAWN BY D. MCKENZIE,
DRAFTED BY W. ELLIOTT. AMCS



us the Lower Cave. This small cave is about 10 m long, 7 m wide, and 5 m high. From this shelter a steep cliff rises 50-75 m. A precipitous climb of 15 m leads to the Balcón del Diablo. A spectacular view of Citlatapetl may be had from this point. The back of the balcony contains the entrance to Cueva del Diablo. The entrance passage is rock-floored and leads after about 30 m into one end of a large passage up to 15 m high. From this point a steep muddy passage leads up to the right for 15 m, turns to the left and slopes steeply down, making a circle to appear at the bottom of a 3 m deep pit at the base of the slope up to the right. The main cave passage extends from the pit for 200 m as a mud and rock-floored passage 7 to 15 m high and 7 to 10 m wide. It slopes up for its entire length and finally ends abruptly. The cave contains much trash and has been frequently visited by local people. It is badly in need of mapping.

8 March: David finally arrived and we left for Acatlán and Campo Chico. We began mapping Cueva del Nacimiento del Río San Antonio. We went back to the point in the main side passage where we had stopped surveying on our previous trip. The passage continued for 90 m to a major intersection. We mapped to the right for 120 m to another junction. A narrow high joint-controlled passage to the right extends 90 m and ends. The main passage continues 360 m before ending in a large siphoned lake. The bypassed side passage was then returned to and surveyed. This passage is in many ways the most attractive in the cave. The floor is of bottomless green water with barren walls and bizarre solutional features, including pinnacles and pendants hanging down into the water. After 300 m the passage forks and both passages end fairly quickly. On the way out we surveyed a passage we had earlier left unexplored. This was a complex of fissures and crawls ending after about 180 m. Exploration ended at the bottom of a breakdown-filled room. This passage probably eventually connects to the first side passage off of the main side passage.

9 March: We completed the map of the cave as described above.

10 March: We were guided to Cueva de las Maravillas by the owner of Rancho Campo Chico. This cave is located on the road back to Acatlán. The cave is a small opening on a thickly-jungled hillside. A drop leads down into a complex of walking and crawling passages from which one main passage was followed. This passage was flat-floored, 5 to 10 m wide, and 3 to 10 m high. It was paced for 1000 m and steadily became larger. Lack of time and a determination to map it later led us to exit at this point. We returned to Campo Chico and finished work in San Antonio. We left the cave thinking we had completed it. Later Peter Strickland and others found a way through the breakdown at the end of the main cave passage and reported that it continued the same size as before the breakdown. They explored to a large lake requiring flotation equipment.

11 March - 14 May: We drove to Mérida, via the ruins of Palenque, Chiapas. While in Yucatán we explored about 60 caves, mapped all or part of 22 caves, including Actun Xpukil, Actun Kaua, Grutas de Xtacumbilxunam, and Cenote Aká Chen. Reconnaissance of many areas has given us many leads. The last part of the trip to Yucatán, however, was marred by much illness including severe cases of amoebic dysentery.

Persons: James Reddell and J. Mark Rowland

Date: 19-27 July 1973

Destination: Eastern México

Reported by: James Reddell

While en route to Yucatán James Reddell and J. Mark Rowland, both graduate students in biology at Texas Tech University, stopped at a few caves and made collections in these as well as at several surface localities. We left Austin on July 19, drove to near Monterrey and slept. From here we drove to Chorros del Agua and collected ricinuleids on the surface below Cueva de Chorros del Agua. We then drove to the Nacimiento del Río Frío and slept. In the morning we collected ricinuleids and other arachnids on the surface above Cueva de la Florida. We then drove on to El Salto, west of Antiguo Morelos. We made surface collections below the falls and then drove on to Cueva de La Lagunita. This cave is located about 25 km NE of Cd. Mafz and consists of two rooms. A sloping entrance which receives much flood water leads over breakdown into the main room. This room is about 40 m long, 10 m wide, and 5 m high. Along the left side a crevice leads down into a second room about 15 m long, 5 m wide, and 8 m high and containing a stream. The stream emerges from breakdown and quickly ends in a siphon. From here we drove to Valles and then up into the mountains above Xilitla to Laguna Colorado, Querétaro. We made extensive surface collections and examined many small sinks but found nothing of value. We camped here and then in the morning of July 22nd drove south. We first collected in Cueva de El Ocote, Hidalgo, a small road-side cave and then in a small cave by the side of the highway at Puerto Zorro. From here we drove through Mexico City to Puebla and then on into Tabasco to Grutas del Coconá. This impressive commercial cave is about 1000 m long, contains several unchecked leads, a large lake, and is in serious need of mapping. We made an excellent collection here and then drove on to the ruins of Palenque where we met Dr. Robert Mitchell, his wife Rexell, their three children (Robert, Sharon, and Scott), a Tech student, Deborah Denson, and a Japanese flatworm specialist, Dr. Masaharu Kawakatsu. Since they were all staying in a small Airstream house trailer Mark and I retired to Palenque where we got a cheap hotel room. The next day we made local collections and visited the ruins. On July 26th we drove 15 km SE of Palenque to the Cataracta Monteapa. This is a spectacular waterfall below which are great boiling rapids. A large cave entrance from which a stream emerges could be seen across the river, but the flood-stage river made it impossible to reach the cave. It is reported to extend back to a large lake. On the 27th we left Palenque and drove through Campeche to Mérida, Yucatán. Mark picked up his wife at the airport and made a leisurely return trip to the United States. I remained in Yucatán and collected in surface and cave localities until the 15th of August when I returned to Austin. The Yucatán part of this trip will be included in my summary of the caves visited in Yucatán to be published in the next issue of the AMCS Newsletter.

Persons: John Donavan, Peter Lord, Mike Boon, Joan Becket, Peter Strickland, and
Blake Harrison

Date: 9-20 September 1973

Destination: Sótano de la Joya de Salas, Tamaulipas

Reported by: Blake Harrison

This trip was pretty much an international affair. Peter and John were from England, Michel Boon and Joan Becket were from Canada, and their lost guides, Peter Strickland and I, from Austin. Within a day and a half, the six of us were on our way for about two weeks of Mexican caving. Peter offered to take his Speleo Power Wagon. We knew we would be doing quite a lot of four-wheel driving due to the road conditions and time of year. It was close to the end of the rainy season there. Well, the road WAS rough.

We had no difficulty crossing the border and drove on into the night towards Encino, our first destination. After a wrong turn at Victoria or somewhere and a flat tire that lasted approximately 200 yards after being fixed by a “friendly” local, we were ready to see Encino.

We arrived at Encino ready to go, with a full tank of gas and prepared for the four-to six-hour ride to Joya de Salas. Part way up the road we met a road crew, which meant that from there on we were the first vehicle up the road since the rainy season had started. The road was untraveled but not impassable. Near the middle of the afternoon, we were at a place that a couple of us recognized, but we weren’t sure whether or not it was the right road. There were logging roads everywhere. The next morning, John and I left camp on foot (due to the fuel supply) hoping to find Joya de Salas and the right road from where we were. Three hours later, he and I were at the pit. It was taking quite a bit of water. This lowered our hopes of a successful caving trip. We started back to the truck and arrived five hours later, extremely tired.

The next morning we drove on into the town of Joya. We were greeted by many of the locals and a note at the entrance saying that we needed permission from Sr. Carlos Hernandez who lived in Cd. Mante. Well, we weren’t about to drive back to Mante to ask, so we checked with several of the locals and acquired suitable permission.

Arriving finally at the pit, we were greeted with the pleasure of seeing no water entering the pit’s recesses. It took us several hours to prepare ourselves for the drop and get it properly rigged and padded. We had nine bags that had to be lowered into the pit. Our plan was to spend around five days in the cave or until it was pushed to the end. Quite a task, or so we thought, since the area around Joya has close to 3000 ft of limestone for the water to drain. The job of getting all the bags into the cave and down to base camp took nearly 12 hours. We camped about 850 feet underground, at the bottom of the last major pitch in the cave, a 230-foot drop. We were surprised to find water at the entrance to the passage we were to be using for the next several days; there was air space (not much) but passable. Luckily for us, the water had receded by the next morning. But we were still prepared for some swimming. All had wet suits to keep warm in, due to the amount of water passage involved.

Our first day of caving was filled with mapping about 700 m of walking passage and exploring several other side passages. Our tired crew returned and slept for ten hours. It’s nice to wake up in totally pitch-darkness; if you want, you can just go back to bed.

Our second day in the cave was filled checking out some more leads, none of which went. One crew had planned to blast out a small rimstone dam that was block-

ing passage beyond, but the water was just too high to blast safely, so that attempt failed. The lead that Pete Lord and I checked didn't go. Again tired, we returned to camp to get some rest and leave the cave the next day.

Our third day from noon until midnight was spent with the grueling task of hauling up all the gear we had brought with us. We were really tired that night. We didn't even get all of the bags up, so we finished the next morning. By noon we were ready to leave Joya. The locals, as always, were there giving us farewells and asking us for our spare water jugs. We gave them some and left the town by noon. Many hours later, after getting stuck once, we were in Encino. It sure was good to see the pavement again, especially since we were about to have another flat.

The next day I took the bus from Monterrey back to Austin since I was supposed to have been at work two days earlier. The rest of the crew spent the remaining few days touring and visiting Gruta del Palmito.

—Reprinted from UTG News, 6(3):4-5.

Persons: Blake Harrison, Peter Sprouse

Date: 20-21 October 1973

Destination: La Gruta del Precipicio

Reported by: Peter Sprouse

After being unable to find a third caving partner in Austin Friday night, we decided nevertheless to leave for Bustamante Canyon about 9 p.m. Arriving in the early hours, we slept at Ojo de Agua. Arising late, we didn't start the long hike until 1 p.m. Saturday. There was another truck from Texas in the parking area so we expected company in the cave.

Our objective was to gather additional data for the big room sketch at the rear of the cave in order to complete the map. Gruta del Precipicio is high up on the side of Bustamante Canyon and requires a steep rocky hike of over two thousand feet in elevation change.

After two hours and 45 minutes of hiking and scrambling, we arrived at the cave entrance. We left our backpack just inside the mouth, removed our ropes from it and started into the cave. We had only gone about 100 feet into the cave when Blake, who was leading, slipped while negotiating a five-foot high sloping climb down. He had his arm behind him on a handhold and when he slipped, his arm twisted behind him and apparently pulled his upper arm bone out of its socket at the shoulder. While we were analyzing his injury, the other group returned from the back of the cave. It consisted of two cavers from Laredo, Tom Addison and David. Together we returned to the entrance, where we attempted to massage the bone back into place, with no success. Not knowing whether the bone might be broken or if any internal bleeding was occurring, we decided to start down the mountain immediately.

Blake was in considerable pain and was forced to keep his arm in one certain position for the pain to be bearable. This made the steep descent a difficult task, which even under normal conditions is rather tricky. The Laredo cavers helped by carrying down Blake's vertical gear and machete. Leaving the entrance at 4:30 p.m., we were slowed by several climbs down which normally are no problem. On one I had to give Blake a top tension belay and lower down my pack containing rope, water and caving gear.

The sun set about three quarters of the way down the mountain, and we reached our vehicle after three hours of hiking. The Laredo cavers, who had gotten down fifteen

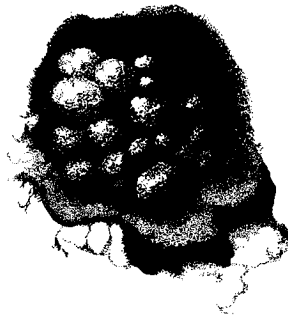
minutes ahead of us, left for home. After a short rest, we prepared to head for the border also. I gave Blake two Darvon (pain killers) to ease his pain.

We stopped at a restaurant in the town of Bustamante for a refresco and talked with some Mexicans who had a map of La Gruta del Palmito. We then hauled ass for Laredo and the hospital there. Speeding through Customs, we got to the hospital at 1 a.m. Sunday. After an hour and 15 minutes of waiting and red tape examinations, we found out they couldn't do anything until morning because the X-ray room was closed and the right doctor wasn't there. So we decided to drive on to Austin and a decent hospital, despite the difficulty in staying awake to drive. We got to Austin just as dawn was breaking. After 15 hours, Blake's arm finally got proper medical attention. They administered muscle-relaxing drugs and pulled the bone back into the socket. We left the hospital shortly after 9 a.m.

Most accident reports need a moral. We broke one of the primary rules of caving by going with only two people. Fortunately, there were other cavers on the spot, but things could have easily been different. The fall could have been in the rear of the cave instead of the front, and the injury could have as easily been an incapacitating spinal break. In such a circumstance, I would have had to leave him alone, ascend the two drops, climb down the mountain and find the nearest long-distance phone to call the Waco cave rescue number. What had been 15 hours until treatment could have been 48.

Also evident to us was our obvious lack of first air knowledge. We didn't know which direction we should pull the arm to get it back into the right place. The whole ordeal pointed to the usefulness of the Texas Speleological Association first aid and rescue practice sessions.

—Reprinted from UTG News, 6(3):5-6



ARTICLES

LA GRUTA DEL PRECIPICIO

by Mike Walsh

High up on a cliff near the southern end of El Cañon de Bustamante, Nuevo León, México, several large holes look down on cavers and locals alike. For many years cavers have questioned the locals only to find out how little they knew. Jim McLane and Charles Fromén of the Rice Grotto made an attempt in 1968 to reach what the locals called El Volcán. Unfortunately they were unable to reach the vertical series of caves on the cliff.

Many cavers saw the holes but none were able to reach them until December 30, 1972, when Wayne Russell (Alamo Area Chapter), John Graves (A.A.C.), and John Parker (Wales, Great Britain) finally reached the mouth of the cave. Wayne and crew had first tried a frontal attack. Upon reaching sheer vertical cliffs, they found that the entrance was still 120 m above them. They had tried following the ridge to the right of the entrance but were stopped 60 m from the entrance by a 150 m drop. It was on the third trip that the trio finally reached the entrance by going up the hill south of the cave and coming down a steep talus slope which ended at the cave.

Six hundred and ten meters above the road the entrance stood waiting. A thick layer of powdery dust on the floor gave proof to the hope that they were the first to enter the cave. The dust, in some places reaching one-half meter in depth, collapsed everywhere the cavers set foot.

The entire upper level was covered with this dust. From the large entrance the passage remains about 6 m in diameter for most of the 450 m to the big drop. The walls are smooth and mostly devoid of formations in the upper level. After going down a 45 m drop, they were in a large canyon passage 15 to 20 m wide and up to 30 m high. The canyon passage is well decorated with large white popcorn formations. In the direction of the cliff the passage becomes impossible to follow after a couple of hundred meters. The passage running deeper into the mountain has a 12 m drop after 300 m of walking passage.

This extremely dangerous drop overlooks a large room 60 m long, 40 m wide, and up to 70 m high. At the far side of the room it is necessary to climb a steep breakdown mountain to reach the Big Room.

The first mapping trip was led by Wayne Russell (Alamo Area Chapter) in late January 1973. Included in the group were John Graves (A.A.C.), Mike Walsh (Southwest

Texas Grotto, A.A.C.), Steve Fleming (A.A.C., S.W.T.G.), Keith Heuss (S.W.T.G.), and Stan Moerbe (S.W.T.G.). Only the first mapping trip will be recounted here since complete dates and personnel will be listed on the map when it is completed.

On this and other trips we arrived Friday from the States and started up Saturday morning. After a three hour climb to the cave we mapped the cave to the large drop. Following a few hours sleep we rigged the drop. We had checked and mapped every lead in the upper passage, but none of the side passages had been extensive. After doing the 45 m drop we continued mapping the main passage. Around 3 o'clock Sunday morning we stopped mapping and went to explore the Big Room. After exploring for 2 hours and mapping for 13 hours we then returned to the entrance to sleep. Three hours later we came off the mountain and drove back to the States. This was to prove to be a typical trip. On later trips we mapped and checked every lead but one. This was an 8 m vertical shaft just off the main passage. Frankly, we were afraid of what we might find. The mapping of the Big Room was such a large task that we felt we should finish it first. The large room is 170 m long, 45 m wide, and up to 30 m high. It is filled with large Carlsbad type formations up to 30 m high and 10 m in diameter. At the far end of the large room the ceiling drops and the large breakdown mountain goes downward. In this 60 by 30 m section of the cave thousands of small delicate formations can be found. Large white flowstones, curtains and columns decorate this area. What about the lead we bypassed? Shortly after we finished mapping the Big Room, 14 members of the AMCS pushed the passage. It proved to go downward for about 75 m of vertical distance until two holes too small to enter were reached. The holes were blowing large amounts of air.

What is the significance of this cave? First it is a major cave. It is over 700 m long and over 150 m deep. It has large rooms and is well-decorated. Most important is that it proves that northern México still has fantastic caves left to be discovered. The cave is easy weekend material, and due to the location and the drops, it will be protected from vandalism by the locals. Spurred on by this new success, AMCS cavers have recently located another cave near Monterrey. The caves are out there. All we have to do is find them.

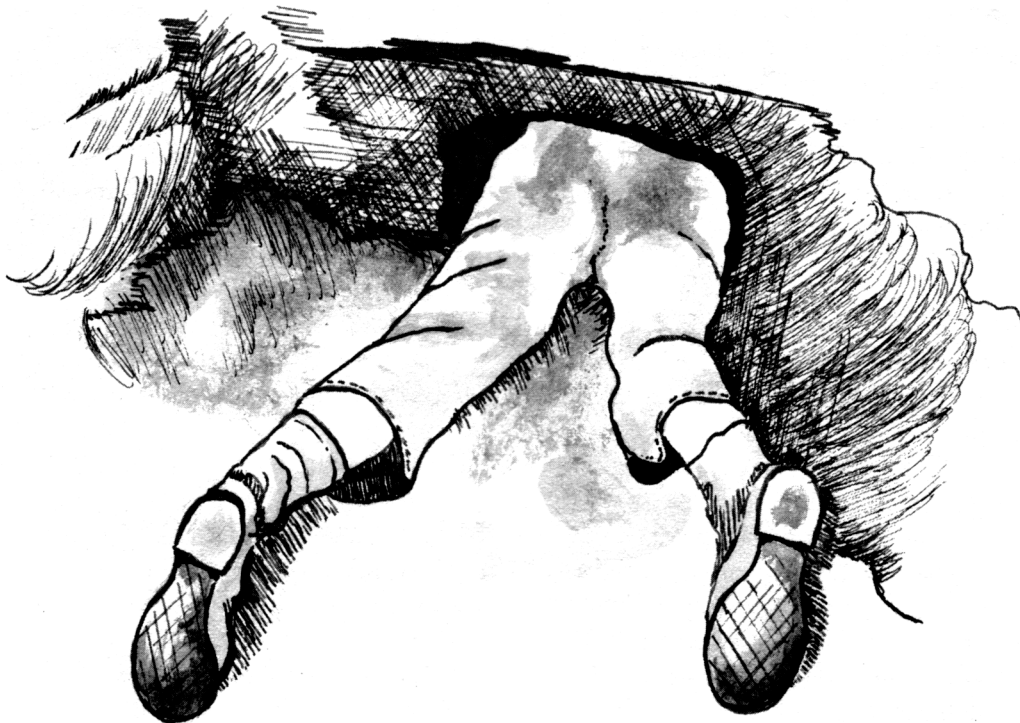
CUEVA DE LA SIERRA PARTIDA

by Amador Cantú, Jr.

Cueva de la Sierra Partida is located on the north slope of the old volcano, La Sierra Partida, which is about 13 km west of Ocampo, Tamaulipas. The cave was formed when the lava flow solidified and the inside remained viscous and flowed out, leaving a void. The three entrances were formed when the ceiling of a large room collapsed. There is much red lava, indicating a high iron content in the lava. This cave is located in the same lava bed as "Cueva de los Secundarios," but is almost directly in the main remnants of the cone.

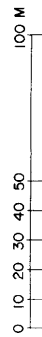
The cave was first entered by Jim Clements and me with one butane lighter. We followed the cave until we decided to get back in case the others became worried. The cave was revisited in June 1973 and mapped by Peter Strickland, Paul Duncan, Edna Garcia, Glenda Dawson, Jim Clements, and me (see map). There are a few bats in the cave as well as a sort of fly larva that lives on some sort of web. There are also some white moths in the same section of the cave as the larvae. The cave continues past station 50, but due to the sharp lava and low ceiling it was impossible to continue. There was, however, an air flow at that point.

To my knowledge this is the longest lava tube mapped in México (about 850 m or 2788 ft), but the length should be exceeded by one of several other lava tubes nearby, which have only been partially explored.



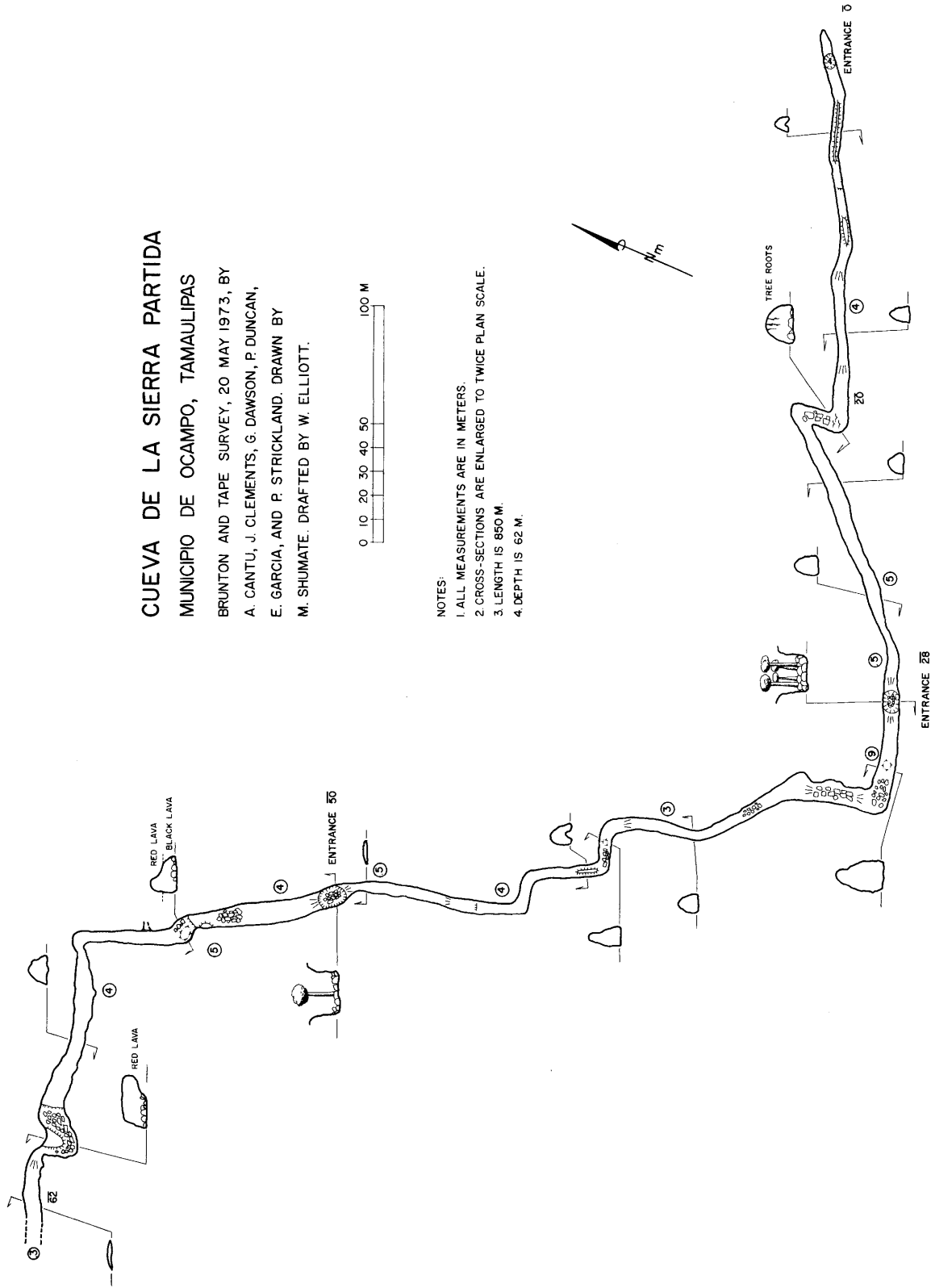
CUEVA DE LA SIERRA PARTIDA MUNICIPIO DE OCAMPO, TAMAULIPAS

BRUNTON AND TAPE SURVEY, 20 MAY 1973, BY
A. CANTU, J. CLEMENTS, G. DAWSON, P. DUNCAN,
E. GARCIA, AND P. STRICKLAND. DRAWN BY
M. SHUMATE. DRAFTED BY W. ELLIOTT.



NOTES:

1. ALL MEASUREMENTS ARE IN METERS.
2. CROSS-SECTIONS ARE ENLARGED TO TWICE PLAN SCALE.
3. LENGTH IS 850 M.
4. DEPTH IS 62 M.



RECENT PUBLICATIONS ON MEXICAN SPELEOLOGY

This is to be a regular feature of the AMCS Newsletter. For each newsletter we will include as many abstracts of current publications on Mexican speleology as is possible. These will include articles in both the scientific literature and in popular caving and non-caving publications. Although biology will predominate because of our greater knowledge of the literature we will include as many abstracts of articles in other disciplines as we are able to locate or which are pointed out to us. The current listing includes only articles published during 1973. A second installment of 1973 listings will be included in the next newsletter. Eventually we hope to include abstracts of all articles on Mexican speleology published during 1973 and to maintain a current listing from the beginning of 1974 on. We eagerly solicit people to send us copies or references to articles which may appear in local grotto publications or in magazines or newspapers.

Abstracts

Ashworth, A.C. 1973. Fossil beetles from a fossil wood rat midden in western Texas. *Coleopterists' Bull.*, 27(3):139-140.

The ptnid beetle, *Niptus abstrusus* Spilman, is reported from a fossil wood rat midden in a cave in Texas. The species is also known from three caves in northern Coahuila, México.

Boon, Mike. 1973. A note on "Finn's Magic Sinks," Cenalho. *Canadian Caver*, 5(1):48-50.

This brief article includes the description of a very large, unnamed, river cave in the vicinity of Cenalho, Chiapas. The cave is reported to be very large and to contain a deep river. It was explored for about 1000 ft before exploration stopped. A location map of caves in the Cenalho area is included.

Brignoli, Marcello. 1973. Note sulla morfologia dei genitali degli Schizomidi e diagnosi preliminari di due nuove specie del Messico (Arachnida, Schizomida). *Fragmenta Entomologica*, 9(1):1-9.

This paper discusses the use of the female genitalia as a diagnostic character in the identification and description of schizomids. Appended to it are brief descriptions (based only on females) of *Schizomus arganoi* n.sp. from Cueva de la Golondrina, Bochil, Chiapas; and *Schizomus sbordonii* n.sp. from Cueva de Ojo de Agua Grande, Paraje Nuevo, Veracruz.

Darilek, Glenn. 1973. San Pedro de Iturbide. *Texas Caver*, 18(2):36, map.

This brief article includes a report of two trips to Las Grutas de San Pedro de Iturbide, Nuevo León, for the purpose of mapping the cave. A map is included of this 175 m long cave.

Elliott, W.R., and R.W.Mitchell. 1973. Temperature preference responses of some aquatic, cave-adapted crustaceans from Central Texas and northeastern México. *Internatl. J. Speleol.*, 5(2):171-189.

In addition to four species of crustaceans (amphipods and isopods) from caves in Central Texas specimens of *Speocirolana bolivari* (Rioja) from Grutas de Quintero,

Tamaulipas, were studied to determine their temperature preference responses. It was found that *S. bolivari* had a weak preference for 20°-30°C. It is speculated that this species may retain its temperature selectivity because of a slow rate of cave-adaptation.

Gates, G.E. 1973. Contributions to North American earthworms (Annelida). No. 8—The earthworm genus *Octolasion* in America. Bull. Tall Timbers Res. Sta., 14:29-50.

This revisionary study of the genus *Octolasion* in North America includes records of *O. tyrtaeum* (Savigny) from four caves near Valle de los Fantasma, San Luis Potosí.

Gay, C.T.E. 1973. Olmec hieroglyphic writing. Archaeology, 26(4):278-288.

The use of the Olmec cave sign is discussed, along with other aspects of Olmec hieroglyphic writing. Photographs of petroglyphs from Grutas de Juxtlahuaca, Guerrero, and from the cave Sanctuary of the Pictographs, at Chalcachinga, Morelos, are included.

Grove, D.C. 1973. Olmec altars and myths. Archaeology, 26(2):128-135.

This article includes a discussion of the Olmec paintings in the Oxtotitlan Cave, Guerrero. Two of the more interesting paintings, including the unique man-jaguar union, are reproduced. The significance of the Olmec use of caves as ceremonial centers is discussed.

Holt, P.C. 1973. A summary of the branchiobdellid (Annelida: Clitellata) fauna of Mesoamerica. Smithsonian Contr. to Zool., 142. 40 pp.

Included in this comprehensive review of the branchiobdellids of Mesoamerica are two species from caves in México. *Cambarincola acudentatus* n.sp. is described from off of *Speocirolana bolivari* and *S. pelaezi* in Grutas de Quintero, Tamaulipas. *Cambarincola susanae* n.sp. is described from off of *Procambarus acutus cuevachicae* at Cueva Chica, San Luis Potosí.

Howden, H.F. 1973. Four new species of *Onthophagus* from Mexico and the United States (Coleoptera; Scarabaeidae). Proc. Entomol. Soc. Washington, 75:329-337.

Included is the description of *Onthophagus cuevensis*, n.sp., from Cueva de las Avas, San Luis Potosí, and Cueva de Rancho del Cielo n. 7, Tamaulipas. This species was also taken from an epigeal locality, but it is most frequently found associated with bat guano.

Jones, J.K., Jr., J.D. Smith, and H.H. Genoways. 1973. Annotated checklist of mammals of the Yucatán Peninsula, México. I. Chiroptera. Occ. Pap. Mus. Texas Tech Univ., 13. 31 pp.

Cave records for eighteen species of bats in the state of Yucatán are included in this useful summary. In addition to new records all older cave records of live and fossil bat occurrences are included.

McLain, Jim. 1973. Depressing discoveries or The more agonizing aspects of cave exploring. Texas Caver, 18(4):104-105.

This article recounts the frustrations of trying to locate and explore the fabled

cave, El Volcán, in Bustamante Canyon, Nuevo León. This cave later was discovered and is now known by the name, Las Grutas del Precipicio.

- Madill, Joe. 1973. A brief visit to the Sumidero Chicja and the Cueva de Agua Caliente. *Canadian Caver*, 5(1):50-51.

A reconnaissance trip to two highly promising caves in Chiapas is briefly recounted. Sumidero Chicja receives the waters of the Río Chicja and was explored for only a short distance. Exploration will require boats and wet suits. Cueva de Agua Caliente contains a stream flowing out of a 40 ft high opening. A waterfall 800 ft from the entrance stopped exploration, but other leads exist.

- Magniez, Guy. 1973. Description du mâle de *Mexistenasellus parzefalli* (Crustacea Isopoda Asellota cavernicole du Mexique) et observations sur cette espèce. *Internatl. J. Speleol.*, 5(2):163-170.

The male of the troglobitic stenaseiid isopod, *Mexistenasellus parzefalli* Magniez, from Cueva del Huizache, San Luis Potosí, is described.

- Peck, S.B. 1973. A systematic revision and the evolutionary biology of the *Ptomaphagus* (*Adelops*) beetles of North America (Coleoptera; Leiodidae; Catopinae), with emphasis on cave-inhabiting species. *Bull. Mus. Comp. Zool.*, 145(2):29-162.

This monographic treatment of the North American *Ptomaphagus* (*Adelops*) beetles includes the description or redescription of all known Mexican cavernicolous forms. *Ptomaphagus cavernicola cavernicola* Schwarz, a troglophile, is reported from Grutas del Palmito, Nuevo León. *P. cavernicola aditus*, n.subsp., is described from Cueva de la Boca, N.L. This subspecies is a troglophile with reduced eyes. *P. gypsum*, n.sp., a troglobite, is described from Resumidero de Pablillo, N.L. *P. troglomexicanus* Peck, a troglobite described from Cueva de la Perra, Tamaulipas, is also reported from Cueva Chica de la Perra and Cueva de la Mina, Tamps. *P. elabra* Peck, a troglophile described from Cueva de El Pachón, Tamps., is now known from 19 caves in and near the Sierra de El Abra, San Luis Potosí and Tamaulipas. *P. leo*, n.sp., a troglone or troglophile known from forest litter at Chipinque Mesa, Monterrey, N.L., is reported from a small cave on Chipinque Mesa and from Cueva de Chorros de Agua, N.L. *P. spelaeus* (Bilimek), a troglophile, is redescribed. It is known from Grutas de Cacahuamilpa, Gruta de Acuitlapán, and Resumidero de Río San Gerónimo, Guerrero. In addition to these described species specimens of an apparently undescribed species are reported from Cueva de la Mina, Tamps. The evolution of the group is discussed.

- Rowland, J.M. 1973. A new genus and several new species of Mexican schizomids (Schizomida: Arachnida). *Occ. Pap. Mus. Texas Tech Univ.*, 11. 23 pp.

In addition to three epigean species this paper includes the description of three new Mexican cavernicole schizomids. *Schizomus bartolo*, n.sp., is described from Gruta de San Bartolo, Nuevo León; *S. firstmani*, n.sp., is described from Grutas de Atoyac, Veracruz; and *S. pecki*, n.sp., is described from Grutas del Coconá, Tabasco. It is speculated that *S. bartolo* and possibly *S. firstmani* are troglobites.

Russell, Bill. 1973. Mexico: What needs to be done. *Texas Caver*, 18(2):42-44.

This is a list of projects which need to be completed or initiated in northeastern México and specifically in the following areas: Sierra de El Abra, Sierra de Guatemala, Tamasopo Region, Ciudad del Maíz Region, Aquismón Area, and Xilitla Area. Included are areas needing to be investigated and caves needing to be mapped, located, or remapped.

Russell, Wayne. 1973. Caves - 50 km into Mexico? *Texas Caver*, 18(4):117.

This brief article speculates on the caving potential of the area in Coahuila, México, immediately south of Langtry and Comstock, Texas. The absence of roads and people is mentioned as reasons for our lack of knowledge of this promising area.

Russell, Wayne. 1973. TCTTNSHB. *Texas Caver*, 18(2):31-34.

The title of this article means "The Cave Trip That Never Should Have Been." It is an account of a mass disorganized and potentially disastrous trip to Sótano de Vásquez, Tamaulipas. It emphasizes the need for extra care and small, tightly organized groups in the exploration of a large Mexican pit.

Shawcross, Mike. 1973. Deep caves of the World. *Canadian Caver*, 5(1):61.

This list of the 31 deepest caves of the World, as of January 1, 1973, includes Sótano de San Agustín, Oaxaca, México, which is 2009 ft (612 m) deep. It is number 31 on the list.

Tracey, A.G. 1973. Sumidero de Tenejapa. *Canadian Caver*, 5(1):44-48.

This article is an account of the exploration of one of the many remarkable river caves of Chiapas. Sumidero de Tenejapa was surveyed for a total length of 4351.6 ft and a depth of 687.2 ft. Included is a fold-out map of the cave.

Walsh, Mike. 1973. Real de Catorce. *Texas Caver*, 18(1):6-7, map.

The potential of the well-known mining town of Real de Catorce, San Luis Potosí, discussed in this article. One cave at the 108 m level of the Santa Anna mine was visited and the 800 m long La Cueva-Mina del Real de Catorce is described. This tunnel-like cave, largely modified by mining activity is also used as a sewage drain. A map of the cave is included.

Walsh, Mike. 1973. Texas Caver interviews AMCS. *Texas Caver*, 18(4):110-113.

This is an interview with AMCS Publications Editor Terry Raines. The interview emphasizes the aims and future plans of the Association for Mexican Cave Studies.

Wilkens, Horst. 1973. Über das phylogenetische Alter von Höhlentieren. Untersuchungen über die cavernicole Süßwasserfauna Yucatans. *Z. f. zool. Systematik u. Evolutionsforschung*, 11(1):49-60.

The degree of reduction of the eyes and pigment of three cave-dwelling Yucatán teleosts (*Thyliasina pearsei*, *Furmastix infernalis*, *Rhamdia guatemalensis*) and a shrimp (*Creaseria morleyi*) are compared. The troglobites of marine derivation (*T. pearsei*, *C. morleyi*) show most reduction. Whereas *F. infernalis*, a secondary freshwater fish, has an intermediate position, *R. guatemalensis*, a primary fresh-water fish, shows hardly any reduction. The evolutionary significance of this is discussed and compared.

son with the cave-dwelling populations of the blind fish *Astyanax mexicanus* is made.

Wygodzinsky, Pedro. 1973. Description of a new genus of cave thysanuran from Texas (Nicoletiidae, Thysanura, Insecta). *American Mus. Novitates*, 2518. 8 pp.

A new genus *Texoreddellia*, is erected for the common Texas troglobitic thysanuran, *Nicoletia texensis* Ulrich. This species has been reported from Grutas de Quintero, Tamaulipas, but the author of this paper questions the identity of these specimens.

REVIEWS

Karst; Important Karst Regions of the Northern Hemisphere, edited by M. Herak and V.T. Springfield. Elsevier Publishing Co. 1972. 551 pages.

The book opens with a brief review of morphogeologic and hydrogeologic concepts, beginning with Aristotle and continuing to the present. No conclusions are reached regarding either karst morphology or hydrogeology. Following this introductory material are chapters on the karst of Yugoslavia, Italy, France, Germany, Austria, Hungary, Czechoslovakia, Poland, Rumania, USSR, Great Britain, Jamaica, and the United States. Maps of the distribution of karst are included for all countries except Czechoslovakia and the USSR, and a map of eastern Czechoslovakia is included showing all karst areas mentioned in the text. For each country there is a discussion of most of the major and many of the minor karst areas, frequently enhanced by photographs and geologic cross sections. This book is a valuable reference for anyone interested in the distribution of karst; however, the large number of individual karst areas described force the authors to give much of the space to the geographical distribution of individual areas, leaving less room for information on landforms and karst processes.

The great advantage of having descriptions of many karst areas conveniently gathered in one source should be to facilitate comparison between areas, making it possible to evaluate the effects of climate, stratigraphy and structure. All of these factors are complex, and adequate descriptions of any karst area would require several pages on climate and geology. Unfortunately, in the present volume much crucial information on individual karst areas is omitted, probably due to lack of space. Typical are the four pages devoted to the Pyrenees in southern France. One page is a cross section of Pierre Saint-Martin and Gouffre Berger (the influence of the underlying impervious rocks is not shown). The other three pages outline the distribution of local karst areas: Corbieres, Sault, north Pyrenean, high Pyrenean, and Basque country. Very brief descriptions are given of several caves, and there is a brief enumeration of landforms, with one paragraph on the stratigraphy and two on structure. No climatic data is given, hydrographs or even average spring flow, and there is no chemical data as to hardness of water. Not indexed under Pyrenees and many pages away in a separate section—because the karst is developed in Paleozoic rather than Mesozoic limestone—are two pages on the karst of the Conflent area in the eastern Pyrenees.

The authors' ambitious attempt to cover "Important karst regions of North America" means that many important karst areas are starved for space. Other areas are often given a superficial treatment by authors not familiar with the region, leaving an erroneous impression in the mind of the reader. México, which has important karst regions in several climatic zones, is dismissed as follows (p. 11): "Investigations have been made in all the karst areas in warm and humid climates. In addition to Java and Jamaica where

already in the past investigations had been made, karst areas of southern China, Indo-China, Celebes, Puerto Rico, Cuba, Yucatan, Mexico, etc. have been studied. The karst of all these areas is characterized by isolated steep hills ("mogotes" in Cuba)." Yucatán is part of México and its karst is not characterized by isolated steep hills. Most of the karst of México is at higher elevations with a temperate climate and mogote type hills are rare. Tabasco has probably the only 'typically tropical' karst in México. In the description of the Edwards Plateau of the United States, Davis reports (p. 503) that "In the valleys cut into the margin of the plateau, broad solution depressions are common at the junctions of tributaries." These features are not known among those familiar with the area. Davis also states (p. 503) that "limestones adjacent to the south and eastern boundaries of the Edwards Plateau cover about 40,350 km² and more than 600 caves occur..." He apparently means the northern and western boundaries, as limestone is not exposed to the south and east of the Edwards Plateau. A table (p. 472) lists deep shafts as a characteristic of the Edwards Plateau. There are only 5 shafts over 40 m deep known in the 50,000 km² of the Edwards Plateau. I hope that the authors in other countries did not feel the necessity to comment on areas in which they had not worked to "complete" the description of karst in their country, but I feel that assigning an author the karst of an entire country tends to force him to comment on all karst areas, including those with which he is perhaps not familiar. Tighter editing could have also eliminated with profit several of the space-consuming lists, such as the list of 60 French authors "who have worked or still are working on karst."

This book performs a useful purpose in bringing together a vast amount of information on the karst of the countries it covers. If one is interested in the karst of Russia, this would be a good place to start. If one has wondered whether the classic karst of Yugoslavia is more spectacular than the familiar karst of his home region, this book would probably answer his questions. But the karst worker who would like to compare solution rates in karst areas of different temperature, soil cover, and rainfall will find that much of the essential data has not been included. Perhaps in the future a series of books using this book as an introduction could be published, giving detailed information on individual karst areas.

Spelaion, año 1, n. 1, May 1973. Grupo de Investigación Espeleológica, México. 19 pp.

This is the first issue of the official publication of the newly organized Mexican speleological group, El Grupo de Investigación Espeleológica. The first issue includes an editorial explaining the goals of both the Grupo de Investigación Espeleológica and of *Spelaion*. This is followed by a translation of a section from E. A. Martell's *Los Abismos*. Other articles include an account of diving in the Grutas de Juxtlahuaca, Guerrero; a brief discussion on speleogenesis; a diagram of a respirator to be used to avoid inhaling histoplasma spores; and a brief account of the activities of the organization. The bulletin contains an attractive color photograph on the cover and the printing is generally good.

It is exciting to see the appearance of a Mexican caving publication. It will hopefully help to fill the vacuum in Mexican cave publications by the Mexican speleologists. We sincerely hope that it will stimulate interest in caving in México by Mexicans, as well as inspire serious scientific study of Mexican caves. We wish *Spelaion* the best of luck and eagerly await future issues.

ASSOCIATION FOR
Mexican Cave Studies

NEWSLETTER

Volume IV Number 4

April 1974

NEWS AND NOTES

AMCS POLICY ON ARCHEOLOGY

TRIP REPORTS

Cueva de la Sierra Partida
Gruta del Palmito and Vicinity
Gruta del Precipicio
Saltillo
Bustamante Canyon
El Cercado
Gruta del Precipicio
Yucatán
Sierra de El Abra
Gruta del Palmito
Aquismón Area
Gruta del Palmito

ARTICLES

Aboriginally Occupied Caves in the Sierra de El Abra
Biological Hazards to Mexican Cave Exploration
The Illusive Pit
Cueva de Juan Amaro
Cueva de los Secundarios
Cueva de los Secundarios: Supplementary Description
Another Histoplasmosis Cave
Mollusks Found in Caves near Tlamaya, S.L.P.
Notes on Caves in Chiapas, México, and Guatemala

RECENT PUBLICATIONS ON MEXICAN SPELEOLOGY

Abstracts

The Association for Mexican Cave Studies
is a non-profit organization
whose goals are the
collection and dissemination
of information concerning
Mexican caves

The AMCS publishes a Newsletter
Bulletin and Cave Report Series
which are available
to any sincerely interested
conservation-minded person

The AMCS Newsletter
is published six issues per volume
as frequently as necessary
at a cost of \$5 US per volume.

Information concerning
the other publications
is available upon request

Potential contributors are urged
to submit articles for publication

The article may cover any phase
of Mexican speleology

Trip reports are requested
from all trips

All correspondence
and orders for publications
should be sent to

Association for Mexican Cave Studies
P O Box 7037

Austin, Texas 78712 USA

Material for publication
in the Newsletter
should be sent to

James Reddell or William Elliott
Association for Mexican Cave Studies
Dept. of Biology, Texas Tech University
Lubbock, Texas 79409 USA

Publications Editor Terry W. Raines
Newsletter Editors William R. Elliott
James R. Reddell

Cave Files William H. Russell

Secretary-Treasurer Jan E. Lewis

Coordinating Biologist James R. Reddell

Graphics Consultant Chuck Bryan



THE SPELEO PRESS

Austin

=====

ASSOCIATION FOR

Mexican Cave Studies

=====

NEWSLETTER

Volume IV Number 4

April 1974

NEWS AND NOTES

AMCS POLICY ON ARCHEOLOGY

TRIP REPORTS

Cueva de la Sierra Partida
Gruta del Palmito and Vicinity
Gruta del Precipicio
Saltillo
Bustamante Canyon
El Cercado
Gruta del Precipicio
Yucatán
Sierra de El Abra
Gruta del Palmito
Aquismón Area
Gruta del Palmito

ARTICLES

Aboriginally Occupied Caves in the Sierra de El Abra
Biological Hazards to Mexican Cave Exploration
The Illusive Pit
Cueva de Juan Amaro
Cueva de los Secundarios
Cueva de los Secundarios: Supplementary Description
Another Histoplasmosis Cave
Mollusks Found in Caves near Tlamaya, S.L.P.
Notes on Caves in Chiapas, México, and Guatemala

RECENT PUBLICATIONS ON MEXICAN SPELEOLOGY

Abstracts

NEWS AND NOTES

Believe it or not, there are now three registers at the bottom of El Sótano.

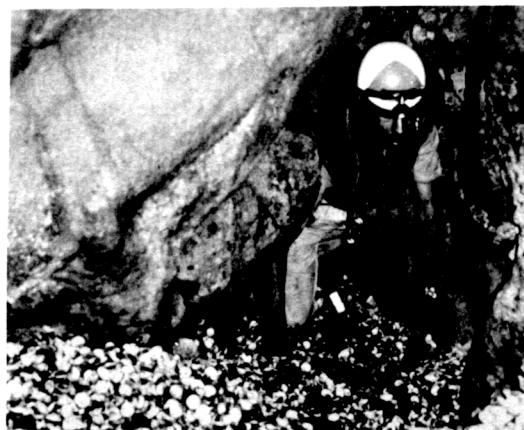
A trip to Orizaba and surrounding countryside was made over the Christmas holidays by William Elliott, Roy Jameson, David McKenzie, and James Reddell. One of the principal goals of this trip was to enter some of the previously explored and mapped caves near the epicenter of the great earthquake which hit that area in August. A careful check of Cueva del Ojo de Agua de Tlilapan (see AMCS Newsletter, IV, 3, p. 94), at Tlilapan, about 6 km S of Orizaba, was made. This cave had been mapped in March 1973 and contained large rooms with much breakdown and ceilings with much poorly-cemented conglomerate. It was felt that if any cave had suffered damage it would be this one. The examination, however, showed no evidence of the effect of the earthquake on it. Other caves in the same area also showed no ill effects from an earthquake which caused massive damage to structures and great loss of life in the nearby cities of Orizaba and Cd. Mendoza.

A newspaper clipping was reprinted in the AMCS Newsletter, IV(2):46, which described a great cavity which had opened near Acatlán de Pérez de Noriega, Oaxaca. It was reported to be 30 m in diameter and 90 m deep and to have caused great alarm to local inhabitants. Furthermore it contained an underground river. The same group who visited Orizaba (see above) also investigated this "enorme grieta" only to find a dirt sink 7 m deep, 22 m long, and 13 m wide and completely dry. Furthermore, although it seems to have aroused some curiosity, the local inhabitants showed no undue alarm. Although it may have possibly been caused by the earthquake it may just as well have been a result of the heavy floodings which had occurred a short time prior to the earthquake.

Peter Sprouse is gathering material for a report on the Aquismón Area, San Luis Potosí. Anyone who has visited this area and who has maps, cave descriptions, trail logs, etc., should get in touch with him in care of the AMCS. His report will be an issue of the Cave Report Series.

CORRECTIONS: Unfortunately the names of the authors of the two reviews included in AMCS Newsletter, IV(3):108-109, were omitted. The review of *Karst; Important Karst Regions of the Northern Hemisphere* was by William H. Russell. The review of *Spelaion*, año 1, n. 1, was by James Reddell. The map of Sótano de El Porvenir, Tamaulipas, which was to have been printed on page 85 of AMCS Newsletter, IV(3), did not reach the printer in time to be included. It is included in this issue on page 125.

As the accompanying photograph shows the crawlway to the lower levels of Pozo Melendez, Guerrero, is now plugged by bottle caps. A recent trip by Sergio Zambrano found this situation. The cave has been used by a company in Taxco for dumping their old bottle caps.



AMCS POLICY ON ARCHEOLOGY

The following article by John Greer on the archeology of the Sierra de El Abra, San Luis Potosí, is the initiation of a series of articles describing reconnaissance surveys of various caves of potential archeological importance. This is done by the AMCS with some reluctance, but considering the possible importance of the information it is felt to be worthwhile. It should be noted here, however, that the AMCS in no way condones, supports, or in any way advocates the UNAUTHORIZED EXCAVATION OF ANY CAVE in México. Nor do we support the removal for any reason of archeological artifacts, whether they be pottery shards, figurines, or projectile points. No archeological site should be disturbed in any way whatsoever. The finding of a skull or pottery fragments may tempt one to dig around in the hope of finding more material. This type of random pot-hunting may completely destroy the site's value to the archeologist or paleontologist who wishes to study it. Many caves in México contain archeological remains, many contain pictographs and petroglyphs, many contain skeletal elements. The caver who makes notes of the material lying on the surface, who photographs and/or sketches it and the pictographs or petroglyphs, and who relays this information to qualified archeologists or to the AMCS will provide extremely valuable information which could lead to a significant discovery. The caver who digs around in the cave floor, who pockets a figurine, or who brings a skull out of the cave damages a potentially valuable site, may very well cause ill will among the local people, and risks arrest, imprisonment, and heavy fines.

The present law on antiquities in México is extremely stiff. A summary of part of this law is given here:

(1) All archeological property belongs to the nation (i.e. México). Archeological property is defined as "all goods, movable or immovable, products of the cultures in the national territory that preceded the establishment of hispanic culture, as well as the human, floral, and faunal remains related to them." They cannot be transported, exhibited or reproduced without permission.

(2) Unauthorized digging is punished by from 1-10 years in jail and a fine of 100-10,000 pesos. Trading in artifacts has the same jail penalty but a fine of 1000-15,000 pesos. Illegal possession of antiquities can be punished with 1-6 years in jail and a fine of 100-50,000 pesos. Illegal acquisition has a penalty of 2-10 years and a fine of 3000-15,000 pesos. Malicious damage is punished by 2-10 years and a fine for the value of the piece. Illegal export can be punished with a jail sentence of 2-12 years and a fine of 100-50,000 pesos. Any other infraction, not considered specifically, is punishable with a fine of 100-50,000 pesos.

(3) The penalties will be graduated according to the education, moral standing, and economic conditions of the delinquent and his motives to protect farmers and laborers acting from need or ignorance.

Furthermore United States customs have begun to cooperate with the Mexican government in an attempt to halt the flow of artifacts from México to the United States.

From the above it can be seen that the caver who is tempted to remove artifacts from the cave risks a great deal should he be caught. In addition to this anyone who is known to be involved in unauthorized digging or removal of artifacts can expect no further information from the AMCS. It is one thing to make the kind of survey which John Greer has done on the Sierra de El Abra (that is to say, a recording of facts by a trained archeologist without disturbing in any way the sites) and it is entirely another to carelessly destroy a site in the search for "arrowheads" or "idols". The first makes a real contribution to our knowledge of caves; the second prevents us from ever learning more about the use of caves by earlier peoples.

—James Reddell

TRIP REPORTS

Date: 17 May 1973

Destination: Cueva de la Sierra Partida and Sótano de Vásquez, Tamaulipas

Persons: Edna Garcia, Paul Duncan, Jimmy Clements, Amador Cantu, Pete Strickland, Glenda Dawson

Reported by: Glenda Dawson

Edna Garcia, Gandalf, and four fellow cavers (one from Austin) decided to end the “año de escuela” right with a trip into Mexico especially to explore the Ocampo area. We had heard from Amador about a long train tunnel-like lava tube there (volcano at Ocampo?) and we wanted to check it out and get it mapped in time for Convention. So we trucked on down via Pete’s Power Wagon. After parking and much cussin’ and discussin’ over which cow path to follow and following the wrong ones we made our way to the volcano. Looked at the tube but didn’t go in until the next day. Next day we explored and mapped it. It was something like mapping a subway tunnel—about 3 m high by about 3 m wide with some very large roomy areas by about half-a-mile long. This was broken into three sections by openings to the surface where the roof had collapsed. (It even had lava ripples on the floor suggesting railroad tracks). The third breakdown area blocked the last section of the tube but we dug an opening and the last section completed the record length. It finally narrowed to a wide but very low passage (about 7 inches high) so we stopped.

After a day or so of fooling around we dropped one of our group at the bus station and went to do some collecting in Vásquez. We had to go to the lake so we only got a chance to see the downstream section of the cave. It consists of a series of drops (yes you need a lot of rope) to a chimney which opens to a large room. The drops ranged from 30 to about 100 ft (not including the entrance drop of 360 ft) and the chimney is actually a huge crack in the ceiling of the bottom room which you rappel into (about 120 ft) from the crack. The bottom is all black mud which slopes up the local bat hangout or is it hangup, and slopes down to a lake which is chuck full of blind cave fish. We had to wade it to finish mapping and to do some collecting. The lake bottom is slimy mud and debris which comes up to about the knees and releases methane bubbles when stepped in. As far as we can figure the cave ends with lake.

We rested and left—it seems that going in was easier than going out because it had been downhill all the way in. We got out about sunrise and I was serenaded while going up the entrance drop by Pete—a perfect finish with music to climb ropes by.

On the way home we visited Huasteca Canyon for a night (far out place) and then came back to all sorts of technological living. Amen.

Date: 20-21 October and 10-11 November 1973

Destination: Gruta del Palmito and Vicinity, Bustamante, Nuevo León

Persons: Ernst Kastning, Charles Fromén, Mike Hanks, Theresa Morris, Claude Penny, Mike Connolly, Ransom Myers

Reported by: Mike Connolly

The first trip was intended as a Greater Houston Grotto outing to Gruta del Palmito since several of the members had never visited this cave. The trip started normally with an enjoyable walk up the switchback trail in the coolness of the morning. There were several Mexicans talking with the regular guide when we arrived at the entrance, and after a few photographs, conversation turned to the possibility of other caves in the vicinity.

In halting Spanish it was learned that the old man talking to the guide made his living by gathering palmetto fronds from the mountainside. He claimed to know of several caves in the vicinity, including one which was deep and 'dark'. He could not at the moment guide us to the spot since it would take him from his work, but he finally agreed to go part of the way and give directions. Since no one knew of how reliable this fellow might be it was decided that two cavers would go to check this lead while the others visited the GdP.

Charles and Mike Hanks set out with the old man who had introduced himself as Señor Rodriguez. The remainder of the group entered the cave where they spent about eight hours taking photographs. On their way out they encountered Charles and Mike near the top of the breakdown slope, returning from an unsuccessful cave hunt. It was decided to camp in Bustamante canyon and to look up Sr. Rodriguez the next day in town.

Sunday morning, after considerable difficulty, Sr. Rodriguez' house was finally located. His description of the terrain near the cave had closely coincided with that encountered by Charles and Mike on their climb and after considerable discussion it was concluded that they had misinterpreted his directions regarding the final 100 meters or so to the cave. Further interrogation elicited glowing descriptions of the cave, including that the mouth was six meters across, there was a drop of uncertain distance (maybe 60 meters) and that clouds issued from the mouth in cold weather. Some of those present wondered how much of this glowing description might be due to leading questions posed by a certain caver the previous day, but kept these questions to themselves. The trip back to Houston was made amidst excited speculation by a certain caver, and planning of a return trip for several weeks later.

The second trip was well planned. The arrival of cavers was heralded by a letter sent from Charles Fromén to Sr. Rodriguez a week in advance of the second coming. The cavers arrived in front of Sr. Rodriguez house early that cold drizzly Saturday morning and the mountain man was waiting. The cavers spirits sank, however, when he insisted that conditions were too dangerous to reach the intended objective (rain and low visibility) and that he would show them several caves containing Indian pictographs and 'gold coins' instead. After hasty consultation, the group set out for the parking lot hoping to change their guide's mind on the way.

Considerable discussion took place at the parking lot with the cavers trying to persuade their guide to lead them to the original objective. He remained adamant, however, and finally explained that he had climbed up to the cave several days before and that it was not actually as good as he had remembered. He would be very happy to lead them to some caves in another location that he was sure were much better since they were known to contain gold and money.

As this discussion continued a mood of doom and despair gripped most of the group, but a certain caver insisted on climbing the mountain to find the cave. Insisting that the cave must be a good one and that our guide was only degrading it because he didn't want to hike up there, he headed up the trail. The others held back, however, listening to Sr. Rodriguez and beginning

to believe that the course of action he recommended might have merit. That certain caver, however, was not to be restrained and after 45 minutes of haggling the rest of the group (less the guide) followed him up the trail, with thoughts of previous ordeals racing through their heads.

After several hours of climbing and hiking over slippery limestone the dauntless explorers reached the area where the cave was supposed to be located. With visibility at 20 feet Mike Hanks set out to build a fire while the others searched for the cave and for firewood. Mike extracted some type of magical substance from his pack and was miraculously able to kindle a fire from the wet firewood. This provided an opportunity for the cavers to dry their clothes and warm their bodies before exposure became a problem.

In the meantime Charles had located the cave; an insignificant hole, precisely as described by the would-be guide several hours before. When clothing had been dried substantially, the group had a few morsels of nourishment provided by Mike Hanks. It was then necessary to begin the descent immediately in order to find the trail before dark. They arrived at the parking lot without mishap despite the treacherous conditions and the fact that night had fallen while they were still on the mountain. So ended one more of the great searches.

—Reprinted from *The Texas Caver*, 19(1):12-13.

Date: 2-4 November 1973

Destination: Gruta del Precipicio

Persons: Amador Cantú, Juan Menchaca, Ken and Karen Kreekmore, Jim Clements, Paul Duncan, Wayne and Debbie Klempke, Glenda Dawson

Reported by: Glenda Dawson

Again, a trip to Bustamante Canyon. Left Friday with Clements and Duncan picked up by Tom in Kingsville. Only took an hour to get across the border (no, the officials are by no means fast). Arrived late in the Canyon. Total of 3 vehicles and 13 bodies showed. Arose at the crack of dawn in order to get as far up the mountainside as possible before the sun caught up with us. Clements, Duncan, and I got there last—I gave Clements the royal tour to the first drop—all the while convincing him that we were going to my wine cellar (I'm not sure he fell for it). Emerged from the safety of the cave to watch a magnificently colored sunset (varied soft but very deep pastels—beautiful). Waited for dark and on signal provided those below with fireworks (see, it *is* handy having a wizard along). Must've been quite a sight for the cave is located about 400 ft up a cliff. I understand there were two 'sauced' locals trucking (literally) along the canyon road who saw the firework—immediately stopped their vehicle and proceeded with immediate repentance of all their wrongdoings. It lasted about an hour (the fireworks display). Next day we started down going by way of an arroyo which is directly south of the ridge we went up on. Ran into a small cave (about 30 ft with some flowstone) on the way down. Made it in good style and swam our aches and pains away (except for being swept over the waterfall). Went into town and had a good meal—went home—ran into a very friendly border guard—made the search a little nicer—Thanks-giving here we come.

Date: 21-25 November 1973

Destination: Mountains east of Saltillo, Huasteca Canyon, Nuevo León

Persons: Neal Morris, Barb Vinson, Terry and Nancy Sayther, Pat Asnes, Craig Bittinger

Reported by: Craig Bittinger

We left Austin at 6 p.m. Wednesday and arrived in Sabinas Hidalgo at 1 a.m. The border took about two hours but involved no hassles. We proceeded to sleep at the Ancira Restaurant

while we waited for the other car of cavers, including David Backer, Peter Sprouse and Greg Walker. We awoke at 5 a.m., left a note on the door of the restaurant and proceeded to leave while wondering what had happened to the other car. By 9 a.m. we were at the parking spot in the mountains east of Saltillo.

Donning our packs, we followed Neal up the trail. Two hours of strenuous hiking brought us to the steep mountains we were to climb. We would hike 50 feet, rest, and then repeat the process up the mountain. Sitting to rest could be dangerous because of the slope's steepness. During one rest break I slid five feet back. Finally, at 4 p.m. we made it to the top at 11,500 feet. We had gained 5,000 feet in elevation after a sleepless night on the road and we felt it. Spirits were high around the campfire in the pines as we supped on Lipton's best, popcorn and chocolate pudding. The next morning the sun came out and we set out to find new caves.

We located four caves and mapped one about 300 feet long and 100 feet deep. Unfortunately these weren't the caves Neal had seen previously. We all enjoyed the fantastic view down into the valleys on both sides of us. The hike down lasted until dark. When we arrived at the truck, we fixed supper and went to sleep while 20 Mexican children watched. They admitted that it was better than the circus.

The next morning we drove through the canyons to Monterrey. Huasteca Canyon was in flood and four-wheel drive was necessary to traverse the road. A Mexican foot-soldier raced us through the canyon and held his own for about eight miles until he met his buddies. They were busy pointing machine-guns at us and pumping water up from the depths and into the creek bed so it wouldn't dry up. We were sad to arrive in Monterrey because of the smog.

Proceeding to Bustamante, we ate and met Fred Paschal at the canyon entrance. We followed him to the canyon near El Alamo and met the owner of the canyon on a one-lane road, getting the Mexican standoff. After a night's rest, we journeyed up to the springs where the canyon water emerges. Our guide enchanted us with tales of finding buried money and local Spanish ruins. Crossing the border was easy but getting to it took two hours.

—Reprinted from *UTG News*, 6(4):8.

Date: 21-25 November 1973.

Destination: Bustamante Canyon, N.L.

Persons: David Backer, Peter Sprouse, Greg Walker.

Reported by: Peter Sprouse.

Wednesday night a long line of turistas was encountered at the border, many of whom were scruffy, dirty types who we suspected were fellow cavers. Thus it was 4 a.m. Thursday before we were on the road again, heading from Sabinas Hidalgo, which was to be a meeting place with the other half of our group going to the highlands east of Saltillo. Arriving at the rendezvous point, we discovered the other truckload of cavers had left 15 minutes ahead of us. Off to Saltillo, where we again failed to make contact. After a three-hour wait in the town square, we elected to head north to the Bustamante Canyon area.

We arrived in Bustamante about 1 p.m. and drove on through the canyon to the desert west of it. We then drove south through the desert looking for a good section of the mountain to look for caves. Aiming for what looked like a possible huge sinkhole on the summit, eight miles south of the canyon gap, we only got five miles south of the gap before our road ended near the base of the mountain at a small rancho. Here lived an old man, known only to us as "the señor," who told us of a cave in one of the valleys cut into the mountainside near his home. He also told us of some more caves he knew of farther away which we didn't search for due to lack of time.

The next day (Friday) we went in search of the cave the señor told us of. After fighting

cacti up the valley's steep sides all morning, the señor's goatherder showed us the way to the cave. The entrance, ten by eight meters, was hidden by palm trees at the base of a cliff. Thusly it earned the name Cueva Escondida. Just inside the entrance, under a magnificent 30-50 meter ceiling, were the diggings of Mexican miners, presumably saltpetre works. On the walls, mixed with recent graffiti, were many Indian pictographs. These were copied by David for further study. Also found were several potsherds, but these looked to be of fairly recent origin.

The huge passage beyond unfortunately ended after 75 meters. Exploration of side passages and lower level crawls produced another 75 meters.

While cooking breakfast the next morning (Saturday) in the desert, we spotted an entrance about 1.5 miles north of the canyon. We hiked through the desert to find that the entrance, 15 meters by 8 meters, was basically a shelter cave with only 10 meters of passage.

That afternoon we felt a desire to spend an extended period underground, so we visited Gruta del Palmito, which was quite an experience, as none of us had been there before.

There are still a lot of discoveries to be made in the Bustamante mountain range. More emphasis should be put on looking for new caves there than on repeated trips into Palmito.

—Reprinted from UTG News, 6(4):6-7.

Date: 22-25 November 1973.

Destination: SMO southwest of El Cercado, Nuevo León.

Persons: Theresa Morris, Charles Fromén, Susey Fromén, Mike Connolly.

Reported by: Mike Connolly.

This trip was primarily intended as an attempt to push past the log jam that blocks Sumidero de la Cebolla. This cave is located on the outskirts of La Trinidad, N.L., and is reached via the road from El Cercado above Horsetail Falls. The cave had been surveyed as far as the log jam (about 175 m) on previous trips, but attempts to push over, around or under this obstacle had been fruitless. The local people claim that water entering the cave exits from a cave on a canyon wall about 1.5 km away.

After reaching La Trinidad, the cave from which the water exits was located with the aid of the local people. First-hand inspection revealed that the overhang of the cliff would make rapelling in from above very difficult, if not impossible, and that the route from below would involve technical rock climbing of the waterfall issuing from the cave. It was decided to work on the log jam in the upper entrance; but this effort was abandoned after an hour or so of very little progress.

Two previously unchecked sinks along the road from La Trinidad to Potrero Redondo yielded horizontal passage of about 100 m each, and the night was spent near Potrero with the intention of surveying Gruta Tierrosa. Evidence of a previous survey was found in this cave although none of our group has visited it since 1971. Efforts at further exploration of the water passage were discouraged by the coldness of the water. This factor has hampered exploration of other caves in this area so taking wetsuits to México may be in order.

At Laguna de Sánchez the valley was found to be fully drained from the floods of the summer. When visited in July of this year the lower end of the valley near town had been under as much as 2 m of water. After considerable walking about in the mud-covered fields, we located the "pozo" that drained the valley. Much to our surprise it looked like a classical water well, about 0.8 m in diameter with stone masonry sides. It was, however, taking a large volume of water from a ditch cut across the fields of the valley. Inquiring of the locals it was learned that the stone walls had been added to guard against washing in debris, since the people understand only too well the function that the pit plays. Their description varied from 20 to 30 m

of depth with horizontal continuation at this level of too small a size for a man to fit through. None of the locals seemed to know where the water goes, although there is a spring a mile or so below town which may act as a resurgence.

—Reprinted in part from *The Texas Caver*, 19(2):31.

Date: 8 December 1973

Destination: Grutas del Precipicio, Bustamante, Nuevo León

Persons: David Brantley, Tom Addison, Dionicio Vasquez

Reported by: D. Brantley

....We hiked up the rock slide and got up on the ridge. The ridge is very easy to climb due to its step-like features. About two-thirds way up, the ridge has a cliff that appears to have no place to climb up. We used ropes at this point, but I suggest going to the right until it is climbable to save time. One main point I would like to express is stay on the rock as much as possible, because the brush will eat you up. Once on the ridge we stayed on it until we reached the top. At the top of the ridge there is a good trail with only about a 15 degree incline. We followed the Precipice around until we came to the little slope going down and around to the face of the Precipice where the cave is located. The slope is safe, but be careful, one slip, and you create a man-made hole at the bottom of the Precipice.

When you finally get into the cave you feel more secure. Tom wanted to check out the caves below Precipicio, so we put down a 245 ft rope, tied to a rock inside Precipicio. He took another 200 foot rope down, because of a report that it was over 300 feet, but he didn't need the extra rope. I didn't go down because I felt just a little chicken. Tom got some great shots with his camera in the lower caves. The best shot of all was the one he missed of his face at the top of the rope when he dropped his hundred and fifty dollar camera about 400 feet straight down. The lower caves are not worth the trouble unless you like the rope work, according to Tom.

We went back to the first drop with very little difficulty. There are a few ups and downs getting to the first drop, but nothing difficult. A 200 foot rope is sufficient for the drop. There is a large rock at the mouth of the drop to tie to. It doesn't look safe, but still we have used it twice with no problems. There are a few ledges as you go down. One is large enough to rest on. You could unhook and adjust your equipment if necessary. We got to the bottom of the first drop, and faced the wall we had just descended on. We went to our right until we came to a large cavern that drops down about 50 feet. A rope about 150 ft is needed for this drop due to the tie off point. We descended on the left side (facing the room) because there is a lot of loose rock on the right, big enough to wipe you out if they should work loose. After our descent, we climbed a huge pile of breakdown to an opening near the top. Until this point, the cave was beautiful, but the sight at the top was simply indescribable. It is one of nature's finest works of art. The formations formed and designed by nature, not one of them looking like the other. The architecture features are unbelievable. The ceilings are supported by huge columns strong enough to hold up the world. Stalactites hang from the roof of the cavern up to 30 ft in length. We admired the beauty within the cavern and investigated every opening we could; large or small. It's a sight that nature created, but God only gave a few us fools the ambition to see. I guess he gave others brains.....

Date: 18 December 1973 - 2 January 1974

Destination: Yucatán

Persons: Ron Ralph, Pamela Lynn, Terry Sayther, Chuck Kennedy, John Davies

Reported by: Pamela Lynn

Caving on this trip involved visiting three caves in Yucatán—Grutas de Balankanche (a quickie trip), Spukil (very confusing), and Loltún (very impressive.)

Grutas de Balankanche is near the site of Chichén Itzá and costs three pesos. The main interest is not the cave itself but the beautiful pottery excavated there.

Spukil is near the town of Muna and has recently been explored and photographed by David McKenzie. The cave is a huge maze with broken pottery and metates scattered throughout. We didn't have a map and ended up going in circles for several hours without ever finding the main passage.

Loltún is near the town of Oxkutzcab (Loltún means Stone Flower in Maya). The cave has several huge skylights, pictographs, petroglyphs, a couple of rough altars carved from natural rock, a stalagmite that has grown like a water fountain with cold sweet water, a ceremonial bath with carved steps, and many fine formations. Without our guide, who was very knowledgeable and also spoke some English, we would have missed many of these features, so the \$5.00 (U.S.) he charged was definitely worth it.

The rest of the trip was spent visiting lots of Maya ceremonial sites (Palenque, Labna, Tulum, etc.).

—Reprinted from UTG News, 6(4):9.

Date: Christmas 1973

Destination: Sierra de El Abra, San Luis Potosí

Persons: Cavers from four nations

Reported by: William H. Russell

Cavers from four nations camped at the Los Sabinos campground during the 1973 Christmas season. Among the notables was Paul Courbon from France, author of *Atlas des Grands Gouffres du Monde*, an atlas of maps and descriptions of the deep caves of the world. He planned to visit Sótano de las Golondrinas to see personally if it was the world's greatest pit. Also present was Peter Lord, an English caver touring the caves of North America, and Eduardo Castro, the second Mexican to do Sótano de las Golondrinas. Eduardo hopes to form a national organization similar to the National Speleological Society to include all the various groups interested in Mexican caving.

The first objective for most Austin cavers was the high part of the Sierra de El Abra north of Cd. Valles, S.L.P. Many of the caves in this area had only recently been discovered. The largest, Sótano de la Cuesta, a 570-foot drop into a large room, had only been entered last Christmas. The advance group of Neal Morris and Barbara Vinson had arrived in Valles Dec. 20. Neal and Barbara then walked up to the base camp at Cueva de Tanchipa and surveyed 60 stations on the map of that cave, and then returned to the highway clearing and marked the trail. Jim Moore, Craig Bittering, and Bill Russell arrived in Jim's VW on the evening of Dec. 22 and waited in Valles for Ronnie Fieseler, Susan Fieseler and Jim Goodbar to arrive on the bus. When they arrived we rode out to Los Sabinos with our packs and rested. The next afternoon, Peter Strickland arrived in his truck with Peter Sprouse, Cindy Kane, Steve Zeman, Dino Lowery, Larry Wigginton, Logan McNatt, Ivy Abbingtion and Dave Hutchings. Peter's people went into town to eat and the rest loaded into Jim Rodemaker's and Marion Smith's four-wheel-drive pickups for the ride to the base of the mountain. Toward the end, the road was rough and everyone walked, but at least they didn't have to carry their packs until the end of the road. Peter Strickland's alternator ceased to function on the way to the base of the mountain, so those in his truck didn't arrive at Cueva de Tanchipa until the evening of Dec. 24, after walking from the highway with full packs. The two gallons of water each person needed to carry didn't make the packs lighter. Everyone spent Christmas eve in the jungle-shrouded shelter-like entrance to Cueva de Tanchipa.

Christmas Day some cavers explored in Cueva de Tanchipa where Ron Fieseler and crew had blasted through a small hole the day before. Others followed a trail chopped through the jungle to Sótano de la Cuesta and Sótano de la Estrella, three kilometers to the north. Sótano de la Cuesta is the main attraction of the area, a 570-foot drop into the top of a large room a thousand feet long and 300 feet wide with a ceiling over 500 feet high, one of the largest rooms in a North American cave. The shaft of sunlight entering the room makes a spectacular sight even in December when it does not reach the floor. A summer picture of a person in the beam of light shining 500 feet from floor to ceiling would sweep any photo salon. There is light enough that a flash is not needed—only a tripod. It is possible that there is another deep pit in the area, as Sótano de la Cuesta is not exactly where it was supposed to be . . . a “black hole” in the jungle was seen from the air on the ridge between the “star-shaped sink” and the west slope of the range, and while looking for this pit Sótano de la Cuesta was found about 300 feet south of this ridge. It is possible that they are the same pit but it seems unlikely that their apparent positions from the air would be so different. A letter has been sent to John Fish for him to search his air photos of the region for a black hole about 1000 feet south of Cuesta. If there is another pit, it might be even more spectacular than Cuesta, as we flew over the pit in July at noon on a bright, sunny day and could only see blackness from the air. Over a thousand man-hours were spent chopping trails into the “star-shaped sink” and it would be especially nice if another sink could be found with only a few hundred feet of chopping.

After photographing in Cuesta and Estrella, surveying between the entrances and clearing a shortcut trail, the cavers returned to the Los Sabinos campground, the center of caving in the Valles area. The next day we spent recovering and relaxing by visiting the local movie (6 pesos) and swimming in the nacimiento. For the next two days, we talked to the various groups stopping by the campground and tried to find guides to some local caves. We talked to a woodcutter we had met at Cueva de Los Monos two years ago about taking us to a “deep” pit he had told us about, but he had to go to a funeral. Returning to camp, we found Don Shofstall of convention fame and his group returning from caving in the Gómez Farías area. Bob Addis of Bob and Bob fame stopped by. Kyle Isenhard, Bill Bauman, John Wingert, Bill Combes, Gerald Hale and Peter Lord returned from doing the 1345-foot drop in El Sótano. A group mostly from Indiana consisting of Mike Van Note, Barb Ransom, Peter Syrusik, John Valainis, Joe Lieberz and Eduardo Castro went with Paul Courbon to Sótano de las Golondrinas. Paul then pronounced Golondrinas “the best shaft in the world,” thus making it official. (Provatina is too cold anyway.) Two Indiana cavers, Eric Valainis and Tim Davis, climbed to the Window on the wall of Golondrinas after traversing narrow guano-covered ledges only to find it ended in a steep guano slope to the ceiling. They wanted something else to do, so we sent them to Sótano de San Francisco off the highway to San Luis Potosí. A 330-foot drop into a deep pool was explored by John Fish several years ago but he did not swim to the shore, and when the pit was finally checked, it was found there was a short passage leading to another drop. Lieberz and Van Note descended this drop another 330 feet into a deep pool and the next drop was 120 feet into a deep pool. By that time the cold water (since the cave is high in the mountains) had taken its toll, so they returned to the surface. They didn’t have wet suits so they called Valles for reinforcements. Alas, the only group equipped for wet caving (Pete Strickland’s group) had already left for the mountains above Aquismón and a large group of cavers from the Rensselaer Grotto in New York did not feel they were equipped for cold water either. (They knew what cold water was all about.)

Finally, it was time to return to Austin. Steve arranged for a guide to take him to some new caves found by woodcutters east of Los Sabinos and the various other groups departed to visit areas of interest.

—Reprinted from UTG News, 6(4):10-12.

Date: 27-31 December 1973

Destination: Gruta del Palmito, Grutas de Villa de García, Huasteca Canyon, and Cueva de la Boca.

Persons: Paul Bonner, Joe Everton, David Foster, James Jasek, Mimi Laurens, Jane Laurens, Frances McCauley, Gary Parsons, Frank Sadek, Alicia Wisener

Reported by: Jane Laurens.

The Temple group left Temple at about noon and picked me up in Austin on their way down. We ate at an A&W somewhere along the way that night and continued on to the border. We had no trouble getting across and arrived at Bustamante about midnight and crashed. The next morning we met some South Dakota and Illinois cavers who had done Precipicio and another cave. They were planning on doing Palmito that day.

We started out early, and after discovering the right road to the cave we proceeded. Many hours were spent in the cave which put the group out after nightfall. Our group met up with the South Dakota and Illinois cavers and did Palmito with them. After everyone got down, we went to Ojo de Agua and cleaned our dirty bodies in the relatively warm water. We ate and then crashed.

The next morning, Jim, Mimi, and Joe met us at our camp; we ate and hit the road, traveling to Grutas de Villa de García, a commercial cave which is northwest of Monterrey. Getting up to the cave involves riding a cable car which goes up an extremely steep trail of 800 feet. The cave is in Cretaceous limestone and is fairly large with many interesting rooms and formations. We left at 4:30 p.m. and went through Monterrey and Villa de Santiago de Ciénega. We drove on up the mountain road to camp just off the road by Huasteca Canyon. We woke up with much frost on our bags and had to get up and brave the frigid weather. Fortunately it warmed up a lot when the sun came up. We walked into the canyon down to the waterfall. The South Dakota people then went further into the canyon with their super truck.

After much picture taking of the incredible scenery, we headed back to camp and took off again. Our next destination was Cueva de la Boca which is on the south side of Cañon Garrapatas, 1.4 miles east of Presa de la Boca. Even though we arrived after nightfall, we did the cave after eating a fantastic pitch-in dinner. The cave entrance is reached by climbing and crawling up a steep slope. The entrance is about 100 feet square and the cave is in Cupido limestone. This cave is really just one very large room with numerous mining pits for phosphates. La Boca has some but not many formations, and there are some very large bats which inhabit the cave.

We started the long drive back the next day. We stopped for a little sight-seeing and souvenir buying. After spending two hours trying to get out of Nuevo Laredo, we finally got to the border and across in about five minutes. We stopped in Laredo to eat and were "royally shafted" by a cafeteria there. Getting some gas in San Antonio, we arrived in Austin about 9:30 p.m. I was left there and the rest arrived in Temple about 11:30 p.m.

The gas in México was fairly cheap and not at all scarce. We hit one expensive station in our travels.

—Reprinted from UTG News, 6(4):9-10.

Date: 29 December 1973 - 5 January 1974

Destination: Aquismón area, San Luis Potosí

Persons: Don Broussard, David Hutchings, Cindy Kane, Dino Lowrey, Logan McNatt, Peter Sprouse, Pete Strickland, Steve Zeman

Reported by: Peter Sprouse

Sleeping near Aquismón Friday night (Dec. 28) after four days in the El Abra, our group rendezvoused with a group of seven persons from Austin, including Bob Rhoades and Victor

Benalcazar. In Aquismón we found burro prices extremely inflated because of the frequent trips up to Sótano de las Golondrinas. Not wishing to encourage this problem, we elected to carry our rope ourselves. Fortunately, we had relatively short lengths, as our first destination was a multiple drop cave north of Sótano de las Golondrinas, close to the town of San Rafael. We obtained permission and were on the trail by 11 a.m. We arrived at the campground below Golondrinas in time to watch the evening sparrow flight in.

Sunday morning most of us headed up to the cave; Logan was sick so he stayed in camp that day. Peter Strickland had previously explored down four drops within the cave, but had run out of rope and caving companions at the top of the fifth drop. So we entered the cave with many short lengths of rope. The locals who gathered around the entrance had no name for the cave. When we suggested Cueva de San Rafael it didn't seem to offend them, so that we named it.

The entrance is in a small sink of vertical rock walls on all but one side. It is about three feet high and four feet wide, and keeps these dimensions for 50 meters, down a dry stream bed with occasional pools. Then a five meter climb down followed by a two meter climb down. Immediately after this are two drops in succession: ten meters and 13 meters into a pool. This is followed by 35 meters of wet tube-like passage one meter high and 0.5 to 1.5 meters wide which opens into the top of a pit 40 meters deep. Passage off the base of this led to a two meter climb down and a seven meter drop. This brought the party to the limit of previous exploration. Only two people were in the group to arrive there first, Don Broussard and myself. While I prepared to descend the virgin pit, Don discovered a side pit off the same room but it did not appear deep or promising so was passed up. I reported the pit to be 14 or 15 meters deep and set off to determine whether more rope was required. Descending a steeply sloping passage, I came upon an estimated 30 meter-plus drop. So Don rappelled down the 14 meter drop with more rope and I then descended the next drop which turned out to be only 20 meters. Again I pushed on, to report back of a seven meter drop further on.

An order was then sent back for more rope and after a while Pete Strickland came down with three ropes. They rigged the next drop and Pete rappelled down and pushed on 100 meters to where the small stream he was following disappeared through a five-inch wide crack. . .dead end, bottom cave.

The party left the cave and Broussard, Strickland and myself returned to bottom cave and began the survey out. After four hours, Steve and Dino came in to help de-rig. We then found that the pit Don had peered into was of substantial depth after all. Steve rappelled in to report a depth of 45 meters and a low, short passage that got too tight for him to push. As the survey party was already past this point, it was not surveyed for lack of time. The whole crew was back in camp 15 minutes before midnight, New Year's, in a sullen rain.

A late start was made the next day for Paxalja, a small town south of La Laja near which Don Broussard had visited, but not descended, two sótanos. A third pit, seen from the air, was also in the area. The group of noncavers with Bob and Victor left with them for Aquismón when we reached Paxalja, and we filled up with water from a spring and continued on to the first pit, Hoya de Quile, where we camped.

The hoyá (pit) was of very large diameter, at least 100 meters, and had a parrot colony living in it. We rigged at the lowest point of the lip, so we had only a 50 meter rappel. The bottom was dense jungle, sloping funnel-like to a small, mainly vertical cave at the bottom. A large shelter cave was found in the opposite wall. The survey took the rest of the day.

The following day we hiked to the next pit, Hoya de Quital. We arrived an hour before dark in time to see an amazing number of parrots fly into the pit, possibly twice as many as that live in Golondrinas. Then to our surprise, clouds of swifts gathered overhead and dove into the sótano. This was apparently only the second known pit to have a swift colony, known

as swallows by the Mexicans. Not nearly as many were observed though, as at Golondrinas.

The next morning we prepared for the descent. Quital is a very impressive pit, almost as large as Quile and much deeper. A new length of Bluewater III rope was lowered in and Logan descended. It was a free rappel of 90 meters, very close to 300 feet. On the opposite wall was a gaping black crack which reached into the floor. Logan investigated this and found it to be a high chamber where the swifts roosted on or near the ceiling. It was 80 meters long and 25 meters wide in the middle with guano mounds as tall as three meters.

Don and I found another passage off the entrance pit which led to a very large room from which the sound of water could be heard. This required a rope to enter so we returned for rope and help. The others joined me in exploration while Don went off to climb the huge talus slope on the north side of the pit. The group sent a man down the sloping drop into the room, and the others followed. Shortly, Logan was amazed to find a large piece of Indian pottery close to the base of the drop. How could Indians have descended a 300-foot pit? Mystified, we began the survey. We collected some specimens of troglobitic shrimp and earthworms, and discovered several other potsherds.

Returning to the entrance pit we were further amazed to find that Don had ascended the talus slope, done a climb unbelayed to a skylight entrance! This solved the pottery mystery. Steve returned from further exploration in the swallow crack with a piece of a Matamoros newspaper dated early 1973. Apparently modern-day Mexicans had also visited the pit recently, possibly to kill swifts.

Logan, Pete and I began the survey around the bottom of the sótano. We closed a loop around the walls and the base of the talus slope. As dusk fell, I prusiked out and Logan and Peter climbed the talus slope out. On their way out they encountered a cave passage going off that had been reported by others earlier, about 35 meters below the lip. Many bats were exiting.

The next morning it was decided to split into three groups: one to continue surveying, one to explore the bat cave, and one to look for the third pit seen from the air. This pit has two openings which appear to go into the same pit. Don and Logan went off to hire a guide to look for it while Steve, Cindy and David explored the bat cave. Dino, Pete and I surveyed down the slope and then into the swallow hole.

Don and Logan returned after a few hours in which time a guide took them back to the same pit (Quital), then had to leave. No other guide could be found so they returned to the pit and descended into the pottery chamber to get drinking water. Pete Strickland accompanied them to photograph the pottery.

The bat cave team emerged and the survey team went up to survey it. They reported four drops, the last into a big room 30 by 70 meters. Pete, Steve and I surveyed in, and on the way out pushed a side lead which opened into big passage to a 25 meter drop into a room beyond. This was not descended or mapped.

Our food running out, the next day we headed back to civilization. By hiking back east over the mountain instead of north to La Laja, we made it down to the Inter-American Highway by early afternoon.

Date: 18-21 January 1974

Destination: Gruta del Palmito and Gruta del Carrizal, Nuevo León

Persons: Roy Brooks, Susan German, Jay Jorden, Preston Forsythe, Ron T. Kopel, Mary Conner, Neal Morris, Pete Strickland, John Steele, Rene Shields, Barbara Vinson, Willie Vinson

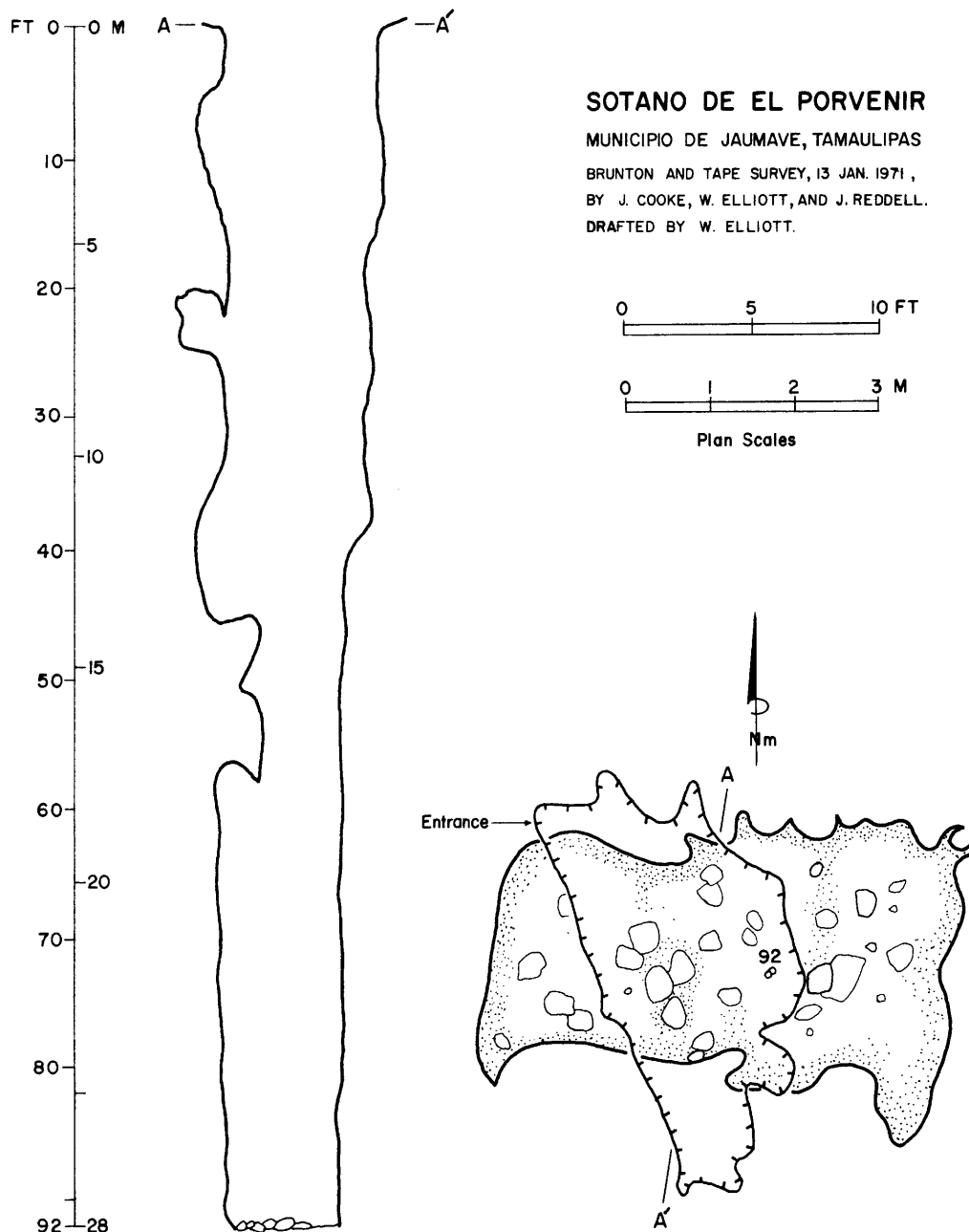
Reported by: Neal Morris

The above twelve people drove to Gruta del Palmito with some trouble crossing the border

because of one person's long hair. At the police station in Bustamante, the group ticket for the cave cost 5 pesos a person. The guide was at the entrance with the key and would turn on the lights for one hour... We took a leisurely tour of the cave, rigging the Birthday Passage and visiting the New Room... The next morning, a group of Laredo cavers drove up carrying the cave guide and his bicycle. They had been checking leads near Candela with some miners for guides. They also informed us that the building under construction in the parking lot was only a restaurant and not a sky ride to the cave as we had hoped...

Soon we were swimming in the sun-warmed pool outside the entrance of La Gruta del Carrizal. Some went in the cave; others did not. It was afternoon when we got back to the pavement from Carrizal...

—Summarized from UTG News, 6(4):13-15.



ARTICLES

ABORIGINALLY OCCUPIED CAVES IN THE SIERRA DE EL ABRA, SAN LUIS POTOSI AND TAMAULIPAS, MEXICO

by John W. Greer

The following list briefly describes caves in the El Abra range which were checked for archaeological materials in the summer of 1972. Detailed descriptions of the caves, their locations, and their archaeological components will be given in other reports and are also on file with the AMCS in Austin. In most cases, areas near or even adjacent to the caves were not checked for archaeological materials. All referenced sherds in these descriptions are aboriginal, that is, old, presumably pre-Hispanic and of native origin. Recent pottery in most cases was not present.

Cueva del Abra. A large impressive entrance 21 m wide and 18 m high is above the highway in the upper El Abra pass. The spacious cave runs back 183 m to a 26 m drop in a large dome pit leading to lower levels. Red aboriginal pictographs occur in a small alcove within the cave on the south side of the entrance. One aboriginal sherd was found at the base of the entrance slope.

Cueva Tanchipa. The entrance is a large, overhanging circular shelter, with a breakdown slope extending downward to the back of the shelter, from which point vertical drops requiring equipment begin. The entrance room is 45 x 90 m and 9-23 m high. Beside several small phosphate test pits near the back of the entrance room are human bones of at least seven individuals—14 femurs and many miscellaneous bones and skull fragments. Apparently the entire bodies were there, but cavers are uncertain whether the bones were dug from the test pits (presumably) or were originally on the surface in that portion of the cave. Cueva Tanchipa was entered in December 1971 by UT/AMCS cavers and was reported by Abrey Washington (pers. comm.).

Cueva de Los Sabinos. The 15 m wide x 30 m high entrance opens into a room 30 x 60 m. Numerous aboriginal sherds were observed by John Fish and Don Broussard in July 1972.

Cueva Pinta. A sheltered breakdown slope descends to two large rooms with flat dirt floors 22 x 44 m and 30 x 36 m. An additional small passage leads to a small pit. Sherds and other artifacts occur in all parts of the cave, including a small alcove in the entrance overhang, the breakdown slope, both rooms, and the back passageway. Limestone pebble and cobble accumulations occur along the walls in both rooms, and many are associated with pictographs. Pictographs include over 135 handprints—mainly negative red, black, or gray, and a few positive orange prints—and miscellaneous positive red figures—men, geometric designs, dragon-like figure, box figures, etc. Most black prints, including a child's deformed hand and deformed foot, occur alone in the left-hand room near a series of small flowstone dams—possibly an area chosen for its presumed curing powers.

Sótano de los Monos. A small room in the upper cave overlooks the large entrance of the main deep vertical shaft. A hole in the floor opens into a parallel shaft joining the main shaft

at the bottom of the drop. Petroglyphs cover nearly all the available rock surfaces. The main panel is covered with animal figures (coati-mundi?), stick men, a turtle, a bundle-burial figure (?), a female human fertility figure holding a lightning bolt (?), and miscellaneous figures. The panel above the secondary shaft opening consists primarily of bundle figures with a few geometric designs. Other panels contain mainly human stick figures (primarily male), footprints, and unidentifiable figures. No sherds were observed. The name is a local one referring to the *monos* (*dibujos*, drawings, figures) in the cave. Human male stick figures showing the usual pendulous penis previously have been presumably erroneously referred to as monkeys by various cavers misinterpreting the name of the cave as translating "monkeys."

Hoya de Higuerón. A large oval sink 45 m across and only 365 m from Cueva de los Monos opens down a steep breakdown slope through an entrance 9 x 9 m into a large room 153 m x 40 m. Sherds and other artifacts occur at the bottom of the entrance slope and on old soil surfaces and dry flowstone areas within the cave. Low stalactites are broken and possibly were aboriginally collected as a source of calcite temper for pottery.

Cueva de las Manos. A small oval passage 95 m long and 4.5 m wide is about 230 m south of Ventana Jabalf on the east face of the range. Two small side rooms near the back of the cave contain painted negative red handprints. Sherds are abundant at the entrance and into the passage-way.

Cueva Cerámica. A small passage 23 m long and 1.5 m wide is between Ventana Jabalf and Cueva de las Manos. Sherds are abundant throughout the cave.

Cueva de los Indios. Genaro Cruz, a local guide, reported on July 2, 1972, this cave toward the top of the east face south of Ventana Jabalf and just south of Ladera Blanca. A white scar on the hillside marks the location of the cave. Although the cave was not visited, it is presumed from its name that archeological materials at least at one time may have been present.

Cave. Genaro Cruz also reported a cave north of Ventana Jabalf which was entered by a friend from an adjacent ranch at the base of the east face. The cave is toward the top of the escarpment and contains whole ceramic jars, metates, mocajetes, etc. Genaro also described additional small caves south of Ventana Jabalf, many hard to get to and requiring vertical climbs on cliff faces.

Cueva del Nacimiento del Río Choy. The large room inside the lower river entrance contains sherds on the dirt floor, but none definitely of aboriginal origin. The upper cave, entered above the railroad bridge, contains two modern shrines in constant use for the curing of personal and family ailments and the general pursuit of well being. Cavers in 1970 observed the pit at the back of the upper cave being used during related activities. Aboriginal sherds were observed just inside the entrance of the upper cave.

Nacimiento del Río Mante. In the picnic area on the northeast side of the cave is an aboriginal occupation area containing numerous sherds and other artifacts. No other adjacent areas were checked.

Cave. A small cave containing numerous aboriginal sherds just north of the Valles-Tamuín pass was visited several years ago by Don Broussard (pers. comm.).

Cueva Grande. Sherds have been observed in the cave mouth by AMCS cavers.

No archeological materials were observed in the following caves:

Sótano de Japonés.

Sótano de Soyate.

Sótano del Arroyo.

Sótano de Yerbaniz. Sherds observed in a nearby arroyo are not thought to be related to the cave.

Cueva de Taninul n. 4. Phosphate mining activities have completely removed all the original

floor level and thereby any cultural material which likely was present.

Ventana Jabalí (presently known locally as **Mina San Luis**). The high oval entrance (12 m wide and 18 m high) on the east face overlooks the coastal plain toward Tamuín. The upper several meters of floor have been removed by phosphate mining activities, thereby destroying all possibility of finding cultural debris. Probably, however, the 365 m long cave was well used aboriginally, as is suggested by the use of such adjacent caves as Cueva de las Manos and Cueva de la Cerámica.

Presumably caves were used for several purposes. Honey probably was collected in nearly all areas as it has been recently in such caves as Cueva del Abra, Cueva Pinta, Cueva del Nacimiento del Río Choy, and Ventana Jabalí. Parrot feathers were available from such entrance areas as the nacimientos Choy and Río Mante. Caves serving as water sources have not yet been observed in the El Abra. Ground calcite temper in local pottery presumably was obtained from stalactites in such caves as Hoya de Higuerón and perhaps the upper cave at Monos. Caves undoubtedly were used at least in part ceremonially, as suggested by pictographs in Cueva Pinta, Cueva de las Manos, and Cueva del Abra, and the petroglyphs in the upper cave at Monos. Pits, such as the impressive vertical freefall shaft at Cueva de los Monos, may have been used for disposal localities for bundle burials, as is suggested by the Monos petroglyphs. Probably, however, bodies were simply buried in caves, such as the case at Cueva Tanchipa. The numerous sherds indicate caves also were used as habitation sites, either simply for temporary occupation, such as Cueva de la Cerámica and probably Cueva Tanchipa and Ventana Jabalí, or while the cave was being used ceremonially, such as Cueva Pinta and Cueva de las Manos. Cueva de los Monos does not appear to have been occupied additional to the presumed religious activities.

The efficiency of early people moving through the El Abra jungle is noteworthy. The abundance, variety, and complexity of the materials at Cueva Pinta, for example, suggest that at least some caves were visited repeatedly. Such may also be the case for such caves along the crest as Cueva de los Monos and Hoya de Higuerón. Repeated visits to such isolated, nearly inaccessible caves indicate continual travel through the jungle, necessitating not only an exceptional sense of direction and fortitude, but probably also at least partially developed trail systems, competent familiarity with the geography of the range, and a large and stable enough local population to necessitate such trails, shrines, etc. The thick jungle region along the crest of the range is dotted with both old abandoned, partially overgrown milpas as well as the few modern ones still in use. Presumably parts of the jungle region were occupied and farmed as they are today. Such a life, including just passing through the jungle, without a machete, however, seems practically impossible, although wooden clubs certainly could have been used to chop through such relatively small jungle plants as the abundant and exceedingly wicked *malamujer*—e.g., the Cueva Pinta area now is nearly a solid *malamujer* jungle. The degree of influence from the large Tamuín area site complexes and religious centers is uncertain but certainly must have existed.

BIOLOGICAL HAZARDS TO MEXICAN CAVE EXPLORATION

by James R. Reddell

Introduction

The physical dangers of cave exploration have been written about many times. Much attention has been paid to safety with respect to climbing equipment, negotiation of drops, etc. In addition to the dangers inherent to the exploration of any cave there are additional dangers from biological factors, some of which are unique to Mexican caves. These dangers have generally been exaggerated and I have found that few cavers really know much about the plant and animal life which may be injurious to them while exploring caves in México. This article is intended to briefly summarize those groups of plants and animals which may endanger cavers during the exploration of Mexican caves and to absolve a few other species from undeserved guilt.

Viruses, Bacteria, and Protozoa

Many harmful lower organisms may be encountered in caves, but none are known to be unique to caves. Care should always be taken in drinking cave water. Many caves are located near towns or near houses, and human contamination is common in surface streams entering caves. It is very possible, therefore, to contract infectious hepatitis, amoebic dysentery, or other diseases from the water of caves.

Fungi

Although several species of pathogenic fungi are known from caves only one, *Histoplasma capsulatum* Darling, is of great concern to Mexican cavers. This fungus is the causative agent of a more or less serious lung ailment known as histoplasmosis. This fungus is common in caves throughout the southern United States and Latin America. In México it has been called "la fiebre de minas abandonadas" (the fever of abandoned mines), because of its frequent association with caves mined for bat guano and phosphates.

Histoplasma capsulatum grows readily on the droppings of birds and bats and is known from soil throughout the southeastern United States and has been isolated from the tissues of bats. In its mild state the illness may be asymptomatic or may resemble a mild case of influenza. In a severe state high fever, chills, and severe coughing may result. Death may result but it is uncommon except in the case of Mexican guano miners.

Twenty-two caves are known from which the spores of *Histoplasma capsulatum* have been isolated. These are known from the states of Durango, Guerrero, Morelos, Nuevo León, Puebla, Querétaro, San Luis Potosí, Tamaulipas, Yucatán, and Campeche. In addition to the actual presence of spores epidemics of histoplasmosis have resulted from visits to the following caves: Cueva de Cuetzala and Grutas de Cacahuamilpa, Guerrero; "caves at Xilitla" and Cueva Chica, San Luis Potosí; Cueva del Diablo, Nuevo León; Cueva de los Troncones, Tamaulipas; and Cueva del Guano, Durango.

Several members of the AMCS became ill following a visit to Cueva del Diablo, Nuevo León. This is the only verified instance of cavers becoming ill following cave exploration in México. However, at least two biologists exploring caves in San Luis Potosí and Tamaulipas have recently contracted histoplasmosis.

It is interesting to note that despite thousands of man-hours devoted to the exploration and

surveying of caves in México there is only one verified case of histoplasmosis among cavers. Since many cavers are from rural areas or have spent much time exploring caves in Texas and the other southern states they have probably contracted minor cases of histoplasmosis before beginning their cave explorations in México. This will leave them with an immunity to the disease. I have visited many of the most notorious caves in México and have spent hours mapping and collecting without illness.

Many cavers are very concerned about the report of death by Mexican guano miners in caves. It must be remembered that a guano miner will spend many days inhaling thousands of spores stirred up with the guano. The guano will itself greatly irritate the lungs and bronchial passages. This leads to massive infestations of the fungus. This will be very difficult for the body to contend with and, combined with poor or very late medical attention, can lead to death. Even the most extensive exploration and survey of a cave will not compare with a few hours of mining guano.

Higher Plants

Caution should be taken in the entrance area of pits to avoid contact with *Chidoscolus multi-lobus* (Pax), the infamous *mala mujer*. This plant, which may reach heights of 5 m or more causes severe skin irritation and may result in considerable swelling of areas in which the fine spines become imbedded. Several cavers have been incapacitated for a day or more by contact with this plant. *Mala mujer* is a plant commonly associated with disturbed areas. Following the clearing of an area it is one of the most vigorous new plants to enter. It is, therefore, especially abundant about the edges of cornfields, along roads and trails, and at the edges of other clearings. Since many sótanos are the only area uncleared in a field *mala mujer* may practically surround them. Some people have exhibited more or less severe allergic reactions to contact and this can be potentially dangerous.

In addition to *mala mujer* other stinging nettles, including one known as *mal hombre*, may be found in the vicinity of cave entrances. Besides the nettles many species of cactus, agave, and thorny plants abound on the walls of vertical pits.

Leeches

Leeches have been reported from several cenotes in Yucatán and one species from a cave in Veracruz. They are probably not uncommon in caves in southern México which are fed by surface streams. They have never been reported attached to humans and so present little if any problem to cave explorers.

Scorpions

Few scorpions are known from caves in México. The highly poisonous species of the family Buthidae are abundant in southern México but are rare in caves. The blind species of the genus *Typhlochactas* are very rare and very small and present no danger. The genus *Vejovis* is not infrequently found in caves, but their venom is not nearly so potent as that of the buthids. In México only a few specimens are ever seen in any cave and these usually under rocks.

Whip Scorpions and Amblypygids

Although greatly feared and considered by local inhabitants to be venomous these awe-

inspiring arachnids are completely harmless. The whip scorpion, *Mastigoproctus giganteus*, is occasionally seen in cave entrances. The “whipless whip scorpions” of the genus *Tarantula* abound in Mexican caves and may be found from the entrance into the most remote parts of the caves. They are large enough to inflict a painful bite but lack poison glands.

Spiders

Only two groups of spiders in Mexican caves may represent any danger to man. The most obvious of these are the large spiders of the genus *Ctenus*. These are frequently found on cave walls both near the entrance and in the dark zone. Some species of the genus are quite poisonous, but nothing is known of the degree of venomosity of the species inhabiting Mexican caves. One caver has been bitten by the species most commonly found in the caves of the Sierra de El Abra and Sierra de Guatemala, *Ctenus mitchelli* Gertsch, with no ill effects. Nevertheless care should be taken in catching these animals.

The other group of spiders which may conceivably be dangerous are those belong to the genus *Loxosceles*. Again, however, nothing is known of the effects of the cave species on man. The brown recluse, *Loxosceles reclusa*, is not known from Mexican caves, but the species which do inhabit caves belong to the same species group and so may be dangerous. No caver, so far as I know, has been bitten by one of these spiders.

The black widow spider, *Latrodectus mactans*, occurs in México, but has not been found in caves. Since it occurs in Texas caves it will probably prove to be a rare inhabitant of the entrance zone of caves.

Ticks and Mites

The relapsing fever tick, *Ornithodoros turicata*, occurs in México, but has not been taken in Mexican caves. It occurs in Texas caves and several cases of relapsing fever have resulted from its bite while in caves. It is a parasite of goats and wild mammals and its presence in dry shelter caves in northern México is to be expected, but it is certainly cause of little concern.

Other species of the genus *Ornithodoros* are known from bat caves, but are not known to be vectors of disease.

Chiggers are exceptionally abundant in bat caves in many parts of México and may readily infest man. Despite possible discomfort attendant on their bites, none have been reported to carry disease.

Centipedes

The only centipedes likely to be of any concern to cavers are those belonging to the order Scolopendromorpha. At least one species up to one-third meter in length is not uncommon in caves of the Valles area. These could cause very painful bites, but the bite of the centipede is not nearly so dangerous as popular belief would have.

Millipedes

Millipedes are frequently confused with centipedes and so thought to be dangerous. Millipedes may be easily distinguished from centipedes by the presence of two pair of legs on each segment of the body in the milliped as opposed to only one pair on the centipede. Large millipedes of the genus *Orthoporus* are frequently abundant on bat guano in caves

throughout México and are frequently pointed out to be poisonous. They are completely harmless, as are all millipedes.

Fleas

Bat caves are infested with fleas, but these rarely bother man. The fleas of the genus *Pulex* are the common pests of man but have not been taken in Mexican caves. The plague flea, *Xenopsylla cheopis* (Rothschild), was reported in 1936 from a cave in Yucatán. This is certainly an accidental occurrence and presents no danger to cavers.

Bees and Wasps

Bees and wasps probably present the greatest danger of any insect to cavers in southern México. Although many bees frequently seen in the entrances to caves are stingless, other species are capable of inflicting severe stings. Cavers emerging from the vertical entrances of Grutas de Juxtlahuaca, Guerrero, and Sótano del Rancho de la Barranca, San Luis Potosí, have received very severe stings from large species of wasps whose nests were situated below the lip of the overhang at the top of the pits. The caves of Yucatán are inhabited by several species of bee and wasp and during a recent trip to Yucatán at least four separate species on many occasions inflicted painful stings on myself and other cavers with me. Some caves were unenterable because of nests immediately inside small vertical entrances. Since nests tend to be built immediately beneath overhangs where they cannot be seen but can be easily kicked as one rappels it is possible to stir up the entire nest with the result that a caver could be stung so many times as to be incapacitated. Anyone highly allergic to the sting of bees and wasps should take great care in entering caves in southern México and particularly in Yucatán. A caver can count on being stung if he enters many caves there.

Ants

Although ants present no actual physical danger to cave exploration they may be quite annoying. An exploration of Sótano de Guadalupe in San Luis Potosí was made almost impossible by the presence of a huge nest of army ants at the entrance. The entire cave was filled with thousands of individuals. These readily attack and, although their bite is only annoying, the presence of hundreds crawling on and biting you at the same time is rather disconcerting. In Yucatán several species inhabit the entrance areas of caves and these may inflict bites ranging from mildly annoying to as painful as the sting of a wasp.

Snakes

Rattlesnakes are only rarely encountered in caves in México. The large *Crotalus terrificus* has been seen in a single cave in Yucatán. Extensive exploration of northern México will certainly result in records of the Western Diamondback (*Crotalus atrox*) and other species there. The caves of Texas are frequently utilized by rattlesnakes for shelter.

The fer-de-lance (also called the cuatronarices and the palanka), *Bothrops atrox*, has been found in several caves in the Sierra de El Abra, San Luis Potosí. Individual snakes, up to one or two meters in length, have been found up to one-kilometer from the entrance of Sótano del Arroyo on more than one occasion. The snakes are usually very sluggish and are likely to be dangerous, unless actually stepped on, only in entrance areas. A huge

active individual, however, was seen in a crawlway side passage in Cueva de Ungurria, Veracruz. It struck at a caver but fortunately missed. This species is also reported by local inhabitants to frequent caves in Yucatán, but a recent visit to about 70 caves there failed to find this species.

A species of copperhead of the genus *Agkistrodon*, called Huolpoch in Mayan, is reported to inhabit caves in Yucatán but none have been seen. Mayan children who guided us to the caves assured us that the Huolpoch "ate Christians like us."

Bats

As a result of vast publicity about rabies bats have become the most feared animal inhabiting caves. Bats are generally beneficial to man through the destruction of insects. They are the greatest source of energy input into caves and the presence or absence of bats will largely dictate the type and variety of animals present in the cave.

The Mexican freetail bat, *Tadarida brasiliensis mexicana*, is known to harbor rabies. Denny G. Constantine conducted experiments in Frio Bat Cave, Texas, which demonstrated that the rabies virus may be present in the air of large bat caves when the freetail colony is present. He placed several species of animal in the caves and they contracted rabies through the air. This discovery led to near-panic among many cavers and many have now taken the series of vaccinations as a preventive measure against rabies. Unfortunately much nonsense has been written in caving publications about the danger and it is greatly over-emphasized. It is perhaps wise here to say a few words about the actual danger from rabies. Two human deaths not definitely attributable to bites from bats have occurred following visits to Frio Bat Cave, Texas. One was a public health worker engaged in capturing and banding bats, the other a mining engineer interested in guano deposits. Neither was aware of bites from bats during their work. Both, however, either handled or were hit by flying bats during their visits to bat caves. It is not impossible that a bat could have bitten them. It is also possible that the virus could have entered an open sore following bites by the bats on gloves or clothing.

Animals left in Frio Bat Cave were caged in the cave for long periods of time. Long exposure to the ammonia-laden atmosphere of the cave may have made the mucous membranes more susceptible to invasion by the rabies virus. I personally find it significant that thousands of man-hours of cave exploration have not resulted in a single instance of rabies among cavers. Furthermore many bat researchers have spent long hours in bat caves without infection.

The greatest danger to cavers lies in the possible bite by a bat, possibly without being aware of it. The danger from airborne viruses is apparently present only under conditions such as occur in Frio Bat Cave. That is saturated atmosphere, enormous bat population, lack of circulation, and high temperature. These conditions are seldom duplicated and when they are thoroughly discourage long periods of exploration.

The principal species of bat implicated in the transmission of rabies is the vampire bat, *Desmodus rotundus murinus*. It is believed that the Mexican freetail bat becomes infected as a result of contact with the vampire bat during the period when the migratory freetail lives in Mexican caves with the vampire. At the present time there is an intensive campaign in México to eradicate vampires. This has not resulted in any appreciable reduction of the species to date and they are encountered in caves throughout central and southern México.

Anyone exploring caves in México should be particularly careful to avoid handling bats, especially vampire bats. When possible avoid direct contact with them. Never pick up a bat which is lying on the floor, since it may be ill. It is unavoidable that cavers can fail to be struck by flying bats in crawlways but it is wise to avoid this as much as possible. When

bitten by a bat, regardless of the species, one should if possible capture the animal to determine if it is rabid. Any large Mexican city will have a public health service large enough to test the animal for rabies. If it is not possible to capture the bat the series of preventive shots is necessary.

Cavers doing extensive exploration in caves in México should probably obtain the series of duck embryo vaccinations. They are safe and comparatively painless. Furthermore they give an added feeling of security in visiting bat caves.

Conclusion

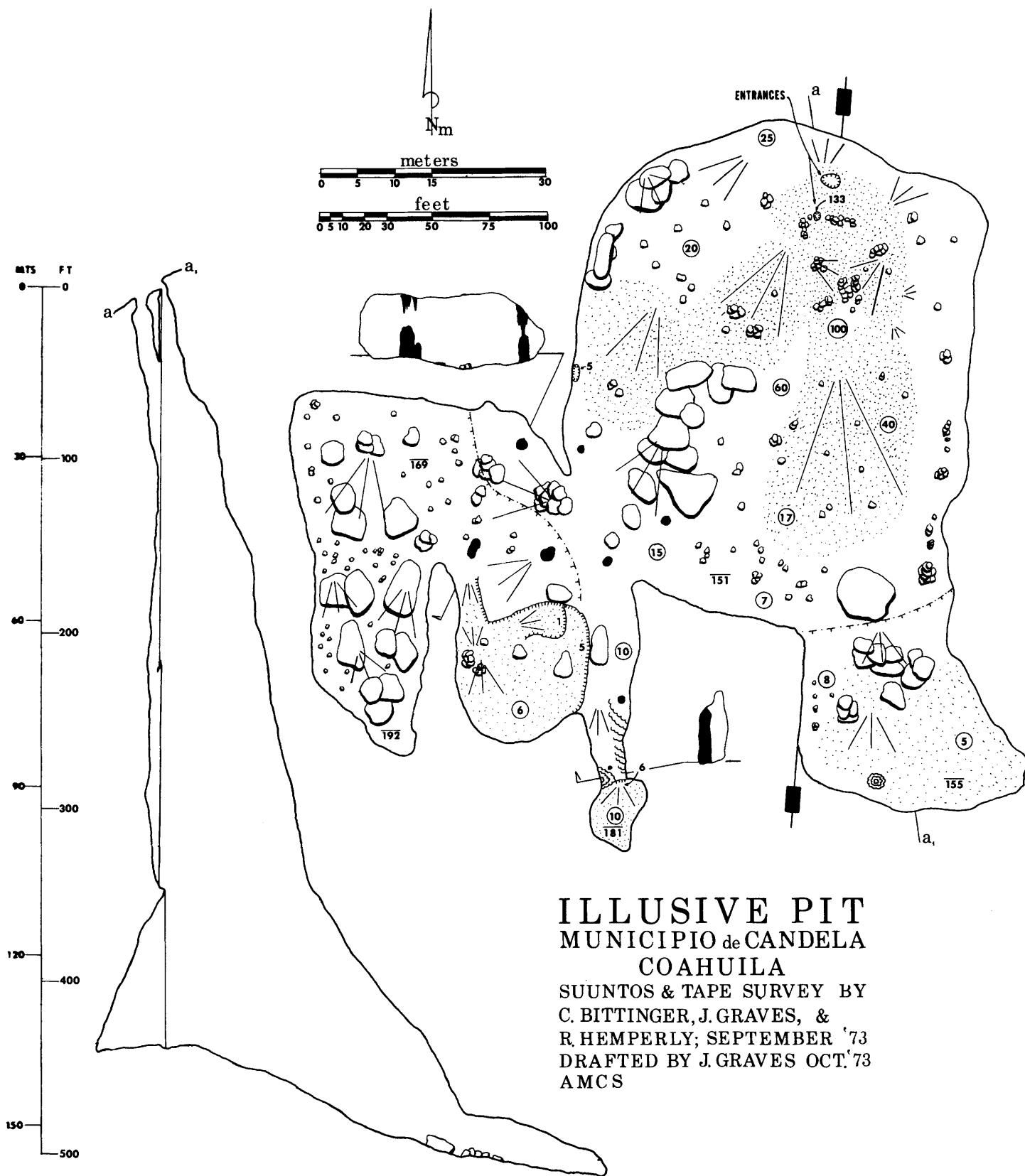
I have attempted to list the more important groups of animals which may be dangerous to cavers. None of these dangers can compare to the actual physical dangers of cave exploration and yet most cavers worry more about the animal and plant life than they do about their equipment or their physical ability to explore the cave. This is unfortunate, since the greatest biological hazard to cave exploration anywhere is the caver himself. One should always be on the guard against his carelessness in tying ropes, in his care for his equipment, in knocking off rocks over his companions, and in being too tired or too inexperienced to swim through a siphon or make a rock climb. All of the dangers from other species combined cannot compare with that presented by *Homo sapiens* himself.

THE ILLUSIVE PIT

by Craig Bittinger

Ed. note: The map accompanying this article was originally published in the December 1973 *Texas Caver*. The cave was originally discovered by the Laredo Grotto in 1972, but we do not yet have details on who first explored it.

The Illusive Pit is located due west of the town of Candela, Coahuila, México. To reach the pit one must drive across the desert, through spots containing up to 15 cm of powdered dust. Following roads that progressively get worse until suddenly it is difficult to determine what is cowpath and what is road, one gradually approaches the mountain. From the base of the mountain one continues without the benefit of a road, crashing through yucca, bushes, arroyos, and rocks until the slope becomes impossible to negotiate by vehicle. A forty-five minute walk up an arroyo brings the pit into view. The two entrances are only 5 m apart. One is 1 m in diameter and the other is 2.5 m. At one time the pit was mined for guano, so the tie-off is an old metal spike imbedded in the limestone. Over the lip and 133 m above the floor one realizes that the rappel is off one side of a natural bridge. The shaft of light pierces the darkness and the rope follows a wall to the floor below. The drop is free and finally the pit bells out and one lands in a huge chamber. Following the breakdown into the depths, surrounded by huge formations, the chamber's size gradually impresses the mind. The entrance is only a tiny dot far above. Resting during the climb out, one sees outlined a strange figure of a man with his arms crossed on his chest and eyes closed, bearing mute testimony to a miner's long fall. The Illusive Pit is aptly named, a guide is the only way. (See map, page 135.)



CUEVA DE JUAN AMARO

by Fred Paschal and Tom Wright

Juan Amaro Cave is located approximately 5 km NW of the western mouth of Bustamante Canyon, or on the range north of Bustamante Canyon. The cave entrance is located approximately 13 m from the top of a ridge and about two-thirds of the way to the crest.

The entrance is a pit about 3 m wide and 7 m deep. At the bottom of this entrance drop a room extends to the north for a short distance to a short dead-end dome pit. To the south the entrance room runs into a semi-chimneyable drop (drop A) for about 4 m.

At the bottom of drop A is a north-south trending room that runs down to drop B at an angle of about 25 degrees. This room has a few small dry formations at the north end and two large dry stalagmites at the southern end overlooking drop B.

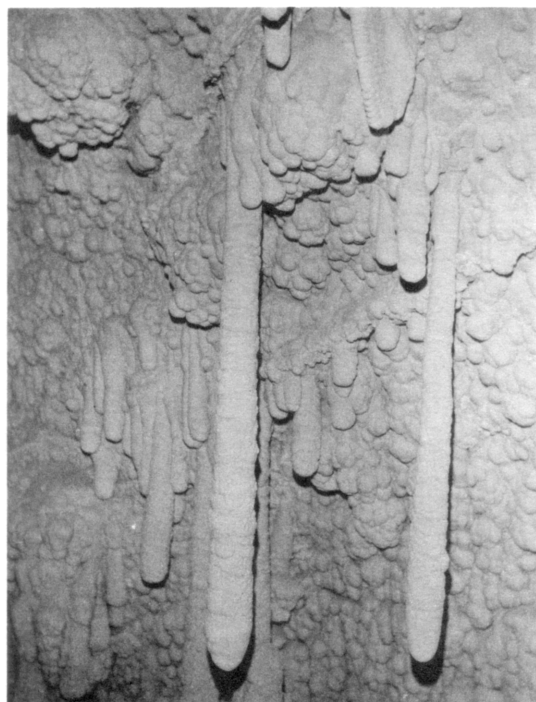
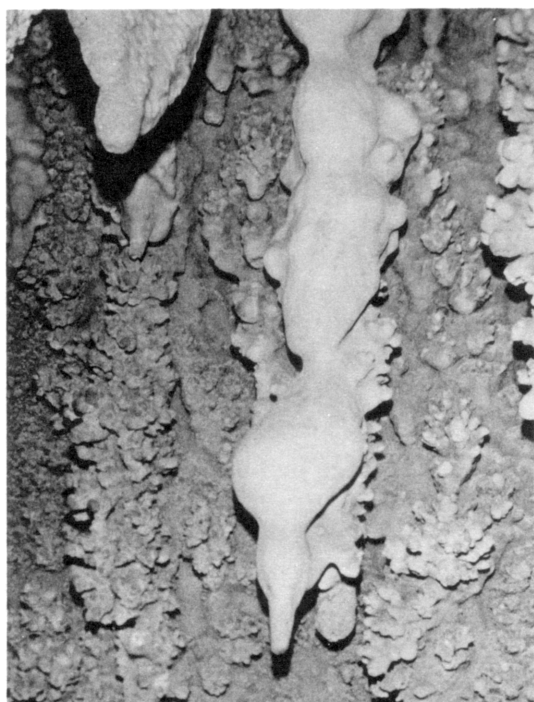
Drop B is over a narrow flowstone wall for about 4 m. From the bottom of drop B the Discussion Room runs toward the northwest to a dead-end. The Discussion Room is probably the most completely decorated room in the entire cave. A large portion of the walls of this room resemble cauliflower. Where these walls lean to form the ceiling there are phallic-looking stalactites about 1 m long and shorter. The majority of these formations appear at or below 2 m above the floor. Directly below drop B at the entrance to this room there are helictites and bacon-rind formations on a multicolored wall. All of the formations observed in this room, as well as in the rest of the cave, were dry. (See photographs, page 137.)

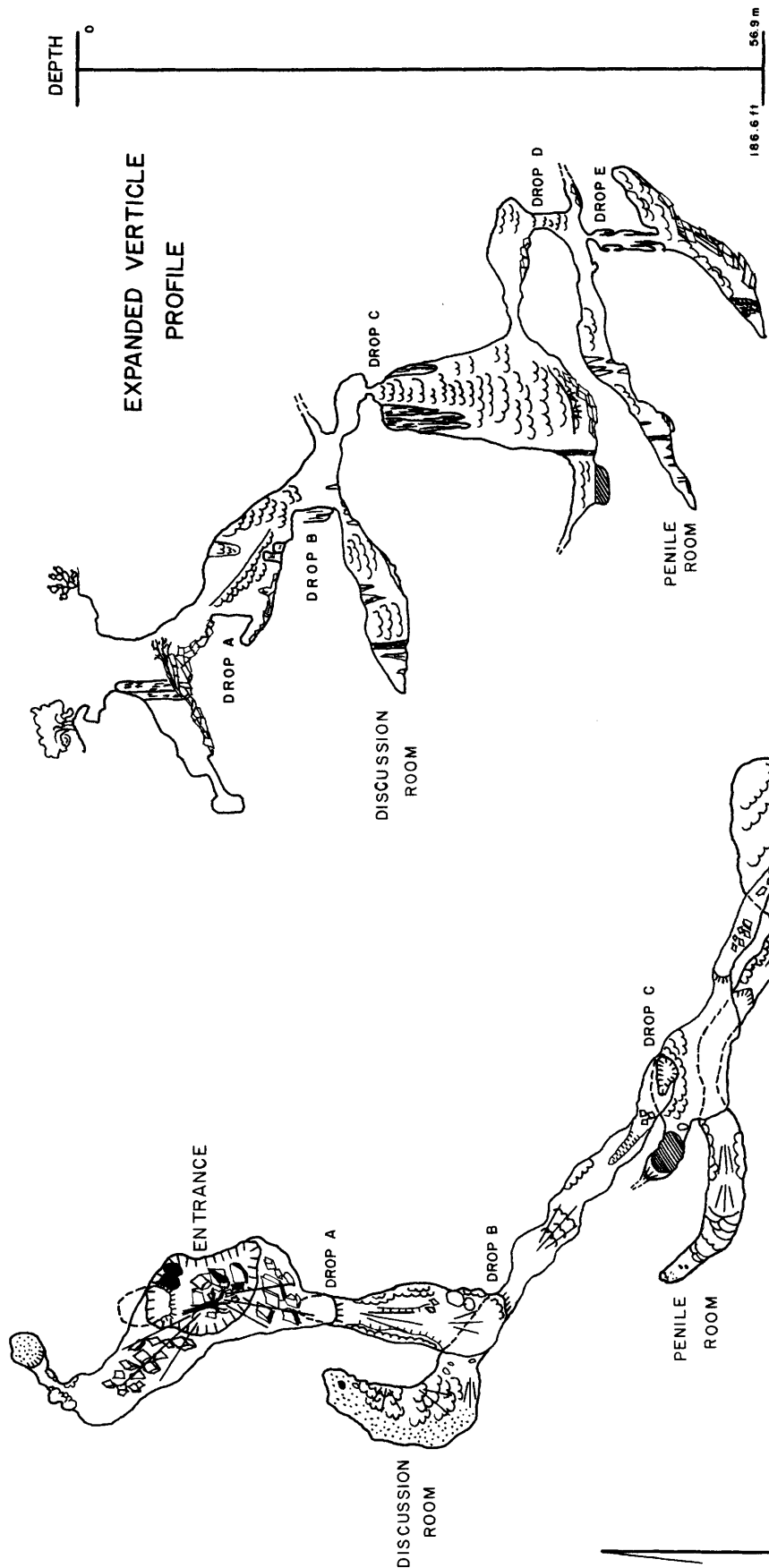
From drop B the cave trends toward the southeast to drop C, a drop of approximately 19 m which is against a dry, crystallized flowstone wall. At the bottom of drop C going to the northwest there is a room with some old formations and a pool of still water. Toward the southeast the cave continues on to drop D (4-5 m) which is really just a short climb down to a level that is fairly well decorated and just below the previously described level in which the water is present.

Drop E is located within sight of drop D and is a small hole in the floor, at the level in the cave at which drop D ends. This chimneyable drop of about 9 m bottoms out in the lowest known room of the cave, the floor of which slants at about 30 degrees and is covered with loose breakdown. At the bottom of this room are two small leads that were not pushed because the mapping teams' bodies wouldn't fit.

To say it briefly, Juan Amaro Cave is a fine example of a small to moderately sized cave that is dead and aging; still retaining much natural beauty; located in or on the border of the Municipio de Bustamante, Nuevo León, México. (See map, page 138.)

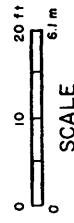
Photographs of Cueva de Juan Amaro on following page:
Top. At entrance to Discussion Room.
Lower Left. Inside Discussion Room.
Lower Right. Phallic Formations in Discussion Room.
Photos by Fred Paschal.





CUEVA de JUAN AMARO NUEVO LEON, MEXICO

SUNTO and TAPE SURVEY NOV 1973
by M. MILLER, D. PASCHAL, F. PASCHAL,
H. SMITH, T. WRIGHT
DRAFTED by T. WRIGHT



CUEVA DE LOS SECUNDARIOS

by Craig Bittinger

Cueva de los Secundarios is located a few miles outside of Ocampo, Tamaulipas. It's entrance is near the edge of a lava flow approximately 7 km from the old volcanic cone of La Sierra Partida. The lava flow is approximately 3 m thick at the cave's mouth and is underlain by a limestone hill. According to Russell Harter, California lava tube expert, the cave was formed when the outside portion of the lava solidified leaving the cave walls and the inside portion flowed on leaving a void behind it. The major entrance was caused by the collapse of the ceiling of a large room and the minor entrance, by the cave intersecting the side of the hill. Russell suggests that exploration should be done uphill from the major entrance, along the projected direction of the cave passage, in order to find more cave.

The cave was first entered by Amador Cantú and his friends on a reconnaissance trip in the area. The cave was filled with grade-school children at the time of their arrival and thus the cave was named. Amador explored the cave until he encountered a large concentration of vampire bats which forced him to abandon the effort until a later day. During the Christmas of 1972 Amador once again returned with the hopes of mapping the cave. The team proceeded to make a map of the cave in spite of the vampires and to their surprise discovered a river of guano originating under a small dome and continuing until it sumped into a small hole in the wall.

To our knowledge Cueva de los Secundarios is the first lava tube mapped in México but shouldn't be the last as several huge, nearby, tubes have been partially explored and await our return. (Ed. note: Since the above was written Cueva de la Sierra Partida was mapped and the map printed in AMCS Newsletter, IV, 3, p. 103.)

CUEVA DE LOS SECUNDARIOS **Supplementary Description**

by Amador Cantú

Since Craig Bittinger has adequately described the geographic location of Cueva de los Secundarios, this article will serve to describe the physical characteristics of the cave itself.

The cave is entered through a lava sink approximately 1 m in depth and 5 m in diameter. The sink has large lava breakdown in it, covered with vegetation. From the sink two entrances lead to passages trending eastward.

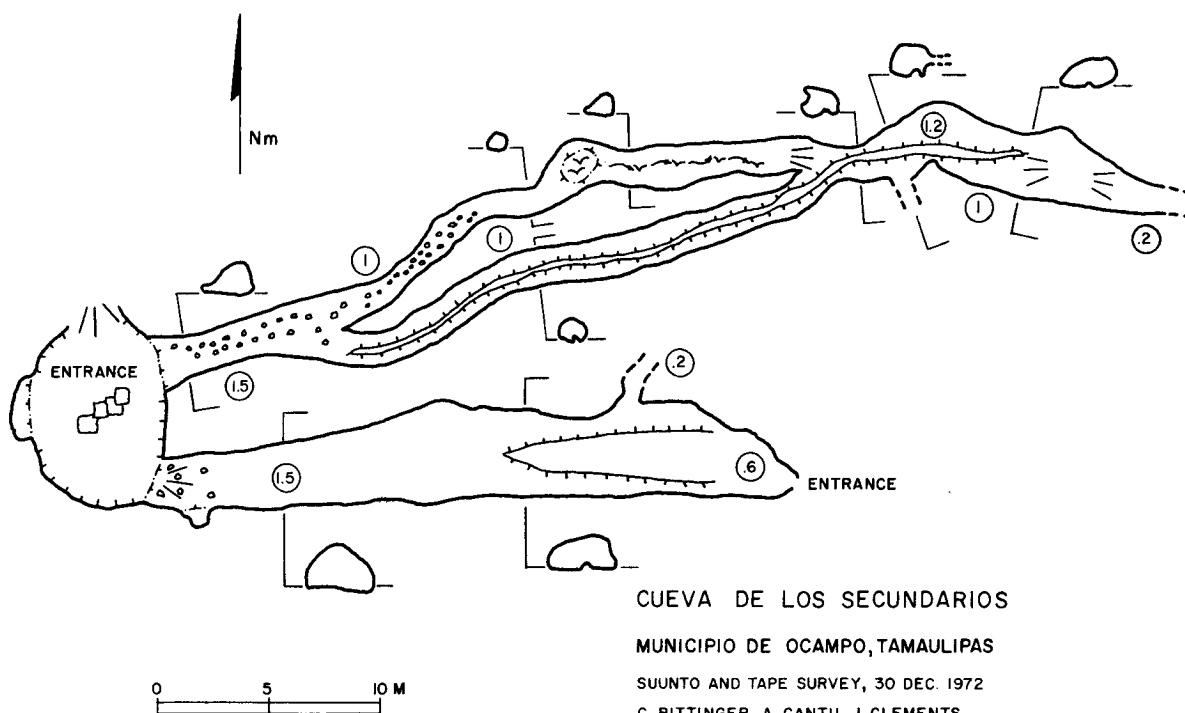
The northern of these two almost parallel passages is about 1-2 m wide and 1.5 m high, with small lava breakdown and fairly smooth walls. This continues until the passage splits into two smaller passages. These two passages later connect about 30 m to the east. The southern of these varies in height from about 1 m at its western end, to about 30 cm at its eastern end, where the two passages reconnect. The smaller passage has a small lava ridge that runs its entire length approximately in the center of the floor. In the larger passage the unmistakable odor of bat guano can be detected. There is lava breakdown for about 6 m. The height slowly decreases from 1.5 m to approximately 1 m. At the point where the breakdown ends the passage curves noticeably, leading to a fetid pool of vampire bat guano about 0.5 m in diameter. Directly over the guano pool there is a dome about 2 m high where the bats roost. This section of the cave is almost covered by the bat excrement.

From the pool a small trickle of fluid runs eastward. At this point the walls and

floor become more jagged and irregular. This trend continues until the junction of the two passages, 10 m east of the guano pool.

At this point the features of the two passages combine with the walls and floor, continuing to be irregular and rough and the lava ridge from the smaller passage continuing for about 8 m. The passage widens to about 3 m and then narrows to about 1 m. The ceiling at this point rises to approximately 2 m. Directly past this point to the right is a small passage, about 40 cm in height, which quickly pinches off. This entire passage is made up of black lava with the exception of the last 10 m, where there is a distinct red color.

The southern passage leading from the entrance pit is about 1.5 m high rising to 2.5 m. It widens from 3 m to 5 m and there is some breakdown at the entrance, but very little further on. The floor has a slight but noticeable ridge down the middle which becomes more distinct toward the end. The walls and floor are grayish in color. At the eastern end of this southern passage there is a small entrance about 30 cm in diameter. About 7 m from this eastern entrance, going back west toward the main entrance pit, there is a small lead on the northern side of the passage. The lead pinches off after about 1 m. (See map, below.)



ANOTHER HISTOPLASMOSIS CAVE

by Mike McEachern

Cueva de Juan Flores, Department of the Peten, Guatemala, is located about 300 m downstream and on the opposite bank of the river from Yachilan, Chiapas, México. The cave is 60 m inland and 20 m above the Usumacinta River.

The 10 by 2.5 m entrance leads to an 840 m long stream cave which goes through a small mountain or ridge. The predominately dry cave has a short wet section near the east entrance. There is a 3 m long pool which must be waded and may siphon during the wet season. The cave contains both phreatic and vadose features and both phreatic and vadose solution is presently going on.

About 300 m into the cave is the roost of a moderate sized bat colony. The floor in this area is covered with a thin layer of guano about 2 to 5 cm thick.

The cave is known and visited by Mexicans living in Yachilan. The cave was visited and mapped by Mark Debois, Ron Ralph, and Mike McEachern during March 1972. The cave was revisited about a year later by Mark Debois and about a half a dozen other people. Three of the members of the second party later came down with histoplasmosis. All of the victims were non-cavers. There is little in the cave to attract cavers and it should wisely be left to the bats. (See map, page 142.)

MOLLUSKS FOUND IN CAVES NEAR TLAMAYA, SAN LUIS POTOSI

by Ron Bridgemon

The mollusks found by Ron Bridgemon while exploring Sótano de la Porra, Municipio de Xilitla, San Luis Potosí, (see map, page 143.) in December 1966 are terrestrial gastropods of species still living in the open in the vicinity. The specimens became fossilized after crawling in or being washed into the cave. They are not true cave snails and do not live normally in caves. They are strictly Mexican snails and none of the species occurs north of the Mexican border. Not enough is known at present about the mollusks of México to state how extended their distribution might be there.

The mollusks belong to the following families, genera, and species. Identifications were made by Dr. Joseph C. Bequaert (University of Arizona).

Family Helicidae: *Helicina turbinata* Pfeiffer; and *Ceres nelsoni* Fischer and Crosse.

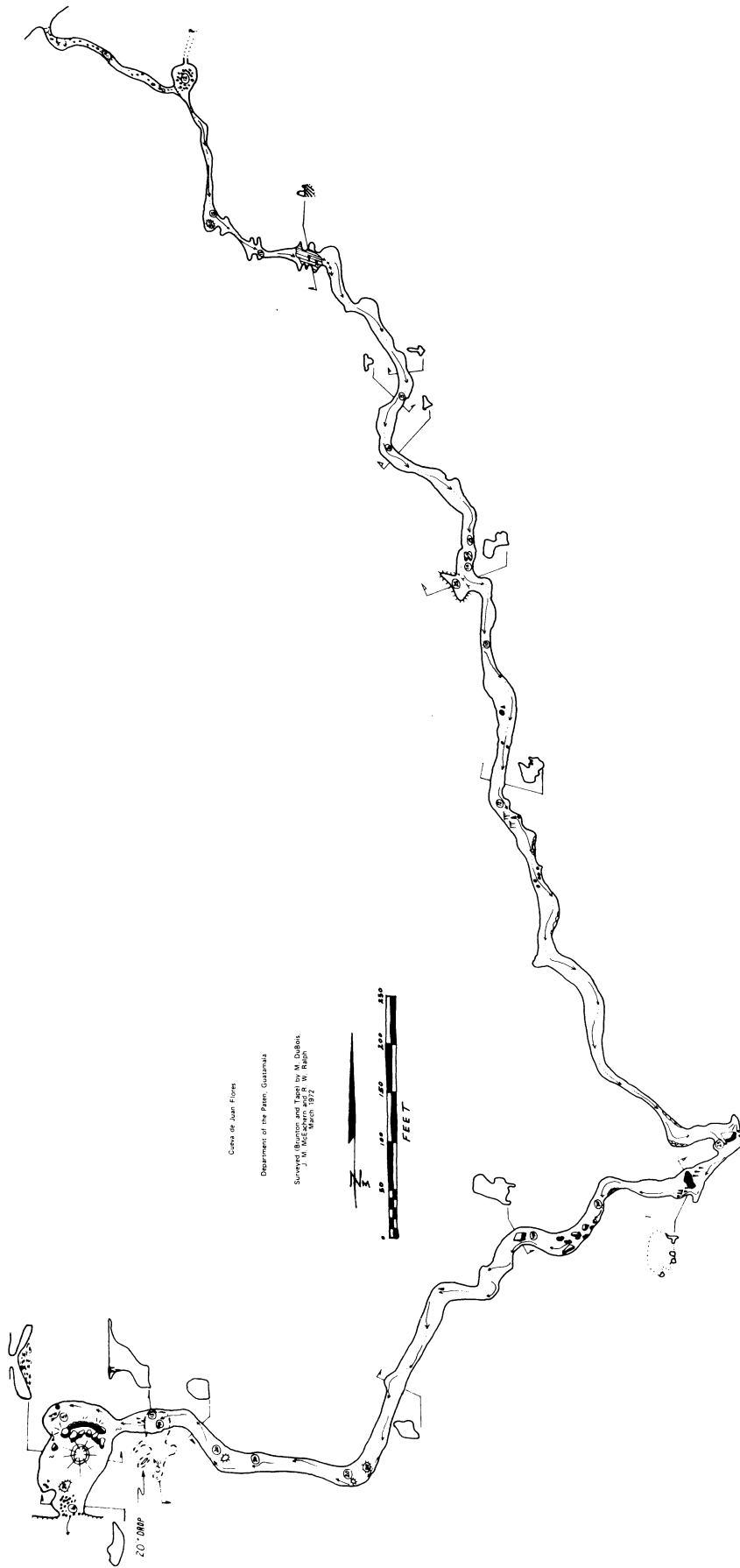
Family Cyclophoridae: *Cyrtotoma mexicanum* (Menke).

Family Spiraxidae (or Oleacinidae): One species of *Euglandina*; and 2 species of *Streptostyla*.

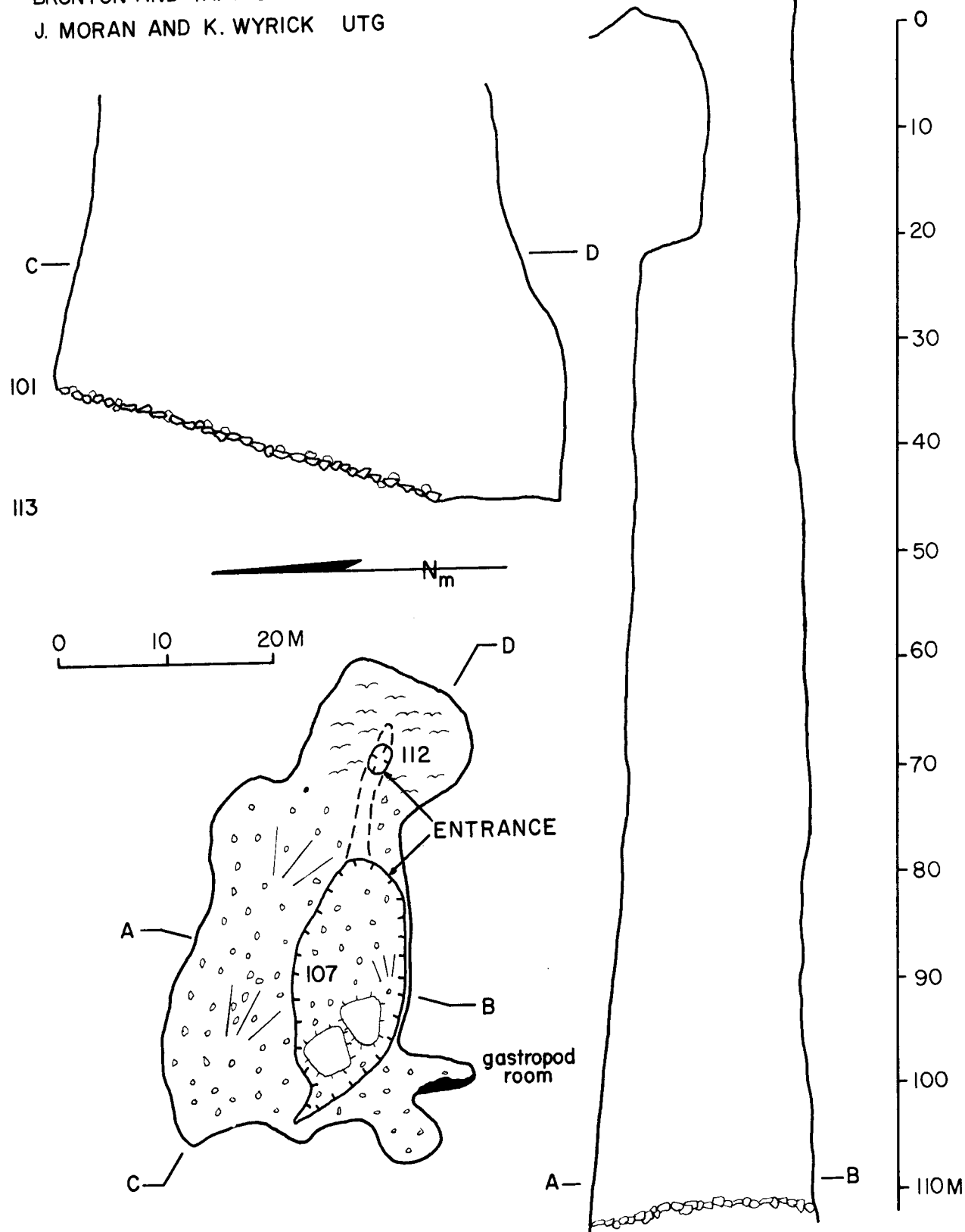
Specific names of these 3 kinds cannot be provided at present by the University of Arizona.

Family Urocoptidae: *Eucalodium speciosum* (Dunker).

Similar specimens were found in Cueva del Arco by Ron Bridgemon in December 1968.



SOTANO DE LA PORRA
MUNICIPIO DE XILITLA, S.L.P.
BRUNTON AND TAPE SURVEY BY
J. MORAN AND K. WYRICK UTG



NOTES ON CAVES IN CHIAPAS, MEXICO, AND GUATEMALA

by Rod Syme, with notes by Stewart B. Peck

Mr. Rod Syme was one of several Canadian cavers that investigated several caves in Chiapas and Guatemala December 1973-January 1974. Since Rod had done some cave biology field work for me in the Canadian Northwest Territories, I asked him if he would keep his eyes open for fauna, make collections, and make notes on what he found. The full report of the explorations will probably appear in *The Canadian Caver*. Rod's notes are given here, and I have given a list of tentative and general identifications of the fauna collected in each cave, following its discussion.

Stewart B. Peck

Rancho Nuevo, 6-7 mi E of San Cristobal de las Casas, Chiapas, México

This is a cave well known to locals as well as some tourists (Canadian cavers mapped it before this trip)—it is pretty well completely a walk-in cave—very wide and high. There are a very few points where one must use one's hands—mostly for tiny climbs (5-8 ft). Because this cave is well known, easy to explore and full of the most beautiful formations I've ever seen, it has been overrun by "flashlight cavers" who've left their garbage a remarkably long way into the cave.

The cave has a mud (solid) floor alternating with solid rock, broken chunks of rock and a few small pools of static water in which nothing could be found except footprints and garbage. The walls of the main passage are solid, clean rock—unbelievable formations just crowd the walls and floor. Because of the size of the passage, the cave is not very humid and my impression of it, biologically speaking, can be perhaps summed up in the word "barren."

More specifically (biologically) the five of us who did the cave, *combined*, saw only four spiders, only one of which I was able to collect. There was nothing to be found in the few pools of water nor in or around organic garbage. The spider I collected was found about 20 ft above the average floor height on the wall beside a small climb. No sign of vertebrate life (or evidence thereof) was noted anywhere. Though I was somewhat dazzled by the stupendous formations and our trip was a quick one (no surveying) I feel there wasn't too much that I missed and that generally the cave offers little of biological interest. Because of the formations, however, this is one cave that shouldn't be missed.

Fauna collected: The one "spider" is the largest depigmented and eyeless cave harvestman that I know of. And it may well represent the highest known elevation for such beasts in Chiapas.

El Choreadero, Chiapas, México

Rod misplaced his notes on this cave, but he made good collections. Fauna collected included 10 "Platynus" carabids, 2 Tachys carabids, 1 staphylinid beetle, 2 white spiders, 1 eyeless and depigmented harvestman, 1 earwig, 1 phorid fly, 1 trombiculid mite, 1 Subulina snail, 3 small millipeds of 2 species, 3 large snails, 1 eyed crab, and 4 crickets.

Cueva Cerro Hueco, Tuxtla Gutiérrez, Chiapas, México

We were forewarned by locals that we would not survive if we entered this cave due to lack of O₂. Apparently if this didn't kill us, the vampire bats would! We went as far as we could (to a sump) in this unexplored cave (3000-3500 ft) and all of our party survived. The cave is a resurgence,

the first three or four hundred feet of which is wide, dry and about 4 feet high. Beyond that is water—neck deep and swimming all the way up a single passage with no side passages above water level. The passage is from five to 10 feet wide, the ceiling disappears like a rift—thinning out to solid rock at about 15-30 feet above the water level. The walls are covered with 1/8-1/2 inches of solid mud with a slimy surface. Generally speaking, there is little variation in the passage for the entire wet part. Of biological interest were the bats, especially near the entrance, almost as thick as Nahanni mosquitos, zooming all around us. There were many different types. I suppose they were more or less responsible for much of the “scum” on the water surface throughout most of the cave. “Invertebrately” speaking, the small area of the walls which could be seen and reached (small since we were neck deep in water) had nothing living on them and the only collection made was of four small white crayfish which we found in a shallow pool above a small waterfall (3 ft). There were 8 to 10 such waterfalls we found. The water is very warm and pleasant to swim through. Perhaps a visit in a drier year would reveal more of biological interest.

Fauna collected: 4 eyed crayfish (3 males, 1 female).

Plateau north of Huehuetenango, Guatemala

This area (around km. stone 130, elevation 10,800 ft) was a new one to all—exploration of this impressive yet rather young karst area was the purpose of the visit here—Gurney (?), an American, has published a little about this area. In our three days of walking in this area we found many pits—all going 10 to 30 feet then squeezing out, silt choking or otherwise stopping. All the longer caves (300-500 feet surveyed, 12,000 ft) sumped (all were quite wet).

One cave which became known as “125 ft pit” was explored and surveyed by four of us. Briefly it entailed a drop of about 70 feet in the first 90 feet of passage. The entrance is perhaps 5 feet square and is at the end of a dried-up stream bed. After the first 90 feet is a 103 foot pit in somewhat of a rift. The walls of this are jagged and irregular which made “ladder-descending” awkward. Beyond this is a small crawl to a narrow walkable passage which is still dropping rapidly. In the section above the pit were many large flies of which a vial was collected. In the section beyond the bottom of the pit there were a few areas of trickling water with a few small pools (6 inches to 2 feet across). In these I collected a “water-walker” of sorts (I believe) and a few other things. The end of the passage was a narrow squeeze blocked by flowstone. There was little mud in this cave. The passage was reasonably humid and wet only where mentioned above.

We did two more caves, both of which Gurney had noted and named with one Spanish name (which I’ve forgotten) followed by 1 and 2. I did No. 1 (a wet cold cave) with the two other Quebeckers and did the wet section of No. 2 with the two Quebecois plus John Mort. Another party did the dry section of No. 2 which went further than the wet sections of both 1 and 2 which sumped after 300-500 feet. No. 1 was very wet and we were climbing down ladders in cold waterfalls. After the first three waterfalls (25 ft, 10 ft, and 8 ft) was a squeeze (for me, anyhow!) and a 30 foot pit in a waterfall which we laddered. At the base of this was quite a bit of passage on the one level (all passages closed except for one which sumped). In this area was a sandy wet floor with many pools of water in which I found some beetles, a spider or three and many black planaria-like worms in the water; also amphipods. The worms disintegrated in the vials within a short time, perhaps due to agitation climbing out of the cave. The worms seemed to cling to surfaces like leeches and curled up completely when being collected. They moved with a stretching, contracting action. In No. 2 were green frogs with black spots clinging to vertical walls with the pads on their toes—they were about 3 inches long and resembled common Canadian frogs except for the toe pads. No. 2 sumped

very quickly after a 30 foot pitch and again, a vial of the numerous black worms “went to pieces” on me.

We drove 10 miles back along the road to where two more prospects had been found. I went to a double-entranced one which turned out to be a 10 foot through trip. Another group explored another which went 2000 feet to a sump. Mike Shawcross was quite excited about getting a quick glimpse of what he thought was a white, eyeless frog. He says he can’t be sure. It was unfortunate that I chose the wrong prospect.

Fauna collected in 125 ft pit and caves 1 and 2: 1 gerrid water strider, 7 calliphorid carrion flies, 1 Leiobunum harvestman, 1 carabid beetle larva, 5 corixid bugs, 6 dytiscid beetles, 17 eyed amphipods. This is generally an uninteresting assemblage of aquatic or streamside creatures which were most likely washed into the caves.

Cueva Seamay, Senahau, Alta Verapaz, Guatemala

This cave is the type locality of a remarkable eyeless carabid beetle. The cave was visited by about half of our party—I stayed in the non-historic passage from which the other beetle had come by myself while the others did the other passage. The passage is for the most part high and wide with a few squeezes and climbs connecting large long rooms. The cave is basically horizontal with walls of clean rock and a floor of broken rock and hard mud. I collected quite a few jumping spiders and a tailless pseudoscorpion (?) near the entrance plus assorted spiders and, alas, one beetle. In some of the pools, which varied from 2 to 10 feet across, were crabs and snails. I collected some snails and caught one crab, about 1 inch wide. I only had one jar big enough for the crab and in it was something fragile. I thought it best to kill the crab first and put him briefly in a carbide flame—my “briefly” was not the same as *his* for he fell to pieces almost immediately! The cave is mapped so there is no need to describe it further—it did have quite a bit of ‘life’ in it and it and other caves in the area merit further exploration.

Fauna collected: 1 “Colpodes” carabid, 7 crickets, 1 eyed harvestman. Unfortunately no more of the eyeless carabids were found. The claw of a large crab was found, and it may be of the same large species I found there, for which the crab specialist Dr. Al Smalley, says that no crab he knew of had such a claw. The conclusion is that there is a big and unknown crab yet to be found in the cave.

RECENT PUBLICATIONS ON MEXICAN SPELEOLOGY

Abstracts

Bittinger, C., J. Graves, and R. Hemperly. 1973. Illusive Pit Map. Texas Caver, 18(12):358, insert. The map of Illusive Pit, Municipio de Candela, Coahuila, is printed with a covering note but no story. This 192 m deep pit is one of the more significant recent discoveries in northern México. (JRR)

Fennah, R.G. 1973. Three new cavernicolous species of Fulgoroidea (Homoptera) from Mexico and Western Australia. Proc. Biol. Soc. Washington, 86:439-446.

This paper includes the description of two troglobitic fulgoroid homopterans (planthoppers) from caves in México. *Cixius orcus* n.sp., a member of the family Cixiidae, is described from Cueva de Emilia, Querétaro. *Oeclelius hades* n.sp., a member of the family Kinnariidae, is described from Cueva de Valdosa, San Luis Potosí. This represents one of the more exciting finds in Mexican cave biology since previously the only troglobites in this order were known from Hawaiian lava tubes and from caves in Madagascar. (JRR)

Hendrichs, Jorge, and C. Bolívar y Pieltain. 1973. Un nuevo esfodrino ciego del Sótano de San Agustín, Oaxaca, México (Colept., Carab.). Ciencia, México, 28(1):37-41.

Mexisphodrus urquijoi n.sp., a troglobitic beetle of the family Carabidae, is described from Sótano de San Agustín, near Huautla, Oaxaca. The cavernicolous species of *Mexisphodrus* and Mexican *Rhadine* are reviewed. A list of other fauna collected in Sótano de San Agustín is also included. (JRR)

Massoud, Z., and Magdalena Gruia. 1973. Collembolles Arthropléones de Cuba récoltés en 1969 par la mission cubano-roumaine, pp. 327-343. In: *Resultats des expéditions biospéologiques cubano-roumaines à Cuba*, 1.

This paper includes records and descriptions of the new species of collembolans collected in Cuba, some of which had previously been reported from caves in Yucatán. *Xenylla yucatanensis* Mills and *Proisotoma centralis* Denis, both previously identified from Yucatán caves, are reported from Cuban caves. The troglobitic species, *Sulcuncus falciferus* Mills, known only from Actún Sazich, Yucatán, is removed to the genus *Metasinella*, and is compared to the Cuban species of this genus. Another Yucatán troglobite, *Troglopedetes maya* (Mills), is compared with the other two species of the genus. (JRR)

Mitchell, R.W., and Masaharu Kawakatsu. 1973. Freshwater cavernicole planarians from México: New troglobitic and troglophilic *Dugesia* from caves of the Sierra de Guatemala. Annal. Spéléol., 27(4):639-681.

The first troglobitic planarians from México and from the genus *Dugesia* are described. The troglobites, *Dugesia typhlomexicana* and *D. barbarae*, are described from La Cueva de la Mina and La Cueva de la Capilla respectively, while the troglophile, *D. guatemalensis*, is described from La Cueva de las Perlas. Also described are non-sexual specimens of an additional troglophile population inhabiting La Cueva de la Capilla and of an epigeal population inhabiting a lowland stream near Gómez Farfás, Tamaulipas. Maps and descriptions of La Cueva de la Mina, La Cueva de la Capilla, and La Cueva de las Perlas are included. The affinities of these planarians are discussed, and several suggestions are made regarding their cave colonization and evolutionary history. (JRR)

Russell, Wayne. 1973. On the Precipice. *Texas Caver*, 18(12):363-366.

The discovery and early exploration of La Gruta del Precipicio, is outlined. Brief descriptions are given of La Gruta del Precipicio, Ojo del Gato, and Cueva del Vientos. The latter caves are accessible only by rope from the entrance of La Gruta del Precipicio. The recent pollution of the cave by trash left by CAVERS is noted and lamented. (JRR)

Editor's Note: The following abstracts are all of articles published in the newly-founded publication, *Spelaion*. This is the publication of La Comisión Nacional de Espeleología, Grupo de Investigación Espeleológica, México. Two issues have been published to date and are very well-printed, quite attractive, and contain a great deal of information for the beginning caver and on the activities of La Comisión in Mexican caves. The president of the organization is Alejandrina Pérez Casar. The address is: La Comisión Nacional de Espeleología, Texcoco 237-7, Col. Claveria, México 16, D. F., México.

Spelaion, 1(1). May 1973.

"Actividades: De Campo," no author, pp. 18-19.

1. Reconnaissance between Madroño de Amoles and Jalpan, Querétaro, with exploration of three small caves in the mountains crossed by the Los Velázquez road, and location of other caves to be reported in future articles. 2. Reconnaissance between Xilitla and the junction with the Valles-Tamazunchale road, S.L.P. Continued reconnaissance in the Huichihuayán area where eight caves have been found and partially explored. 3. Completion of a surveying course in Gruta de Pedro El Negro, D.F., with a total of 400 m mapped. 4. Photography in Cueva del Diablo, Gro. 5. Ladder and boat practice. 6. Visit to Gruta del Suanche, near Piedras Negras, Gro. 7. Visits to Gruta de Juxtlahuaca, Gro., with equipped cave-diving by Eduardo Castro. 8. Visit to Gruta de Pacheco and Gruta de Cacahuamilpa, Gro. 9. Reconnaissance between Tzin-zun-zan and Uruapan, Michoacán. Caves are believed to exist in the Sierra de Uruapan. 10. Reconnaissance of the Zitácuaro area with exploration of Gruta de la Calera, a histoplasmosis cave. 11. Reconnaissance of the Los Azufres, Mich., area. 12. Visit to a cave in the Cañon del Zopilote. 13. Visit to Gruta del Mogote, Gro., as a training trip. (WRE)

Spelaion, 1(2). July 1973.

"Una excursión a Cacahuamilpa (1874)," by Antonio García Cubas, pp. 6-17.

This is an extract from the author's book, *El libro de mis recuerdos* (1904). It is a rambling, flowery account of his visit to Cacahuamilpa, with many geological comments. He relates his visit to the Dos Bocas, and there are endless descriptions of the formations in Cacahuamilpa which are charmingly far-fetched. The author says that the cave was ignored until 1833 because the local Indians were frightened of the first stalagmite, which took the shape of an evil goat guarding the entrance. The first expedition by the townspeople of Tetecala was prompted by the wild stories of a criminal neighbor of theirs who took refuge in the cave from the law. (WRE)

"La Espeleología esa desconocida..." by Alejandrina Pérez Casar, pp. 18-22.

This article is taken from a talk given before the XIII Seminario de Excursionismo del I.P.N. The author discusses some of the factors which have held back organized speleology in México: ignorance and fear of caves, ignorance of speleology, cave-related diseases, lack of money, and the sport-caver syndrome. She criticizes the repeated trips some "excursionistas" take through the Chontacoatlán and the San Jerónimo (the Dos Bocas). Some people have visited them 200 or 300 times and seem to have little desire to visit other caves. (WRE)

“Importancia y significado del trabajo geológico de las aguas freáticas,” by Carlos G. Suarez C., pp. 24-26.

This is an elementary discussion of speleogenesis. The author gives the basic chemistry involved. Two illustrations show the various phases of the process. A short bibliography is included. (WRE)

“Histoplasmosis,” by Eustebio Enrique Mendoza Carrera (G.E.M.), pp. 27-30.

This is a review of the fungus, *Histoplasma capsulatum*, the causative agent of the disease histoplasmosis. The author discusses the classification, etiology, epidemiology, pathology, clinical characteristics, diagnosis, and treatment of the disease. It is thought that the American strains (usually associated with bird guano) are less virulent than the Mexican ones (associated with bat guano). It is suggested that a mask with a liquid filter could be useful in preventing inhalation of spores (gauze masks would probably be ineffective). Such a mask was described and figured in *Spelaion*, 1(1). A bibliography is included. (WRE)

“Nociones de Topografía Subterránea,” by Ruben Rocha, pp. 32-41.

Surveying techniques and equipment are discussed. The Brunton compass is recommended as the best instrument for cave surveying. Various techniques are described and illustrated, such as: surveying the center of the passage, surveying from wall to wall into the cave, surveying from wall to wall into the cave and out again, “spraying” a room, and various triangulation methods. Trigonometric formulae are given and survey book examples illustrated. A method for measuring heights with balloons is presented: hydrogen is evolved from hydrochloric acid, water, and zinc in a plastic bottle capped with a balloon. The potential dangers of hydrogen balloons and carbide lamps are not mentioned. A page of map symbols is shown, several of which are very different from standard American symbols. (WRE)

“Vocabulario Espeleológico,” by Alejandrina Pérez Casar, pp. 43-53.

The author lists 87 Spanish speleological terms, most of them geological, hydrological, and mineralogical. Many of the terms are quite technical and would be of use mainly to karst hydrologists. (WRE)

“Catálogo de Grutas,” no author, pp. 54-58.

This is a list of 106 caves and their localities extracted from *Los Murciélagos de México*, by Bernardo Villa R. (1966). Many of these have not yet been investigated by speleologists. Twenty-four states are included. (WRE)

“Actividades: De Campo,” no author, p. 60.

1. There were two visits to Gruta de Juxtlahuaca, Gro., with exploration of the non-tourist section. 2. Rock-climbing practice at Los Perros and El Cerro del Chiquihuite. 3. Reconnaissance of the area between Teloloapan and Cuetzala del Progreso, Gro., with exploration of Gruta de Cuetzala. 4. Ladder climbing practice at “Tres Peñas.” 5. Reconnaissance of the Teloloapan, Gro., area, with the descent of Sumidero de Teloloapan and exploration of Cueva del Tecolote. 6. Trip to Gruta de Peña Blanca, Méx., 7. Trip to Gruta de la Estrella, Méx.

“Espeleonoticias,” by Max B. Rios, pp. 61-63.

1. The Escuela Nacional de Montaña, Sección I.P.N. completed a technical course in mountaineering, including a section on speleology, in April 1973. Hugo Zacahula and Enrique Hernández A. were instructors. Enrique Hernández A. was designated as coordinator for a

future speleology course. 2. Robert Brian and Ellen Erlund of San Marcos, Texas, visited with Grupo de Investigación Espeleológica (G.I.E.) members in May 1973 and a slide show on Mexican caves resulted. 3. Dr. Federico Bonet has acted as a consultant on the commercial tourist development of Grutas de la Estrella, Tonatico, Méx. It will soon be completely developed and there will be a museum at the entrance. 4. Luis Velázquez Ramírez is writing his professional thesis at I.P.N. on the Resumidero del Río San Jerónimo, for his degree in geology. 5. Roberto Curiel, G.E.M. was temporarily blinded by exploding carbide in the Fuente Monumental of the Resumidero del Río San Jerónimo. 6. The Grupo Andino de Chile, Sección México, is planning a descent of Sótano de las Golondrinas, possibly with G.E.M. 7. The Escuela Nacional de Montaña, Sección Nuevo León, has asked for instructors from the Comisión Nacional de Espeleología to give a course in speleology. They are very interested in caves and report that there are many in Nuevo León.

ASSOCIATION FOR
Mexican Cave Studies

NEWSLETTER

Volume IV Number 5-6

April 1974

ARTICLES

A Preliminary Report on the Zacapoxtla-Cuetzalan Area,
Northern Puebla, México
Supplement



The Association for Mexican Cave Studies
is a non-profit organization
whose goals are the
collection and dissemination
of information concerning
Mexican caves

The AMCS publishes a Newsletter
Bulletin and Cave Report Series
which are available

to any sincerely interested
conservation-minded person

The AMCS Newsletter
is published six issues per volume
as frequently as necessary
at a cost of \$5 US per volume.

Information concerning
the other publications

is available upon request

Potential contributors are urged
to submit articles for publication

The article may cover any phase
of Mexican speleology

Trip reports are requested
from all trips

All correspondence
and orders for publications
should be sent to

Association for Mexican Cave Studies
P O Box 7037

Austin, Texas 78712 USA

Material for publication

in the Newsletter

should be sent to

James Reddell or William Elliott

Association for Mexican Cave Studies

Dept. of Biology, Texas Tech University

Lubbock, Texas 79409 USA

Publications Editor Terry W. Raines

Newsletter Editors William R. Elliott

James R. Reddell

Cave Files William H. Russell

Secretary-Treasurer Jan E. Lewis

Coordinating Biologist James R. Reddell

Graphics Consultant Chuck Bryan



THE SPELEO PRESS

Austin

=====

ASSOCIATION FOR

Mexican Cave Studies

=====

NEWSLETTER

Volume IV Number 5-6

April 1974

ARTICLES

A Preliminary Report on the Zacapoaxtla-Cuetzalan Area,
Northern Puebla, México
Supplement





A PRELIMINARY REPORT ON THE ZACAPOAXTLA–CUETZALAN AREA, NORTHERN PUEBLA, MEXICO

by Nevin W. Davis

INTRODUCTION

This report is the result of trips made into the Zacapoaxtla-Cuetzalan region in northern Puebla during February and March of 1972 and 1973. My caving in this area started when Jorge Ibarra, a friend and Mexican caver, suggested that my wife and I visit the area in which some of his wife's relatives live. He had spent some time vacationing in the area and knew of caves there, but he himself had never visited any. Upon arriving in Zacapoaxtla a round of introductions to family, friends, and co-workers of Alfredo Bonilla began. Later we were taken to the "show cave" of the area, Grutas de Jonotla.

On the way to the cave (over 19 miles of curvy road) Alfredo kept saying that this was the nicest cave in the region. Questions about other caves and sinks near the road were answered by small, etc. After leaving the truck in the relative safety of the village square in Jonotla, we walked to the cave. The cave was small and rather disappointing although it did contain some nice speleothems. On the way back to Zacapoaxtla I stopped to look at several sinks and found Cuevacita Ekimita. These small caves, the abundance of limestone and sinks, and the absence of surface streams except in the deep canyon to the northwest convinced me that there were larger caves in the area.

The next day the Bonilla's arranged for two helpers at their garage to accompany Judy and me on a hike from Huahuaxtla to Zapotitlán to see Grutas Karmidas and then to Xochitlán to see Xiliapa Cave over 2 miles northeast of the town. Facundo and Maurio proved to be able guides. We parked the truck in the safety of the school in Huahuaxtla and started the long, grueling hike to Zapotitlán, arriving after dark. The next morning arrangements were made to visit Grutas Karmidas. We took a number of photographs in this pretty little cave and after paying the guide, we continued to Nanacatlán. In town we asked if there were any caves near here; someone disappeared and soon returned with an old man who showed us Lracauch Cave. The old man had evidently explored this cave and wanted to accompany us through the pools in it. We had to give up exploration for want of a rope.

Nightfall saw us camping near a bridge over the Río Tecuantepec downriver from Nanacatlán. The next morning after the hike to Xochitlán we had breakfast in a restaurant and sought local people to guide us to the nearby cave. We were not shown Xiliapa; instead Hermino Ramírez López and Mario Hernández Rosales, school teachers in Xochitlán, showed us Xochitl (flower) Cave. Our hike back to Nauzontla, Cumbre de Apulco, and finally, Huahuaxtla at night in cold rain and fog will never be forgotten. It seemed like a never-ending walk along slippery trails and roads to the highway. We hitched a ride with one of Facundo's friends to the turn-off to Huahuaxtla and arrived at Zacapoaxtla near midnight.

In February and March 1972 Judy and I returned two more times to this area, once with Salvador Higareda, a Mexico City caver, each time finding and exploring more caves. Many of them were explored on solo trips and so were not pushed to the end. These were left to do on

Frontispiece. Mist from waterfall about 500 ft from the entrance of Grutas de Cuexalocstoc. (Nevin Davis)

the 1973 trips. All but 5 of the caves described herein were located in 1972 and all but 7 were partially explored.

In February and March 1973 I recruited Rick Rigg, Nanna Bolling, and Del Myers to accompany my wife and me. We were able to find more caves and map many of them.

Ed. Note: In Dec. 1973 a few additional caves were explored in this area by a group of Texas cavers. Recent road construction allowed changes in two of the road logs. These and a few other changes in the text are indicated by the initials, JRR. New caves are described in the Supplement.

AREA DESCRIPTION

Local relief is very high especially near the river canyons. Along the canyon of the Río Zempuala (Tecuatepec) there is a stepped series of cliffs higher than 300 ft. Elevations range from nearly 8000 ft near Zacapoaxtla to 800 ft in the Tecuatepec Canyon below Tuzamapan.

Although there are now roads suitable for automobile traffic to some of the larger towns, the major travel is by foot. There are trails to any point of interest but they may be difficult to find. Travel away from the trails is apt to be impossible. There are stone roads and even bridges in remote regions suitable for foot or burro traffic only.

From the Mesa Central near Zaragoza to about 6000 ft the hills are covered with pine forests. Below this are areas of birch-like trees with coffee trees planted among them. Any large trees in the lower elevations are sure to contain orchids. Below 4200 ft citrus and banana trees are grown. Field crops are grown over the entire region and cattle graze in pastures which look much like those in West Virginia with short cropped grass and precipitous hillsides.

Frost can be expected in the pine forest during the winter months. In late winter great clouds of half fog, half rain blanket the area for days, drenching everything. At these times it is best to retreat to the Mesa Central where skies are usually blue. Temperatures in the cave area in February and March range from the 40's during the mist storms to the high 80's in sunny weather. Winter is probably the most favorable time of year to visit the area. In summer the heat becomes unbearable.

GEOLOGY

This area is a southern extension of the Sierra Madre Oriental. It is a zone between the Mesa Central and the Planicie Costera where the terrain is rapidly descending. The caves are located in extensive outcrops of thick-bedded Cretaceous limestone. Outcrops of thinly bedded limestone occur along the road high above the Río Apulco but they are the exception rather than the rule. In the caves near the Jonotla road at an elevation of 4100 ft a layer of very cherty limestone was noted. Chert was also found near the end of Cueva de Xocoyolo at 4977 ft. Generally the dip of the limestones is low to the north. A large linear extent of cliff-forming limestones is visible in the Tecuatepec Canyon from Zoquiapán. The dip of the formations here was 5° to the north. Areas of localized deformation do occur as evidenced by a measurement near Nanacatlán (strike 150° dip 60° SW). Another observation at a quarry at 14.0 miles on the Apulco-Cuetzalan road log (strike 61°, dip 16° NW; light grey, very fine grain limestone, 8 to 24 inch thick beds) agrees more closely with the Zoquiapán observation.

Evidence of volcanics abound in the region especially southeast of the Río Apulco where the surface is deeply covered with volcanic ash. Pumice and obsidian are exposed in road cuts.

The northwest side of the Río Apulco is completely different. As noted above, there are large areas of limestone outcrop. If the limestone beds are continuous across the river, it would seem that there is a high probability of a mantled karst southeast of the river. Conversely, the karst northwest of the river is possibly exhumed. Near the Río Apulco there are limestone blocks surrounded by pumice. Many of the caves, especially ones with ready access to surface waters, contain conglomerate fills composed of resistant rocks (serpentine, red sandstone, obsidian, etc.) firmly cemented together. Del Myers suggests the cement is weathered volcanic ash. Further he states, "The conglomerates would perhaps best be considered a reworked, andesitic, lapilli tuff conglomerate." It is hard where it is exposed to running water but is less firmly cemented where it is high and dry. High velocity water polishes the conglomerate and it takes the appearance of a terrazzo floor. Many of the waterfalls in the caves are formed where streams plunge over ledges of this hard fill.

Another example of igneous activity is the falls of the Río Apulco just upstream of the highway bridge. The 50 ft waterfall is supported by a layer of fine-grained igneous rock.

There is considerable internal drainage in the Jonotla-Cuetzalan area. It is probably safe to say that no stream from this area goes to the Río Tecuantepec without having some of its course underground. The stream which enters Sumidero de Atepolihuit is perched upon alluvium until it reaches the cave mouth. Here the water goes underground and probably emerges in the canyon one mile to the north.

Along the Jonotla road water emerges from limestone springs on an impervious layer at 5030 ft and there are no known caves until 4100 ft. A similar event occurs along the Apulco-Cuetzalan road. There is no known cave passage between the end of Cueva de Xocoyolo at 4977 ft and the entrance of Octimaxal Sur n. 2 at 4150 ft. Evidently there is a change in lithology over this area which divides the limestone into upper and lower beds.

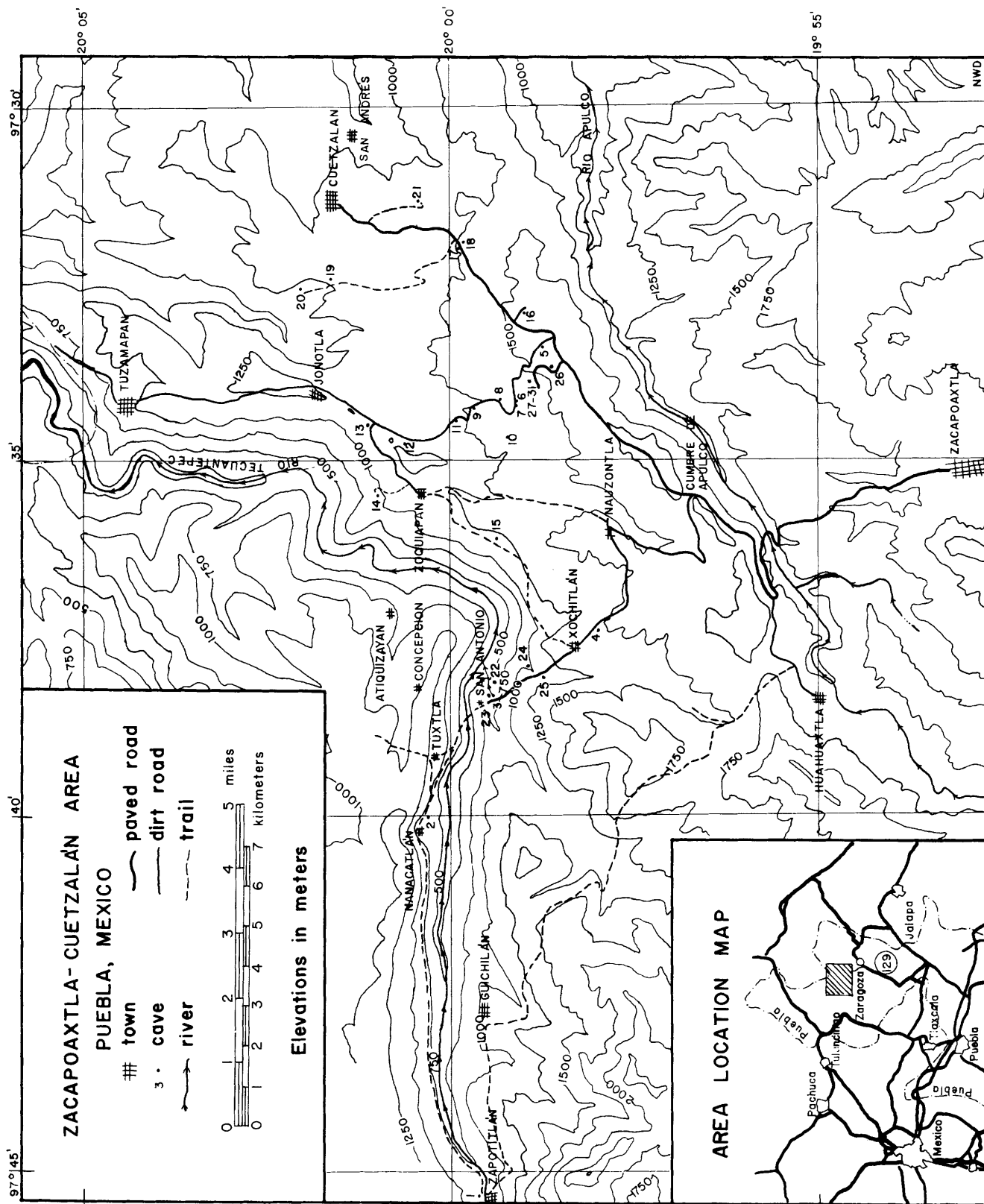
The caves contain evidence of both phreatic and vadose development. An example of a phreatic passage is the terminal 800 ft of Cueva de Xocoyolo which is an 80 ft wide, 40 ft high elliptical tube. This probably formed before a suitable exit for the waters developed, draining the passage.

Vadose features—canyon passages, waterfalls, and dome pits are common. Of particular interest is the subterranean meander bend cut-off in Sumidero de Atepolihuit. This probably formed when a downstream exit for the cave stream opened, lowering the local base level and steepening the cave stream gradient.

ACCURACY OF MAPS

Included in this report is a map of the Zacapoaxtla-Cuetzalan area. It is based on the 1:100,000 series topographic maps of México. In general the topography on these maps is correct but the cultural features are apt to be wrong or misplaced. I have fitted the roads and trails to their correct locations to the best of my ability from notes taken in the field. Names of towns have been changed to fit the names used locally. In most places the road logs will indicate more distance between points than is shown on the map. This can be expected since the roads make a right angle turn every couple of hundred ft. This does not show on the map. Elevations of caves and features are based on an altimeter setting of 4760 ft at the Río Apulco bridge. Other bench marks were established to reset the altimeter on a daily basis. (See map, p. 156.)

The map of Grutas de Poncho Sierra was done as a simplified plane table survey using a hand held brunton from several points on a nearby hillside. It cannot be considered very accurate.



ROAD LOG FROM RIO APULCO TO CUETZALAN

Total Miles	Partial Miles	
0.0		Río Apulco bridge 4760 ft msl (all other elevations are based on this elevation.)
1.9	1.9	Road to Huahuaxtla on left (2.5 km), 5300 ft
3.8	1.9	Pull off on right—view of waterfall over canyon wall and falls of Río Apulco.
3.9	0.1	La Cumbre—road to Nauzontla (5 km) and Xochitlan left, 5570 ft.
7.1	3.2	Possible entrance below the road on left.
7.7	0.6	Village of Coctapqual.
7.9	0.2	Possible pit in field 60 yds from road on the left.
8.5	0.6	Possible pit on inside of curve to the left.
8.6	0.1	Dirt road to Santa Lucia to left. See Supplement for road log (JRR).
9.2	0.6	Dirt road on left to Jonotla (12 km), 5380 ft.
10.4	1.2	Possible hole at left 100 ft from road 5180 ft.
10.5	0.3	Road on right to Cueva de Xocoyolo, 5190 ft. (No. 16)
13.0	2.5	View of the huge entrance of Sumidero de Yohuatichan to the right, 4345 ft. Fields of karst pinnacles are visible above the entrance. To the right 90° from the entrance is a 100 ft waterfall dropping into the valley which ends at the cave entrance.
13.4	0.4	Quarry on right suitable for camping, 4215 ft.
13.5	0.1	Rafael Arellano's house on right. He's a local contact. Octimaxal Sur Numero 1 on left below the road, 4150 ft. (No. 17)
13.6	0.1	Trail on left to the Atepolihuit caves. (Nos. 19, 20)
13.7	0.1	Trail to the right 200 yds to a 30 ft plus deep unexplored pit.
14.0	0.3	Quarry on right, 4040 ft.
14.4	0.4	School on the right, 3920 ft.
14.7	0.3	Stone road on right to Sumidero de Yohuatichan, 3820 ft. (No. 21)
15.2	0.5	Small side road left, 3780 ft.
16.4	1.2	Cuetzalan—trail on right to San Andrés and Chivostoc (Cave of the Goat) a 15 minute walk from San Andrés.

TRAIL LOG: HUAHUAXTLA–ZAPOTITLÁN–NANACATLÁN–XOCHITLÁN

It is safe to park a vehicle behind the school-town hall in Huahuaxtla and proceed from there by foot. Take the trail NW from town and descend perhaps 1000 ft into the valley. Follow the valley downstream to the NNW to a “Y” in the trail. At this point there is a house directly ahead. One branch of the trail goes to the right of the house and into a canyon. The branch to the left leaves the valley and crosses a small stream. A cabin ahead carries the sign “Calle de Zaragoza,” take the trail uphill to the west. After climbing, the trail goes downhill into the valley to the NW. Although it can’t be seen, the town of Paguata is directly below the trail. In the distance to the NW the church spire of Guichilán can be seen. The time on the trail to this point is about 2 hrs.

Downhill past Paguata is the building La Estrella. Ahead the trail passes through an area of little cultivation. The trail goes down into a valley, across an ancient bridge, and back uphill toward Guichilán. This area with the jungle vegetation and clear mountain stream is one of the most beautiful encountered.

The time on the trail from Paguata to Guichilán is about 2 hrs. Take trails which stay high above most of the town. From here you can see both Guichilán and Paguata. Proceed up the stone road and continue uphill through the pass NW toward Zapotitlán. The trail is all downhill from Guichilán to Zapotitlán but the walking time is at least 3 hrs.

In Zapotitlán there is a boarding house north of the plaza which serves meals to travelers. West of the plaza is a hotel of questionable value. It does provide a roof if it’s raining. The cost is 10 pesos for a room and one bed, 20 pesos for a room and 2 beds. In case of difficulty there is a teacher in town named José Lufs Mineses Reyes who speaks some English.

Leave Zapotitlán via the Puente Morelos across the Río Zempuala (same as the Río Tecuan-tepec further downstream). The trail to Grutas Karmidas (no. 1 on the Zacapoaxtla-Cuetzalan Area Map) is on the left. To the right and downriver the path climbs toward Nanacatlán. About 1.5 km from Zapotitlán the path passes a sandstone arch 10 ft high, 12 ft wide, and 7 ft thick. Nanacatlán is about 3 hrs walk east of Zapotitlán and about 1000 ft above the Río Zempuala.

Follow the stone road east through town, taking the second side road to the left. Continue on a trail east along a contour for about 1000 ft. From here you can still see the church dome. There is a small side trail here which goes down toward the river to the south to Cueva Lracauch (no. 2 on the Area Map).

The main trail continues eastward and downhill. In about 1 km there is a trail to the left to Tuxtla and 1 km further the trail intersects the stone road from the same town. Take the stone road downhill toward the river and the bridge with this inscription: Est. Hid. Mapilco Pue. The time for the walk from Nanacatlán to the bridge is about 1.5 hr.

Below the bridge the river has cut a 60 ft deep 20 ft wide canyon in the limestone. Water comes out of the limestone above the apparently harder bed on which the bridge is situated and cascades over the edges of the canyon. There are undercuts in the canyon wall which look like caves from above. Upstream from the bridge is a stream guage and on the hill above a simple weather station is situated. The flat area near the bridge is an ideal place to camp.

One hour walk and 1000 ft above the bridge on a spur ridge between the main Zempuala canyon and a side canyon is the town of San Antonio. This town consists of only a few houses. The main trail from the town follows a contour up the north side of the side canyon and down the south side. There is a small foot path, a short cut, just outside of town, which goes steeply down the side canyon wall to a stream. There are what may be small cave entrances along this trail. Just downstream from the intersection of this trail and the stream is a spring in the south wall of the canyon with a discharge of about 20 cfs (see no. 3 on the Area Map). The spring comes from a 15 ft wide opening in horizontally bedded limestone with ceiling pendants which

touch the water. The floor is scalloped limestone. At a point 50 ft inside the entrance there appears to be no airspace.

To cross the stream one must either wade or boulder hop. The foot path goes steeply up the other side of the canyon to the main trail. From here it is a 1/2 hour hike to San Bernardo. Between San Bernardo and Xochitlán, 45 minutes by foot, there is an outflow of water on a resistant bed of limestone at its contact with the higher beds. This is much like the conditions observed at the bridge over the Río Zempuala.

CAVE DESCRIPTIONS

Grutas Karmidas - Grutas de Zapotitlán (No. 1 on the Zacapoaxtla-Cuetzalan Area Map)

The cave is operated as a commercial venture by the town of Zapotitlán. To enter the cave 2.50 pesos must be paid at the store on the northwest corner of Calle Metamoros and the road leading to the Puente Morelos over the Río Zempuala. To find the cave, cross the bridge and turn left. Take the first right turn across a cornfield and climb the mountainside (Cerro Tama-xatmi) toward the cave. The entrance is about 100 ft above the river and 600 ft from the bridge in a straight line. Water emerges from a spring directly below the entrance. (See map, p. 160.)

From the entrance the cave goes NW about 60 ft as a 3 ft wide, 5 ft high walking passage with a dry floor. From this point on, the passage is floored with a stream which exits to the right and drops down a shaft. The passage continues, turning right, then left for 100 ft or more. This first 160 ft of passage has been artificially enlarged to provide easy access to the room beyond.

The passage enlarges to 5 ft high and 10 ft wide with water flowing over the cobble-covered floor. The ceiling of this passage is a white calcareous sandstone which dips at about 10° toward the entrance. The passage at this point follows the dip, going about 150 ft up dip to the Salón Blanco. This room averages 30 ft high and 30 ft wide and is about 300 ft long. All formations are either pure white or clear with minimal vandalism considering the accessibility of the cave. The room is terminated upstream by white flowstone and formations. The ceiling here is covered with helictites, some up to 6 inches long (see photographs, p. 161, 163.) A continuation of the passage may exist beyond the formations; however, the guide said that this was the termino.

The only cross passage is located in the middle of the room. To the west there is a 20 ft or greater drop and the passage may continue. This was not explored. To the east is the Salón de las Brillantes. This short passage is an alcove in the east wall of the main room. It contains a beautiful reflecting pool and a frosting of white flowstone (see photograph, p. 161.)

There is evidence that the entire cave was once filled with graded stream sediments. In some areas, banks of fill reach the ceiling. The cave was subsequently emptied of its fill by the pirating of a small vadose stream.

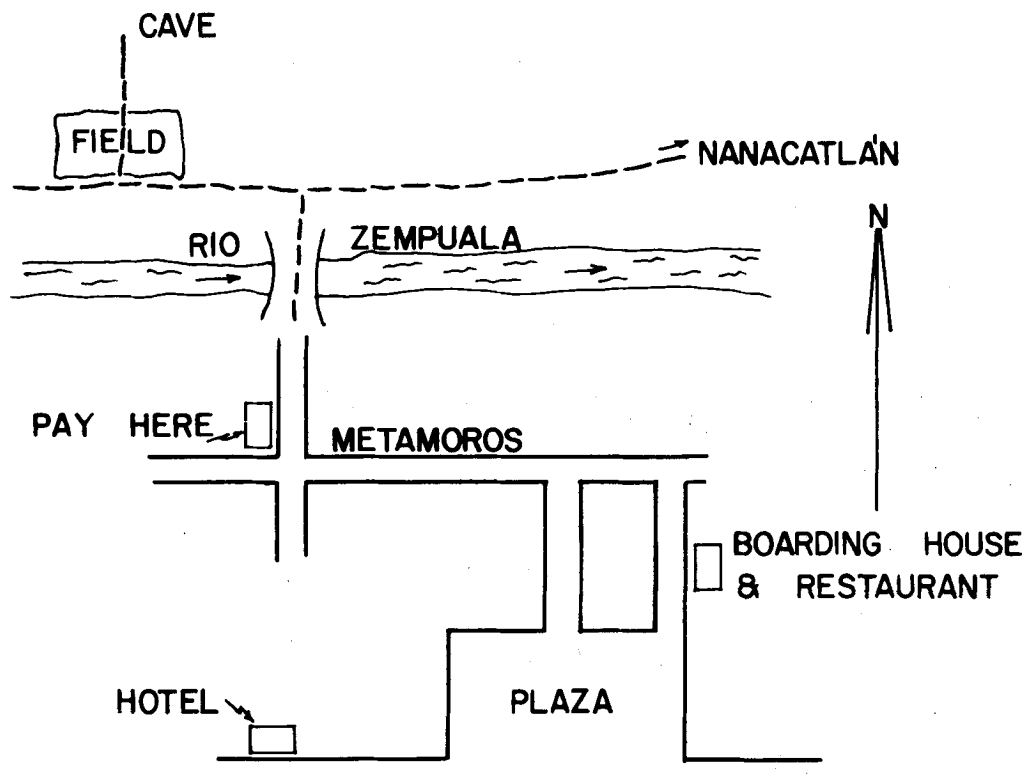
Lracauch - Grutas del Baño (No. 2 on the Zacapoaxtla-Cuetzalan Area Map)

About 1000 ft east of the edge of Nanacatlán there is a trail to the left which descends along an arroyo toward the river. At the turnoff, the church dome in Nanacatlán is still visible. The

entrance is at least 300 ft below the main trail in the northwest face of the arroyo, just west of a triangular-shaped limestone cliff. In the vicinity of the cave the strike is 150° and the dip is 60° SW.

The 8 ft high, 6 ft wide entrance is completely dry; however, after traversing about 120 ft of bedding-controlled passages, the explorer is confronted with the first of a series of pools. The first obstacle is an unavoidable chest deep pool. From the top of the flowstone mound directly across the pool and about 20 ft above it, the explorer turns left and descends over the backside of the mound to the second pool. Crossing this pool is more difficult than the first since there is only 4 inches of airspace.

From the far side of the pool the passage continues more or less straight for about 200 ft to a small room where the passage splits. Both divisions continue in approximately the same direction. One is a low passage which is apparently filled to the ceiling with water most of the time. Local cave explorers have been through here in drier weather however. The other passage goes up over breakdown for 200 ft to a 40 ft drop into a room greater than 40 ft high and 30 ft wide and over 120 ft long. The roar of water could be heard in the distance.



Location Map for Grutas Karmidas.



Reflecting pool in Salón de las Brillantes in Grutas Karmidas (Nevin Davis).



Helictites at the end of Grutas Karmidas. Water droplets give scale (Nevin Davis).

ROAD LOG FROM LA CUMBRE TO GRUTAS DE ATENO

Total Miles	Partial Miles	
0.0		Turnoff at La Cumbre de Apulco, 5570 ft.
1.1	1.1	Store and road to left to Zontecpan (1.2 km).
1.4	0.3	Possible crawlway entrance on left.
1.8	0.4	La Nauzonteca in valley below road on right.
2.8	1.0	20 ft diameter entrance to probable cave to right across valley and 150 yds from road.
3.6	0.8	Nauzontla town municipal building, 4895 ft.
6.4	2.6	Trail on left to Xochitl Cave (No. 4).
8.4	2.0	Xochitlán (3600 ft). Road straight through town leads to San Diego after about 4 km where two large caves are reported. Road is under construction. Road to right leads down through edge of town towards the Río Tecuantepec and San Bernardo. Take this road to Grutas de Ateno.
9.5	1.1	Cueva Vibora (No.25) on right. See Supplement for description.
10.0	0.5	Cross small stream which runs into Sumidero de Cuetzal Temanes to right. (No. 24) See Supplement for description. 2930 ft.
11.2	1.2	Trail to right past small hut and down canyon to river level. Trail along river to right leads to Grutas de Ateno (No.22) See Supplement for description and map.
11.5	0.6	Foot bridge over river. Road continues on other side under construction. Cross bridge and go up first small canyon on left after about 100 yds. Cueva de los Camarones is at head of canyon (No.23) See Supplement for description. Upstream from bridge are several small entrances to un-entered caves from which considerable quantities of water emerge.

(JRR)

CAVE DESCRIPTIONS

Xochitl (Flower) Cave

(No. 4 on the Zacapoxtla-Cuetzalan Area Map)

To reach the cave take the trail at 5.8 mi on the road log. The trail goes downhill past some ruins, over a barbed wire fence, and continues left on a contour around the hill to a second fence. Across the fence the trail continues more or less on a contour to a shallow valley with a stream. The cave entrance is in the hill to the left looking upstream almost directly uphill from the point where the path crosses the stream. The crawlway entrance is at the base of a 50 ft high cliff 20 ft from the edge of the field

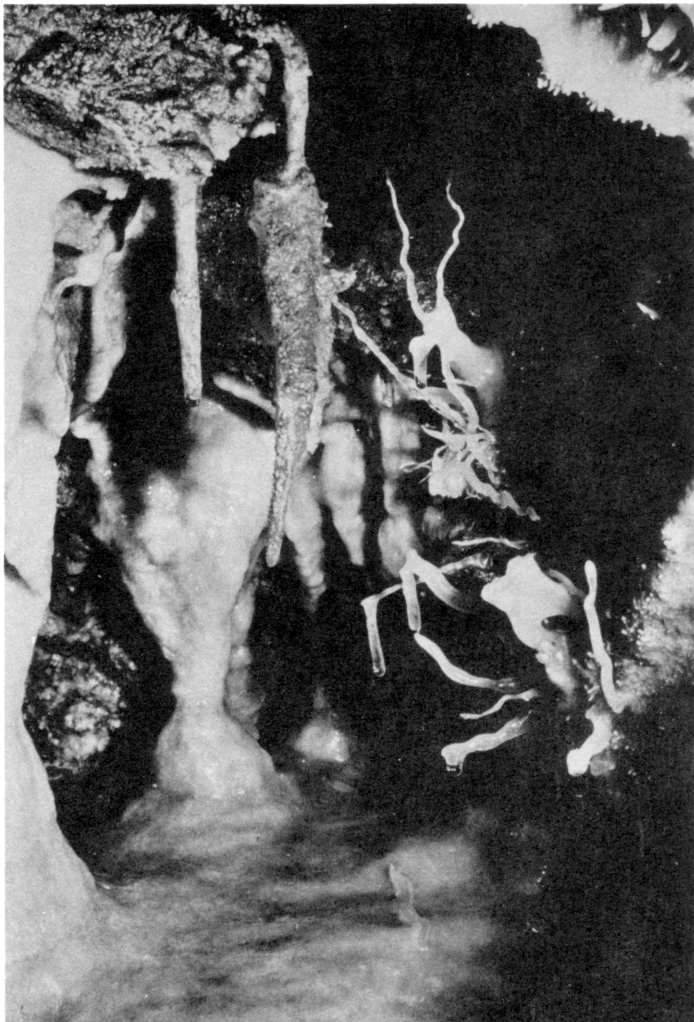
The passage begins as a straight, joint-controlled corridor of triangular cross-section with little change in elevation. The passage is mostly walking height interspersed with short lengths of hands and knees crawlway. Vampire bats roost in parts of this passage. The nature of the cave changes entirely 450 ft from the entrance. Here there is a 10 ft drop to a 20 by 20 ft stream passage.

Upstream the passage continues 450 ft to an intersection. The passage to the right goes

70 ft to a low water crawl. This was not investigated. Straight ahead the passage becomes a narrowing crevice partially choked with formations. It becomes difficult to traverse after 370 ft.

Downstream from the drop the passage maintains a 20 by 20 ft cross section. In many places the floor is covered with shallow water while in other places the floor is solid bedrock. There is a series of domes 1100 ft from the drop; the passage appears to end. Against the wall of one of the domes there is a squeeze between breakdown blocks to a continuation. The passage is partially blocked in 200 ft by breakdown. Beyond this is more passage floored with deep pools. A large dome is encountered on the right 400 ft from the second passage block. The dome is 30 ft in diameter and at least 100 ft high. Further downstream the passage breaks into a series of small passages one of which was followed for 300 ft to another passage constriction. The air moving through the cave exits through this hole. There is probably another entrance somewhere beyond this point. The water leaves the traversable passage 200 ft downstream from the large dome.

In all over 3300 ft of passage was explored. At least 900 ft of this was virgin. The rest was discovered in 1962 by Herminio Ramírez López and Mario Hernández Rosales, school teachers in nearby Xochitlán.



Helictites and water droplets near the end of Grutas Karmidas (Nevin Davis).

ROAD LOG OF DIRT ROAD TO JONOTLA AND TUZAMAPAN

Total Miles	Partial Miles	
0.0		Left turn from paved road onto dirt road to Jonotla. 5380 ft.
0.3	0.3	There is possibly a pit or cave entrance 100 to 200 ft below the yellow school to the left below the road.
0.6	0.3	Pit directly below road on the left. There is a cave below the pit. (No. 5)
0.9	0.3	Trail to pit and cave mentioned above.
2.8	1.9	Cueva Escalera 30 ft left of road (No. 6)
2.9	0.1	Walk-in entrance to Cueva de la Milpa, 100 ft left of the road, just below karsted rock in milpa. (No. 7) (For description of this cave see Supplement, p.185.) Ahead by the road is a rural school.
3.1	0.2	Valley to the left of the road could be a collapse sink.
3.2	0.1	Cuevacita Ekimita to the right (No. 8).
3.3	0.1	Sink to the right of the road is a continuation of the linear feature at 3.1 and 3.2 miles.
3.7	0.4	Shaft plugged with dirt 10 ft from left side of road.
3.9	0.2	The 108 ft entrance shaft to Grutas de Tenextepec is 200 ft left of the road. (No. 9)
3.95	0.05	Ezequiel Mora lives in the white house on the right of the curve. He is a valuable source of information on the area.
4.5	0.55	The road passes over Grutas de Poncho Sierra, 3870 ft. (No. 11)
6.1	1.6	In this area a trail to the left gives access to a large sinking river cave we call Sumidero de Jonotla for want of a local name (No. 12).
6.5	0.4	On the left is the road to Zoquiapan. Also about 100 yds from the intersection is Grutas de Jonotla (No. 13).
7.1	0.6	Above the road to the left is El Peñon, a church built at the base of a limestone pinnacle. At some time in the past, part of the pinnacle fell through the roof of the church and broke the altar statue. The locals now use the broken statue in worship thinking the event was an omen.
7.8	0.7	Left turn to Jonotla. The deep canyon to the right probably collects water from all caves on this log to this point with the exception of Sumidero de Jonotla.
8.8	1.0	Very karsted rocks evident left and below the road.
11.1	2.3	Cave entrance visible 200 yards across the valley to the right.
12.5	1.4	Town of Tuzamapan.
13.8	1.3	Spectacular view of mountains, canyon, and Río Tecuantepec 1600 ft below. There is an interesting feature across the canyon. A trail winds up from the river and disappears into the shadow of a canyon or cave entrance. Elevation about 2300 ft at the road.
15.1	1.3	As of March 1972 the road terminates here. Road construction is in progress.

CAVE DESCRIPTIONS

Unnamed Cave and Pit

Cave and pit at 0.6 miles on the Jonotla Road Log. Elevation at the cave entrance is 5140 ft. No. 5 on the Zacapoaxtla-Cuetzalan Area Map. The entrance to the cave is in a dolina 120 ft vertically below the road. The cave trends north and NE of the entrance. As much as 200 ft of small passage is developed along joints perpendicular to the bedding plane. Vertical development of the cave has been stopped by an impervious layer in the floor of the passages. The cave was mapped.

There is a pit at least 60 ft deep located 66 ft higher and to the east of the cave entrance. The pit appears to be a crevice 15 ft long and 4 ft wide with its major axis at 333° parallel to the cave entrance passage. The pit was not entered.

Water sinks about 100 ft to the left as one faces the cave entrance. This water probably accounts for the small stream in the cave.

In the vicinity of this cave water emerges from springs above a resistant layer at an elevation of 5030 ft. From these springs the water plunges over small waterfalls and becomes entrenched in steep arroyos. This happens in at least three of the small local drainage basins.

Cueva Escalera

(No. 6 on the Zacapoaxtla-Cuetzalan Area Map)

The entrance is in a clump of brush about 30 ft to the left of the road. A wooden ladder with many broken rungs near the top is sitting in the 40 ft drop. For safer ingress a rope should be used. The first portion of the drop is against the wall but the last 20 ft is free.

The shaft leads into a room 30 ft wide and about 20 ft high. The passage goes 100 ft downstream under the road to a choke of large breakdown blocks. Upstream the passage continues over piles of flat slab breakdown for 800 ft to terminal breakdown. A draft of air flows through the cave from the terminal breakdown to the entrance. The stream stays about 20 ft below the breakdown near the left wall. The passage height is no lower than 4 ft and no higher than 20 ft. The maximum width is perhaps 40 ft.

Remarkable are the piles of calcite sand between the rocks. About 150 ft upstream from the entrance against the right wall is a crater in the sand. Against the wall is a small hole with a 20 ft pit directly below. Water drops into the pit from an unseen place, and air blows from the hole. The ceiling of this cave is very cherty limestone.

Cuevacita Ekimita and Unnamed Nearby Cave

(No. 8 on the Zacapoaxtla-Cuetzalan Area Map)

The entrance to this cave is in a 100 ft deep karst fenster. The side of this depression toward the road is a steep slope which gives access to the entrance. Upstream, to the right, the passage is walking height for about 50 ft with a stream covering the floor. At the end it breaks into smaller passages with water coming from a dome and a steeply descending stream channel.

Downstream the stream enters a 15 by 15 ft entrance and the passage is immediately blocked by breakdown and dirt. On the right against the wall is a hole in the breakdown. This leads to a 200 ft long section of meandering canyon-like stream passage with a very irregular cross-section. There are numerous short side passages all trending steeply upward with water cascading down them. The main passage ends in a pool with a low ceiling. There is a strong

breeze blowing over this pool.

There is a continuation of the linear sink feature in which Cuevacita Ekimita is located about 500 ft down the road toward Jonotla. There is a path from the road to fields in the sink. On the wall toward the road a 20 ft waterfall emerges from a cave entrance and disappears among house-sized boulders in the bottom of the sink. The volume of water is about 1 cfs, much more than the volume rate of flow in Ekimita. This cave was followed upstream in the general direction of Ekimita for 200 ft. The cave continues 10 ft wide and 20 ft high with deep pools on the floor. The passage is a typical pothole passage. Water from the cave probably emerges in the deep canyon east of Jonotla.

Grutas de Tenextepec

(No. 9 on the Zacapoxtla-Cuetzalan Area Map)

To the left of the road there is a small valley. Up this valley about 200 ft from the road is a crevice opening about 8 ft across and 30 ft long. The drop is 70 ft against a clean rock wall to a ledge and then another 38 ft through the ceiling of a large passage.

Downstream the passage passes under the road and in 240 ft intersects a large chamber and second entrance. This entrance is no more than 40 ft from the right side of the road and is directly below it. The chamber slopes upward to a 15 ft high marginally climbable rock wall. This entrance is difficult to use because of the brush and nearly vertical dirt slope above the wall. The chamber at this point is perhaps 100 ft by 60 ft with the short dimension lying parallel to the stream. This section of the cave ends in 160 ft in a complete siphon.

Upstream from the 108 ft entrance pit is a completely different story. The first 500 ft is a room 70 ft wide and about 70 ft high. The gravel floor is as flat as a billiard table with a braided stream running over it. Formations cover the walls and ceiling. At the end of this room the cave passage nearly doubles in width before it again narrows. For the next 400 ft it is floored with piles of large boulders. The passage narrows again and intersects a canyon passage from the right. At the intersection is a 20 ft pit down which the stream from the canyon passage cascades. The bottom of the pit can be reached by a climb through breakdown.

The canyon passage to the right is 15 ft wide and 30 ft high. The floor is solid rock with waterfalls and potholes. This sequence of waterfalls and wading pools continues for 600 ft to a room with a flowstone mound on the left. At the top of this mound is a well-decorated dry gallery with a flat dirt floor which doubles back and intersects the water passage near the ceiling. (See photograph, p.173.)

Beyond the flowstone mound room is a pool and unclimbable 8 ft high waterfall. This waterfall can be bypassed by a climb to a ledge on the left and a short traverse behind some large formations. About 300 ft beyond the waterfall the passage splits. The canyon passage to the right which is 15 ft wide and 30 ft high ends in 1000 ft in a mud plug. There is a going lead on the right about 350 ft before the end. The floor is solid rock with waterfalls and potholes.

The passage on the left splits again in 900 ft with the extensions gradually diminishing in size. There are two leads shown on the map in this section which will probably continue as long if not large passages. This area may eventually connect with Cueva del Muchacho. Of special interest is the large dome in the left passage near station 34. This was one of those impressive smooth, black-walled cylinders whose walls disappear into the eternal night overhead.

The cave is below a cherty limestone member as evidenced by the chert in the gravel fill. Black obsidian was also found in the gravel in the entrance room. Grutas Tenextepec is a water collection system combining water from various sources to form a stream exiting through the

terminal siphon. Of the 7000 ft of passage explored, about 6300 ft was mapped. (See map, p.168.)

About 200 ft to the right of the road at the Grutas de Tenex-tepec entrance are two pits with a dirt bridge between them. These pits may lead to cave passage beyond the downstream siphon. Water from this cave may emerge at entrance No. 14 of Grutas de Poncho Sierra.

Cueva (Sótano) del Muchacho
(No. 10 on the Zacapoaxtla-Cuetzalan Area Map)

To locate this cave walk east from the road up the valley past the pit entrance to Grutas de Tenex-tepec. Continue through a gate in the fence just beyond the pit and keep to the left. Climb to the top of the hill through the pasture. Along the eastern hill top is a path past several sinks, none of which appear to go anywhere. Continue along the path parallel to the valley bottom for 200 ft more or less to a point where the valley ends and the path descends into a large sink. The cave entrance is in a rock outcrop 70 ft above and to the left (north) of the sink bottom. Possible rigging points include several karst pinnacles. From the closest tie point, 130 ft of rope will just reach the bottom.

The rope is against the wall for all but the last 20 ft of this 70 ft drop. The 100 ft wide, 50 ft high room into which the entrance pit drops is a chaos of house-sized boulders steeply sloping down into a small stream passage. A small stream (less than .05 cfs flow in Feb. 1973) follows the breakdown-choked passage 120 ft to a low wide crawl. In 100 ft the ceiling of this crawl drops to within six inches of the surface of a lake across which a strong draft of air blows.

This cave probably connects with one of the upstream sections of Grutas de Tenex-tepec toward which it is headed. The length of this cave, entrance to end, is about 400 ft.

Grutas de Poncho Sierra
(No. 11 on the Zacapoaxtla-Cuetzalan Area Map)

This cave is a series of short passage segments and karst fensters, essentially a decaying cave system. On the surface, traverse between entrances is possible only by path or in some areas through cleared fields. In other areas, notably the northeastern sink, brush and dense jungle makes surface travel off of the trails impossible. Travel is often easier through the cave passages; however, swimming may be necessary.

Entrance No. 1 is 30 ft high and 15 ft wide. A triangular-shaped passage goes downstream 300 ft to entrance No. 3. Above entrance No. 3 is a natural bridge 40 ft high and 20 ft wide. A waterfall 10 ft high emerges from a side passage to the east. This side passage has been traversed for 100 ft to a point where turbulent water and deep pools make the going very difficult. The passage is floored with solid rock. The deep pools and waterfalls carrying 3 cfs of water in a passage 2 to 6 ft wide make for interesting scenery, but travel is nearly impossible.

The passage at entrance No. 4 is a continuation of that at entrance No. 3. A pool fills the passage from entrance No. 4 to entrance No. 5. To the right just inside entrance No. 4 is a skylight with a 40 ft vertical drop. Not long after entering the water on the traverse between entrance No. 4 and No. 5 is a passage on the left which leads directly to entrance No. 7.

Close to entrance No. 5 on the west wall of the arroyo is entrance No. 6. This is a 20 ft high 3 ft wide fissure which leads to a maze intersected by domes. These passages connect with the passage inside entrance No. 7.

Behind entrance No. 8 is a 150 ft long cave fragment with a skylight at its upstream termination. Entrance No. 9 leads to a short cave fragment with two entrances.

JONOTLA, PUEBLA, MEXICO

SURVEY	DATA.	PROBABLE	ACCURACY	± 10%
--------	-------	----------	----------	-------

SYMBOLS	ARE	AMCS	1967	STANDARD
---------	-----	------	------	----------

Month	Number of Visitors
January	950
February	250
March	450
April	650
May	850
June	950
July	1000
August	900
September	750
October	600
November	400
December	300

PASSAGE	WIDTH	& CROSS	SECTION	SCALE	2X
---------	-------	---------	---------	-------	----

Entrance No. 2 is a 20 ft high, 4 ft wide fissure passage which has a stream (0.5 cfs) flowing its entire length. The passage trends SSE (upstream) with a series of bends for about 500 ft to the first skylight, entrance No. 10. The drop from the skylight is about 50 ft. The floor of the passage is scoured rock with plunge pools, some perhaps as deep as 15 ft. Although the cave contains only a small stream in winter, it must receive a considerable amount of water in the rainy season, as witnessed by the logs jammed in the cave and the scoured clean walls to about 15 ft above the floor.

Beyond the first skylight is a pool which cannot be crossed without swimming. A dry side passage high to the left, which emerges in the main passage at the second skylight (entrance No. 11), serves as a bypass of the pool. The main passage maintains the dimensions 20 ft high by 4 ft wide at least to this point. A pool beyond the second skylight prevented further exploration. Entrance No. 13 is probably the upstream end of the passage. In the vicinity of this entrance there are sinks, entrances, and shafts everywhere. This area probably represents a cave in its last stages of disintegration.

Entrance No. 14 is a spring whose water sinks and probably emerges inside entrance No. 3 as the 10 ft waterfall. By crawling between breakdown blocks at entrance No. 14 it is possible to reach a fissure cave passage which goes; however, this was not explored. The water may be that which flows through Grutas de Tenextepec. (See map, p. 170.)

Sumidero de Jonotla

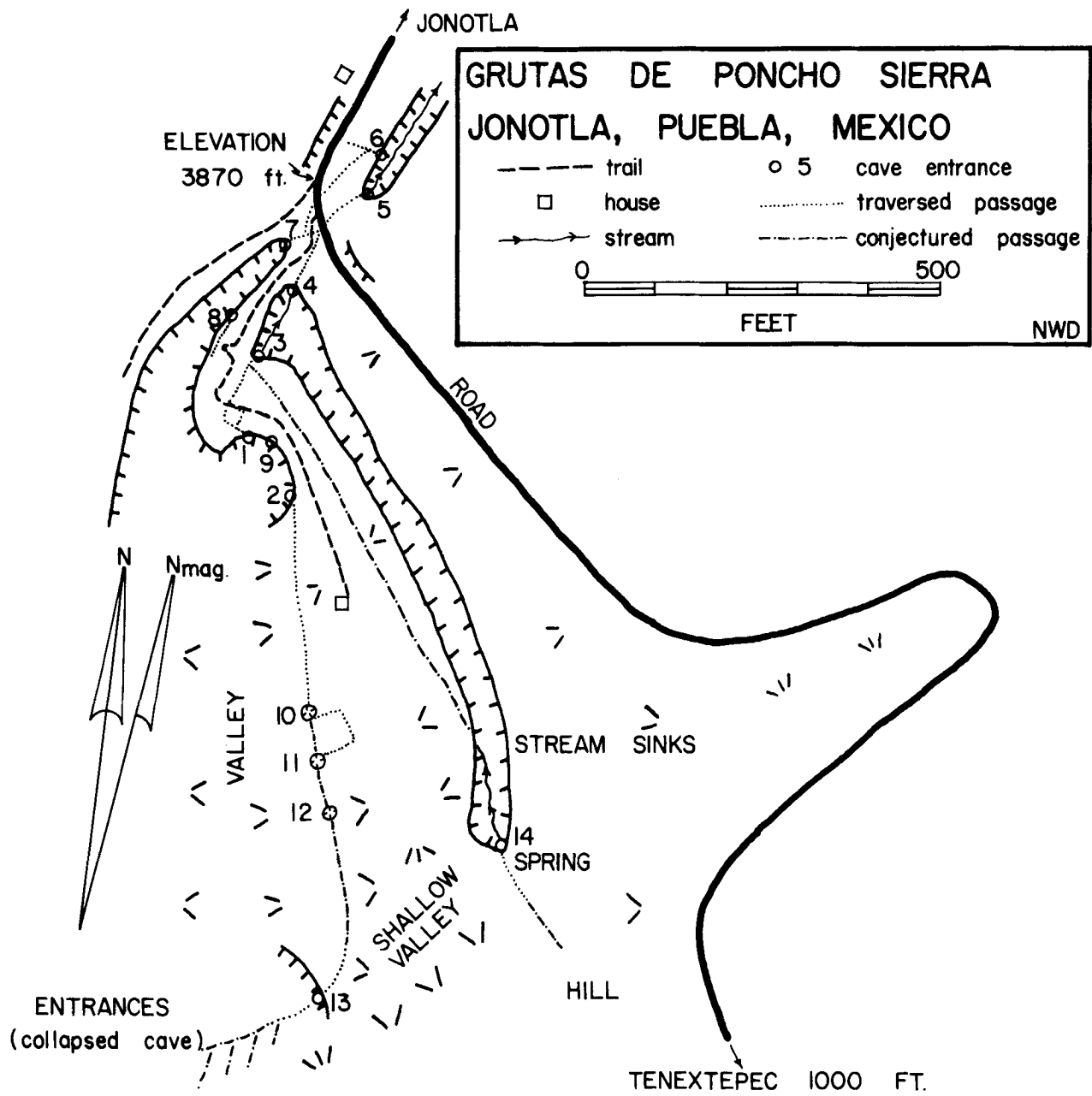
(No. 12 on the Zacapoxtla-Cuetzalan Area Map)

The 75 ft high, 250 ft wide entrance is located immediately under a high exposed cliff and is so deep in the valley that it can't be seen except from the hill above Grutas de Tenextepec. Outside the entrance the stream drops over a 20 ft waterfall and disappears into a mound of breakdown. Inside the huge entrance is a 150 ft skylight.

The passage, which averages 60 ft high and wide, is floored with colorful conglomerate containing a variety of pebbles, some of them serpentine. Water on the floor makes it necessary to wade. In places the water runs in fissures causing deep pools. Fifteen-hundred feet from the entrance is a huge wall of flowstone stretching for over 100 ft along the left wall of the passage before it bridges the entire passage.

This obstacle can be surmounted by traversing high on the left wall and descending to the stream on the other side of a flowstone constriction. In 200 or 300 ft the top of a 30 ft waterfall is reached. This is passed by climbing part way up the left wall and traversing about 100 ft beyond the waterfall. The stream can be reached via a climb down a shallow crevice in the passage wall. At this point the cave changes from a large elliptical tube to a high canyon and swimming appears to be the only route for further exploration. The passage here is about 70 ft high but only 8 to 10 ft wide at the water level. No ropes are needed to this point, but handlines may be needed to get back upstream against the current.

A total of 2900 ft of passage was explored, 2598 ft of which was surveyed. This cave is probably the upstream end of Grutas de Cuexalocstoc. (See map, pl. 1.)



ROAD LOG FROM JONOTLA ROAD TO ZOQUIAPAN

Total Miles	Partial Miles	
0.0	0.0	Intersection of Jonotla-Tuzamapan road and road to Zoquiapan.
0.05	0.05	Sinkhole on the right contains the small entrance to Grutas de Jonotla (No. 13).
0.4	0.035	Sinkhole on left 200 ft from road.
0.6	0.2	Sinkhole on right.
0.7	0.1	Very small spring on the left—sinks again.
0.75	0.05	Stone path into Cañon Tecuan-tepec.
1.3	0.55	Path on the right (3550 ft) to Grutas de Cuexalocstoc (No. 14).
1.4	0.65	Church in Zoquiapan.

CAVE DESCRIPTIONS

Grutas de Jonotla

(No. 13 on the Zacapoaxtla-Cuetzalan Area Map)

A 5 ft high, 4 ft wide opening at the bottom of a small, shallow sinkhole north of the dirt road to Zoquiapán gives access to the cave. Inside the entrance the passage is walking height and about 20 ft wide. The passage is full of broken travertine formations and small, mostly broken helictites. The water which enters the entrance in wet weather sinks in fill to the right just inside the entrance. About 400 ft from the entrance on the right wall is an area of translucent helictites, many of which are broken.

Several large columns precede a right angle turn of the passage to the left and a flowstone slope which drops 30 ft into a larger gallery. The passage continues 300 ft with dimensions of 40 ft wide and 30 ft high to a termination of breakdown and flowstone.

In general the cave is shaped like an "L" and contains about 700 ft of passage. No side passages were noted.

Grutas de Cuexalocstoc

(No. 14 on the Zacapoaxtla-Cuetzalan Area Map)

This cave is north of Zoquiapán and about 500 ft below the town. There is a trail on the right (elevation 3550 ft) 300 ft northeast of the church. This trail goes down into the Tecuan-tepec Canyon through the notch in the canyon wall 320° from the start of the trail. From a low point in the fields, the trail goes almost straight down through the brush. After approximately 200 ft the trail turns left along the face of a cliff. At one point a 30 ft long traverse of the cliff face is necessary. Travelling SW along the cliff, descend the log ladders to the pile of talus and dirt at the huge entrance to the cave (elevation 3030 ft). (See photograph, p.152.)

The screeching of golondrinas fills the air, and the sound of water can be heard splashing below the entrance. A stream of at least 3 cfs emerges from the cave, cuts through the talus at the entrance, and descends into the canyon. The dirt and talus probably originated, in part, from the fields above.

A trail penetrates the brush crossing the talus and dirt mound to the right side of the entrance. The path continues high on the right side of the greater than 100 ft by 100 ft passage with the stream in a trench below. Penetrating the mountain at a bearing of 154° the passage goes for 1200 ft to a large pool. Here for the first time it is necessary to use a light. Prior to this light from the entrance illuminated the way.

By crossing the stream before the pool and climbing the left wall, the first deep pool can be avoided. After climbing up the flowstone and rock slope, one descends to another deep pool; however it too can be bypassed by a traverse on the left wall. The third pool can be reached by crossing breakdown blocks. After swimming for 100 ft one can see that the ceiling above this pool descends to the water forming a very deep siphon. Further exploration here would require an aqua lung. Above the flowstone and rock slope, 40 or 50 ft above the floor, is a large upper gallery with a noticeable draft of air blowing from it. About 1700 ft of huge passage was explored.

It appears that the stream has pirated an older large cave and has removed most of a fill near the entrance. Back in the cave, however, part of this ancient fill of flowstone and rocks has remained; the stream has cut a canyon through it and now flows below the bridge of fill. There appears to be a high, unreachable level above the main cave. This is inhabited by the golondrinas. This cave is possibly the downstream end of Sumidero de Jonotla. The cave was shown to us by a local, Modesto Santiago.

Xiliapa - Mecatigpa - Neccal

(No. 15 on the Zacapoaxtla-Cuetzalan Area Map)

The name of the cave is one or all of the above. The people couldn't decide on a name! To find this cave start at the church in Zoquiapan and continue through town on the stone road. After passing through town, the road splits at a wooden cross. Take the stone road to the right and proceed past several sinkholes. Continue around a valley on the right staying at the same elevation to a cemetery surrounded by a stone wall. Past this point the road gives way to a dirt path. Take the left fork away from town and continue on the best trail across the fields, past some ruins and a small spring to a hill overlooking the Río Tecuantepec Canyon. The trail goes to the left and downhill slightly along the base of a 50 to 100 ft cliff. Below the trail is another cliff perhaps as high as 300 ft.

The trail leads to a field at a break in the lower cliff just below the upper cliff. The entrance to the cave is above this field at the base of the upper cliff, about a 45 minute walk from town.

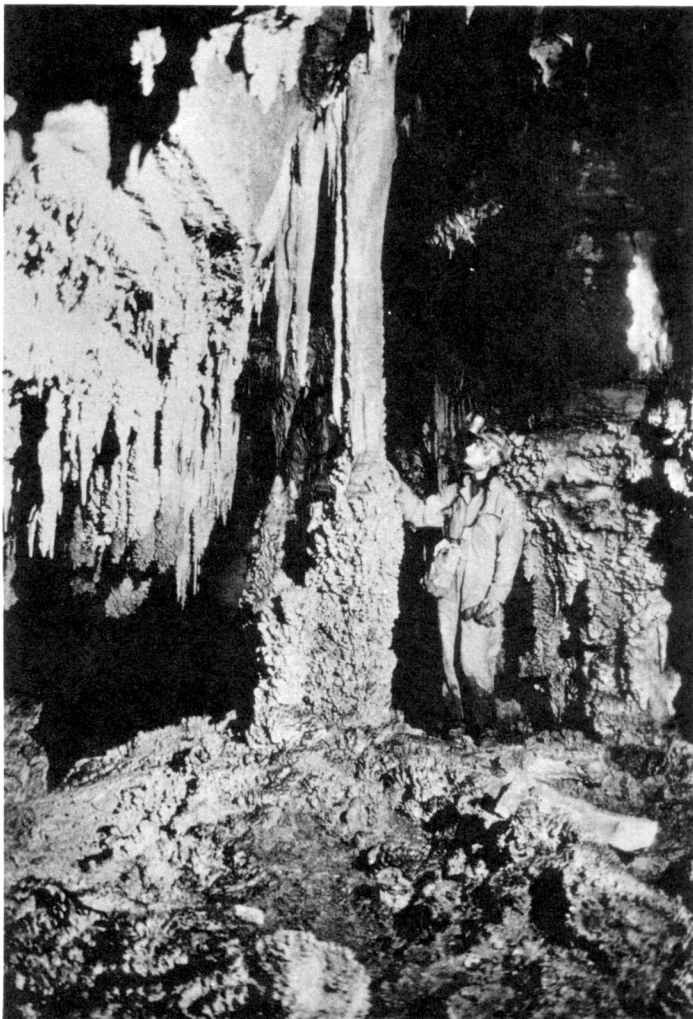
A short crawl leads from the 7 by 7 ft triangular-shaped entrance to the main part of the cave. Water collects from several domes and flows down a passage which averages 40 to 60 ft wide and 15 ft high for 1000 ft to an intersection with a similar passage from the right. This right-hand passage turns and parallels the entrance passage terminating after about 1500 ft.

The main passage continues downward with a stream and pools in its floor for the next 1400 ft. Here the stream leaves the main passage via a low side passage. The main passage continues 100 ft to a 15 ft drop negotiable with a handline. Just beyond the drop is a crawl up through breakdown blocks to a room 300 ft long and 70 ft wide with a 200 ft long side passage across the room from the entrance. The high end of the room terminates in slab breakdown from a breakout dome. Crystal wedging is probably responsible for much of this breakdown.

The most outstanding features of the side passage are the blood red extra-thin soda straws. There are large groups of these formations, some longer than 3 ft.

A 100 ft long crawl leads from the lowest part of the first room to a second room 500 ft long with some side passages in the breakdown. Running water can be heard below the breakdown along one wall.

Following the stream in the main passage one encounters a plunge pool passage 2 ft wide and 4 ft high with several 4 ft waterfalls and deep pools. This continues for perhaps 100 ft to an intersection with a passage which is geologically completely unrelated. The plunge pool passage intersects a passage 20 ft high and wide about 15 ft from the floor. A rope and ascending gear are necessary to negotiate this waterfall drop. The passage from this point goes 300 ft downstream to a siphon and 300 ft upstream to a series of domes. This passage was subsequently explored by Jorge Ibarra and the Grupo Espeleológico Mexicano and appears to continue. The main features of this cave are its red and orange formations, particularly the long red soda straws. The cave may be several hundred feet deep. The depth is difficult to tell without a survey since the cave gently descends for its entire length. Out of a total of 5800 ft of passage explored, the cave contains over 5500 ft of walking height passage and was incompletely explored.



Formations in the upper gallery in Grutas de Tenex-tepec (Nevin Davis).

ROAD LOG FROM DIRT ROAD TO CUEVA DE XOCOYOLO

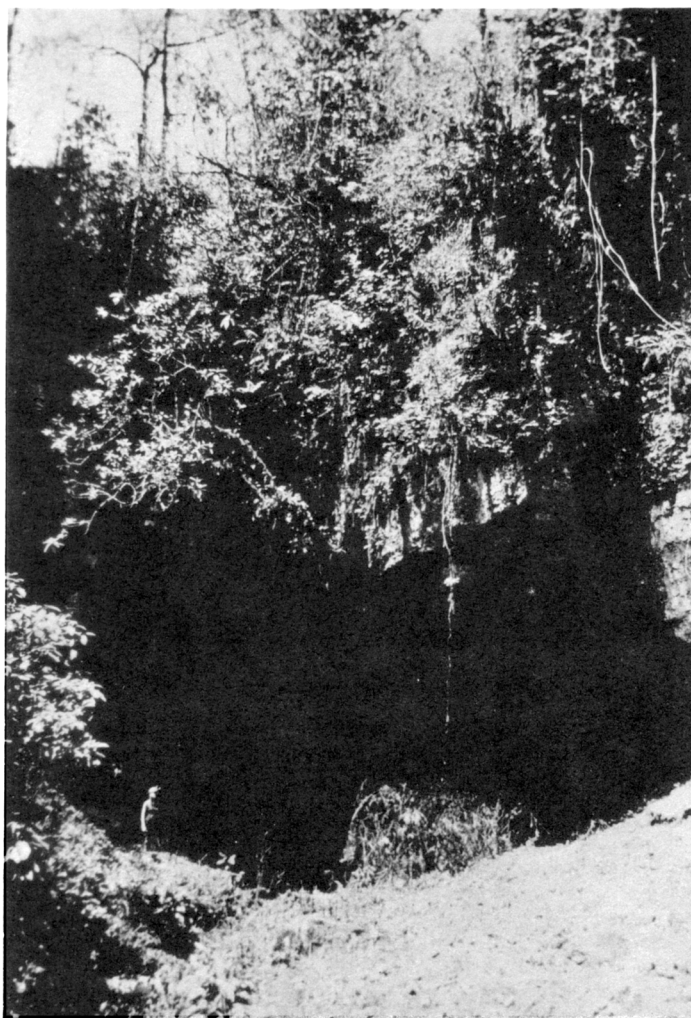
Total Miles	Partial Miles	
0.0		Turnoff, Apulco-Cuetzalan road, 5190 ft.
0.55	0.55	Cueva de Xocoyolo directly below road on right (No. 16). Possible cave in karst tower above the road on the left.

Cueva de Xocoyolo

(No. 16 on the Zacapoxtla-Cuetzalan Area Map)

The entrance to the cave (elevation 5100 ft) is an 80 ft wide 38 ft high opening in horizontal limestone 70 ft below the road. In March 1973 a stream of 0.2 cfs flowed into the entrance. Two hundred feet further into the cave this water plunges 8 ft over the first of a series of waterfalls. Beyond this waterfall the passage splits into an upper and lower passage with the passages rejoining in 300 ft. (See photographs, below, p. 175-176.)

Entrance to Cueva de Xocoyolo looks much like a "typical" West Virginia cave entrance (Nevin Davis).



The upper passage has much breakdown and in one place is almost choked with formations.

In the lower passage carrying the stream, flowstone lines the ceiling and left wall. These formations have obviously been redissolved by the cave stream.

As in most of the water caves in this region, debris (logs, weed, nuts, etc.) lines the floor of the passage. In this cave there is an additional feature of pockets of quick mud in which you sink a foot or more.

From the entrance to a point 1390 ft into the cave no rope is necessary and the cave gradient is shallow. At this point the cave becomes more canyon-like and in a series of 5 drops the cave descends 57 ft in the next 400 ft. The first of these drops (only 4 ft) would not require a rope if it wasn't an overhang into 5 ft of water. The next two drops, 20 ft and 15 ft require the use of a rope.

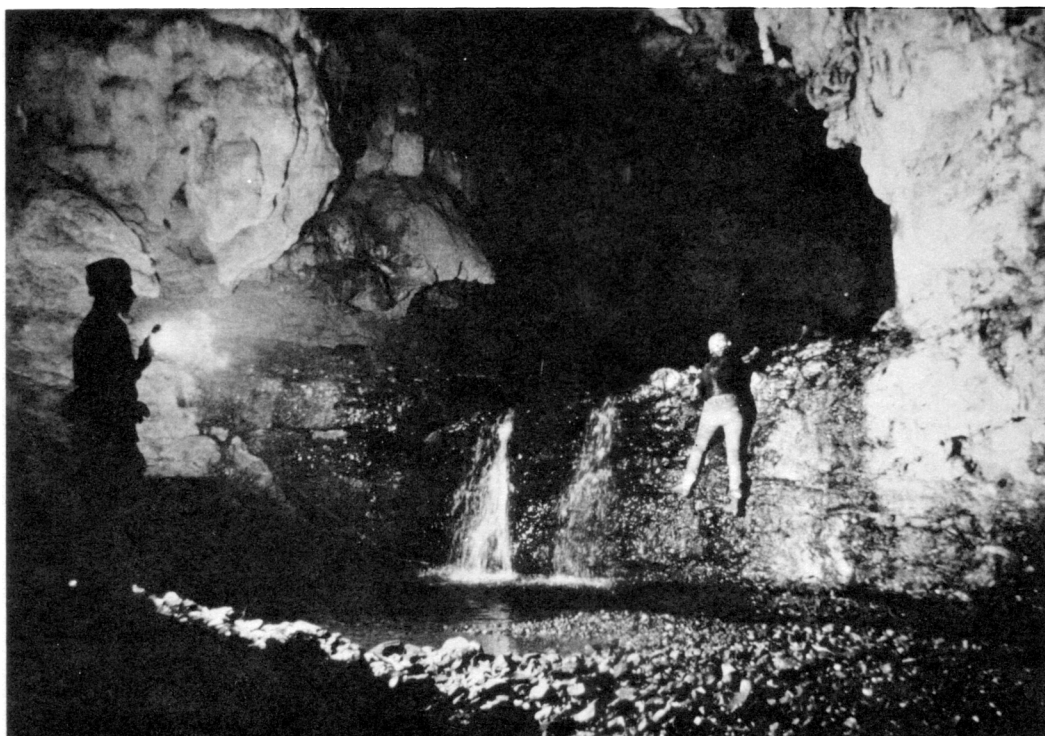
From the last 3 ft drop to the end of the cave some 800 ft further down the passage, the cave descends only 12 ft. This last section of cave is a huge corridor 80 ft wide and 40 ft high shaped somewhat like an elliptical tube.

The passage ends in a breakdown plug of cherty limestone blocks against which is wedged more debris washed in from the entrance.

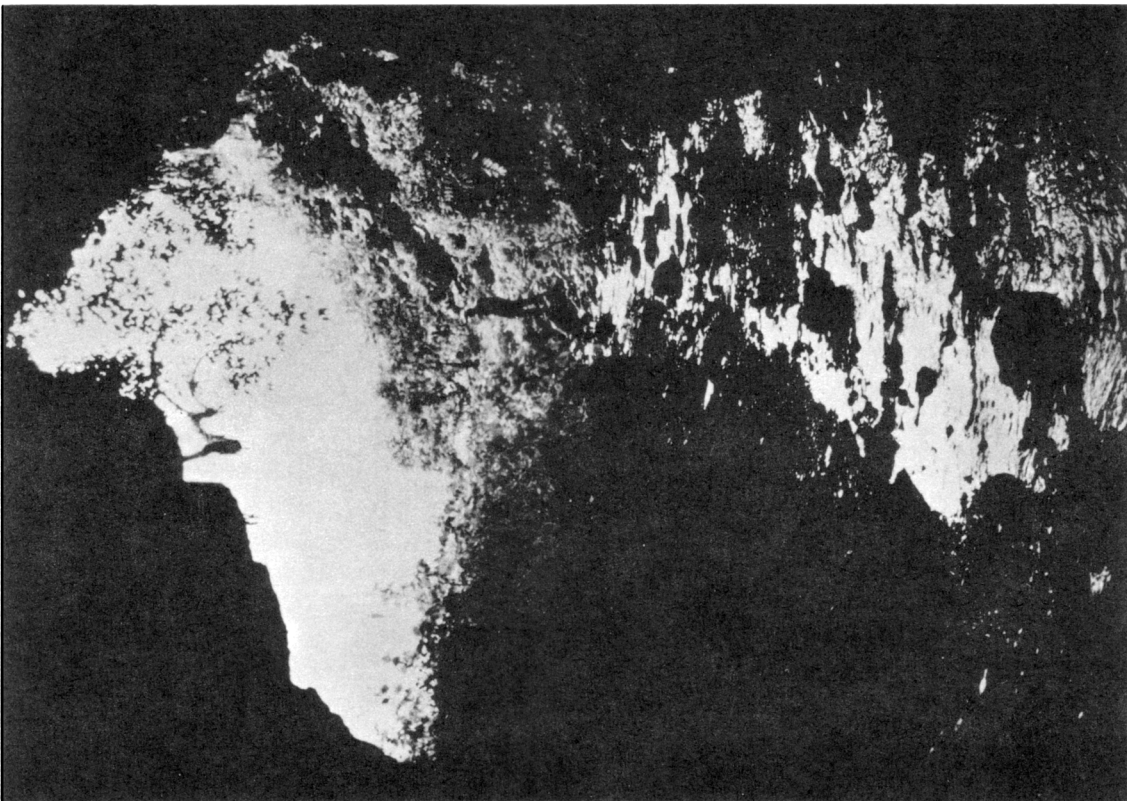
Cueva de Xocoyolo contains 3098 ft of passage (horizontal component) and is 123 ft deep. (See map, pl. 2.) The cave pattern is meandering following the northerly dip. (The dip was measured at Zoquiapan as 5° N which probably represents the regional dip.)

There is another cave (Cueva Murciélago de Xocoyolo-JRR) in the sink 110 ft from the entrance to Xocoyolo. This cave has two entrances about 5 ft high and 10 ft wide. The lower entrance has a small stream emerging from it. The several hundred feet of passage here is the home for a colony of bats.

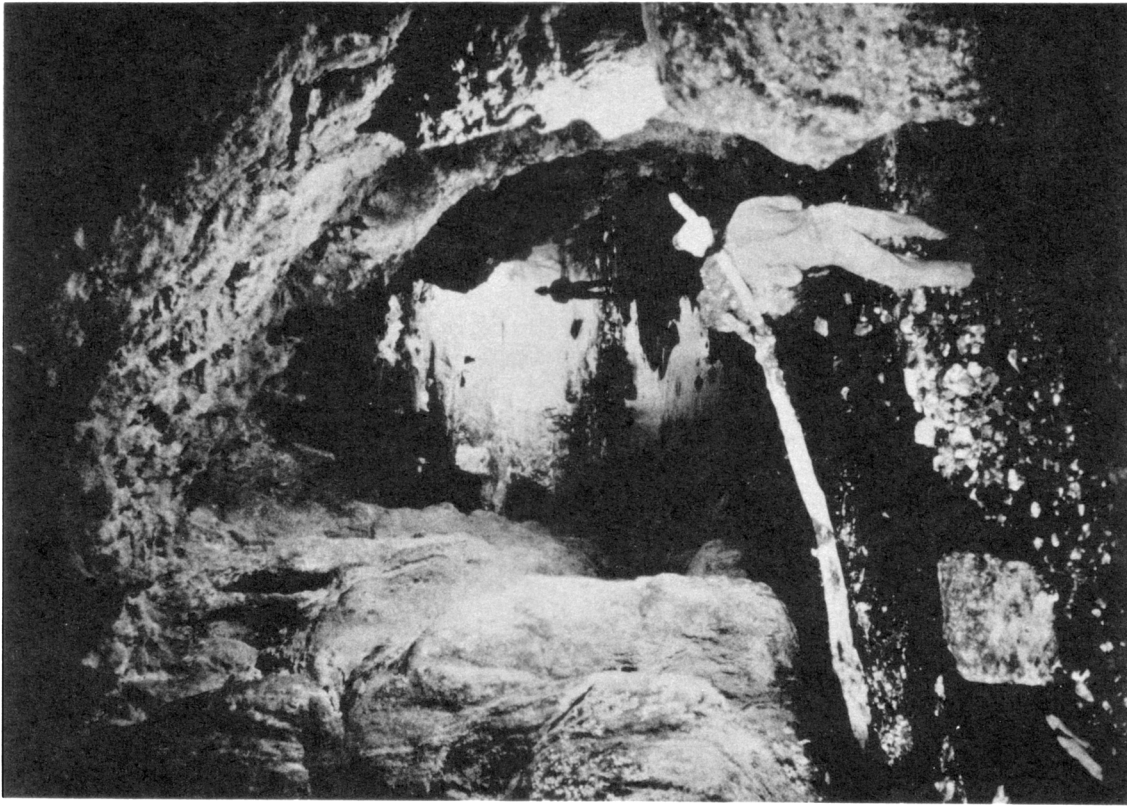
The locals say that there is a cave in the karst tower above the entrance to Xocoyolo Cave. This is just above the parking spot.



The 8 ft waterfall 200 ft from the entrance of Cueva de Xocoyolo (Nevin Davis).



The entrance of Cueva de Xocoyolo (David McKenzie).



Looking downstream from the entrance room of Cueva de Xocoyolo (William Elliott).

CAVES ACCESSIBLE DIRECTLY FROM THE APULCO—CUETZALAN HIGHWAY

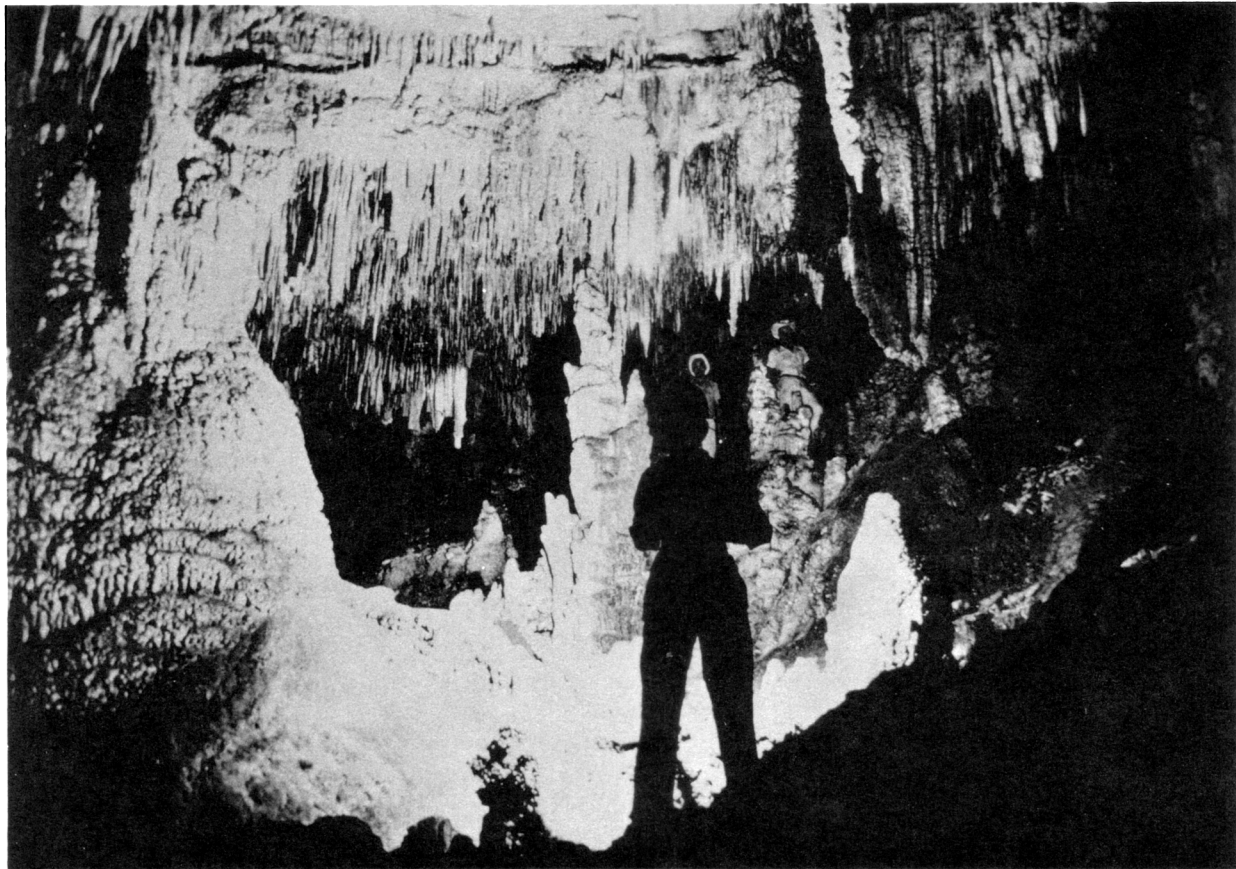
Octimaxal Sur Numero 1

(No. 17 on the Zacapoaxtla-Cuetzalan Area Map)

Travelling toward Cuetzalan on the right side of the road there is a whitewashed stone house with a tile roof. This is the house of Rafael Arellano. Just past the house the road curves to the right. The small brush covered entrance (elevation 4100 ft) is in the sinkhole 50 ft below the left side of the road.

The floor slopes steeply downward for the first 150 ft and is scree-covered, making footing difficult. The passage follows the dip, the ceiling being perfectly flat bedding exhibiting prominent joints. These joints more often than not have travertine formations hanging from them. A very small stream flows down the floor in dry weather and has probably cut the canyon in the floor. There were no side passages noted.

Nine-hundred ft from the entrance is a large flowstone mound from floor to ceiling and wall to wall. The stream has cut a small passage under the mound but this becomes too small to follow. By climbing the flowstone mound to the ceiling and travelling through the formations in the downstream direction, entrance may be made to a continuation of the main passage. The floor



Formations on a high ledge in Octimaxal Sur n. 1 with Rafael Arellano and Juan Mendez looking from behind them (Nevin Davis).

OCTIMAXAL SUR # 1

CUETZALÁN, PUEBLA, MEXICO

BRUNTON & TAPE SURVEY BY NEVIN DAVIS, JUDY DAVIS

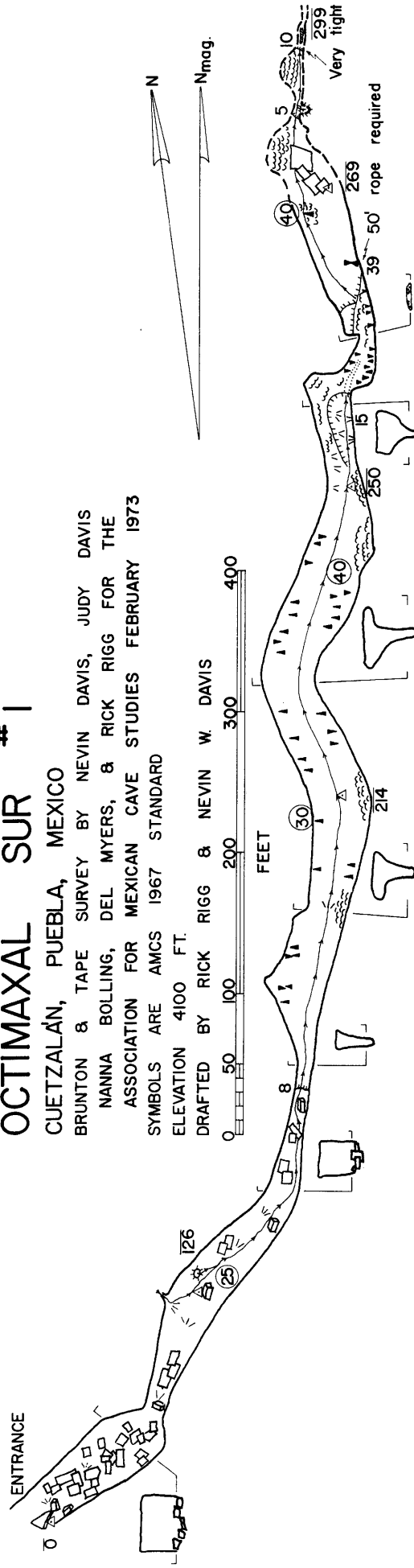
NANNA BOLLING, DEL MYERS, & RICK RIGG FOR THE

ASSOCIATION FOR MEXICAN CAVE STUDIES FEBRUARY 1973

SYMBOLS ARE AMCS 1967 STANDARD

ELEVATION 4100 FT.

DRAFTED BY RICK RIGG & NEVIN W. DAVIS



of the passage may be reached by a 39 ft drop over smooth flowstone. The passage continues 200 ft to an almost complete flowstone choke. At the end of the explored passage is a tight 10 ft drop into a pool. No circulation of air was noticed at this point. (See photograph, p.177.)

The total length of the passage is 1159 ft (1059 ft surveyed and 100 ft sketched) and the cave drops a total of 284 ft (269 ft drop surveyed and 15 ft total sketched beyond the survey). (See map, p. 178.)

The cave has many nice formations which are badly vandalized by the locals. Our guide took a burlap bag with him into the cave and proceeded to smash formations to fill his bag. We tried to dissuade him, to no avail.

Octimaxal Sur Numero 2

(No. 18 on the Zacapoxtla-Cuetzalan Area Map)

The cave entrance is located in the sink immediately adjacent to the quarry and behind Rafael Arellano's house.

The entrance drops are climbable or bypassable. Rick Rigg sketch-mapped about 500 ft of passage going downstream through some fairly tight passages. The locals say the cave goes many kilometers and doesn't end, although it seems improbable that they could or would have explored it. Their description seems accurate as far as it was explored. If the accuracy continues there is a 7 m drop past where Rick stopped.

Grutas de Atepolihuit

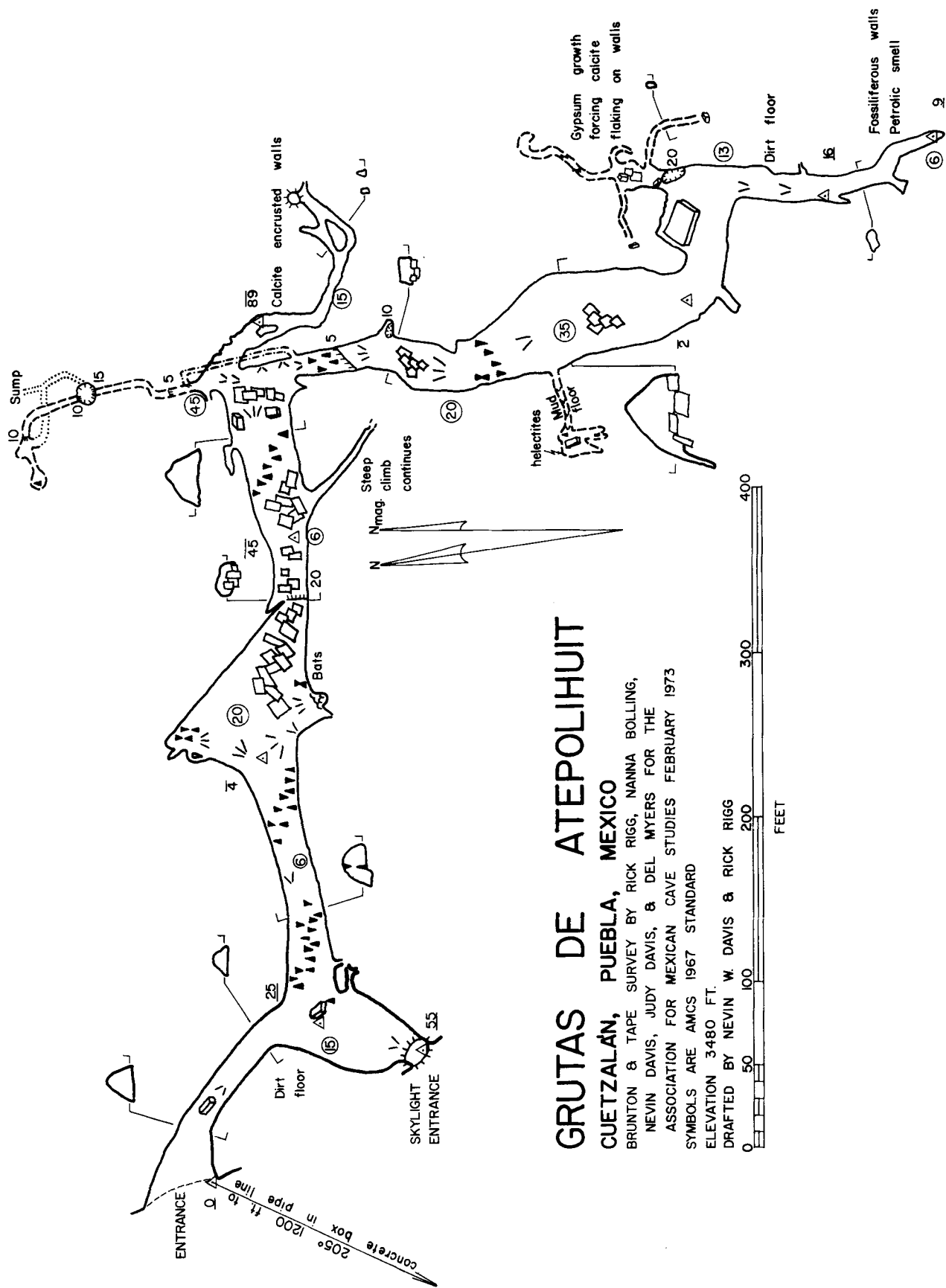
(No. 19 on the Zacapoxtla-Cuetzalan Area Map)

To locate this cave start on the curve above Octimaxal Sur Numero 1 and walk 100 ft on the road toward Cuetzalan. Take the path on the left 50 ft to a gate in the fence. Proceed through the gate into the pasture, paralleling a fence on the left. Turn left through a gate in this fence. Follow the foot path along the side of the hill on the right to where it enters a grove of coffee trees. The path goes steeply downward in a series of switchbacks to the foot of a 40 ft high waterfall. Cross the stream at the foot of the waterfall and continue northward down the large valley. There is a noticeable cliff to the east. Walk down the cleared valley to a cone-shaped hill below the cliff. In 1973 a pipeline was built down the valley. The cave is at the base of the cliff 1200 ft at a bearing of 25° from a prominent concrete junction in the pipes. The cave is about 1/2 hour walk from the highway and 660 ft below it.

The entrance (elevation 3490 ft) in nearly horizontal limestone is 35 ft high and wide. The passage from here goes 200 ft to a second entrance inaccessible from outside the cave. The room at this juncture is 50 by 100 ft and 15 ft high. From here the passage leads into the mountain. The cave is characterized by large piles of breakdown and dead formations. In general the passages are not much higher than 20 ft. The south end of the cave contains an area of fossil beds and a noticeable petrolic smell.

The cave contains 2016 ft of passage (horizontal component), 1336 ft of which were surveyed and 680 ft of which were sketched. Its vertical extent is only 144 ft. (See map, p.180.)

A bit of vandalism at the entrance announces: Luis G. Huidbro 3 km. x 1.67.



GRUTAS DE ATEPOLIHUIT

CUETZALÁN, PUEBLA, MEXICO

BRUNTON & TAPE SURVEY BY RICK RIGG, NANNA BOLLING,

NEVIN DAVIS, JUDY DAVIS, & DEL MYERS FOR THE

ASSOCIATION FOR MEXICAN CAVE STUDIES FEBRUARY 1973

SYMBOLS ARE AMCS 1967 STANDARD

ELEVATION 3480 FT.

DRAFTED BY NEVIN W. DAVIS & RICK RIGG

Sumidero de Atepolihuit
(No. 20 on the Zacapoaxtla-Cuetzalan Area Map)

Follow the instructions for Grutas de Atepolihuit and follow the pipeline down the valley. Ahead at a lower elevation is a tile-roofed animal shelter. Continue on the trail or pipeline past the shelter to the stream. Here you first realize that the stream is following a blind valley. The water sinks at a cave entrance in the prominent cliff on the northeast side of the valley. This entrance was shown to Nevin and Judy Davis in Feb. 1972 but the cave was not entered until 26 Feb. 1973 by Del Myers, Nevin Davis, and Judy Davis. At this time a survey was started. Two more trips were required to produce the map as it now stands. The cave is perhaps 1 hr. from the highway and is almost 1200 ft below it.

The only access to the cave is by wading down the middle of the stream. Jungle overgrowth makes any other route nearly impossible. A collapse of the passage at the entrance resulted in a sheer 40 ft drop from the breakdown into the cave. This can be bypassed only at the right side of the entrance by crossing a log to a ledge and traversing this ledge to the passage floor.

This can be characterized as a huge tunnel whose floor has the nasty habit of descending in steps. The resulting waterfalls are fortunately all climbable without vertical equipment except the one 4348 ft from the entrance which stopped the exploration. Some of the climbs are tricky enough to require a belay for less sure climbers. This fact became apparent when Judy, climbing on belay, slipped and swung completely under a waterfall, however, her carbide lamp remained lit. She found the climbing easier in her new position on the face and soon arrived at the top. Without the rope she would have been swimming in the plunge pool.

Small streams entering here and there along the passage add volume to the main stream. One of these passages was followed for 960 ft at which point it split into two crawlways. A curious thing happens 1743 ft from the entrance. There is a large, high level passage over 45 ft above the stream which curves back into the main passage. This was probably an ancient meander of the original route which has been cut off by the present route, a steep, narrow canyon. From this ancient meander, a side passage departs. Its floor is deep and filled with gypsum spikes over 6 inches long.

Near the beginning of this passage, the walls are covered with angel hair, and further along the passage gypsum flowers abound. This passage continues 420 ft, averaging 6 ft wide and 8 ft high. Exploration was terminated when the passage became a belly crawl upward over gypsum sand.

Where the cave floor is not covered with breakdown, it consists of cemented conglomerate of various colored pebbles. In most places the conglomerate is covered with a uniform black layer, but infrequently where it is polished by the stream it looks much like a multicolored terrazzo floor.

The third trip into the cave was made by Nevin and Judy Davis to push beyond the permanent survey station and to explore all accessible side passages. We arrived at the station after the long descent from the highway and 2/3 mile trek through the cave. Beyond the station, the passage was low and wide with no major obstacles for 780 ft. Here we encountered the first impasse in the cave. The stream plunges down a 6 inch wide gorge. It is possible to traverse to a ledge overlooking a pool into which the gorge waterfall empties. A limited amount of vertical equipment, consisting of a 60 ft long 3/8-inch Goldline and Jumars had been brought along; therefore, I planned to go down to see what happened. However, after tying the rope to the nearest boulder, it was found to be 10 ft short of reaching the water. The only thing it was good for was to plumb the drop. It was 31 ft to the water and the pool was 12 ft deep. This is the furthest penetration of the cave to date. The passage continues as a large upper gallery and

water leaves the pool via another narrow canyon. Air blowing down the passage indicates another entrance, probably in the canyon to the north.

The depth below the entrance at the point of furthest penetration was 442 ft. The horizontal component of the distance to this point is 4348 ft. The total surveyed passage horizontal component amounts to 5194 ft. A total of about 7200 ft of passage was explored. (See map, pl. 3.)

Sumidero de Yohuatichan

(No. 21 on the Zacapoaxtla-Cuetzalan Area Map)

To find the cave walk down the stone road at mile 14.7 on the Apulco-Cuetzalan road log. The stone road continues over the hill above the entrance making it necessary to turn right and follow an aqueduct to where the gigantic entrance is visible. The cave is about a 25 minute hike from the paved road. An interesting departure here—the aqueduct is constructed through a now-collapsed cave in order to penetrate one of the small hills nearby.

The 230 ft wide by 100 ft high entrance harbors lush tropical vegetation including flowering plants hanging from cracks in the cliff. To the right above the stream is a large flat dirt area with a trail leading to it from the stream. (See photograph, below, p. 183.)



The entrance to Sumidero de Yoahuatichan is visible from the highway. This is a telephoto view (Nevin Davis).

In dry weather the water disappears just inside the entrance. However, in wet weather the stream rises at least 17 ft at the entrance submerging the innermost reaches of the cave under more than 100 ft of water. There is washed-in vegetable matter in the highest parts of the cave. In places logs are jammed in the ceiling, and passage constrictions have sticks and other vegetable matter wedged into them. In places the floors are swept clear of fill exposing a smooth bedrock floor. Scallop markings, where visible, vary from 1/2 inch wide at the floor to 3 inches wide near the ceilings, also indicating flooding.

The huge entrance passage soon degenerates into a remarkable maze of arched, triangular passages and cylindrical tubes which seem to be conduits carrying water to a saturated zone. At the rear of the cave a waterworn drop leads to a deep stagnant pool and the end of exploration.

On the northwest side of the passage near the entrance are two side passages to low mazes which were incompletely explored. This area contains over 600 ft of passage which should be further investigated. Over 4500 ft of passage were explored, 3921 ft of which is shown on the map. (See map, pl. 4.)



A view from the dirt platform inside the entrance to Sumidero de Yohuatichan. Notice the person standing in the stream bed (Nevin Davis).

SUMMARY

To date we have explored 21 caves containing 44, 933 ft. (8.5 mi.) of passage and have mapped 23,501 ft. (4.4 mi.). The longest and deepest of these is Sumidero de Atepolihuit which is 442 ft deep to where exploration stopped. No large sôtanos have been discovered and the deepest shaft found to date is the 108 ft pit entrance to Grutas de Tenextepec.

Only the more accessible caves have been found. In the areas so far investigated 82% of the cave passage lies between 2500 ft and 4200 ft elevation.

The summary figures listed above do not include any of the caves listed in the following supplement (cave nos. 22-31), although they are listed below.

Cave Name	Length of Passage Explored	Length of Passage Mapped	Elev.
1. Grutas Karmidas	650 ft		2400 ft*
2. Lracauch	660+		1800*
3. Spring	50+		
4. Xochitl	3300		4500*
5. Cave 0.6 mi	200		5140
6. Cueva Escalera	900		4100*
7. Cueva de la Milpa	120		4100*
8. Cuevacita Ekimita	250+		4000*
(Nearby Cave)	200+		4000*
9. Grutas de Tenextepec	7000+	6300 ft	4000*
10. Cueva Muchacho	400+		4200*
11. Grutas de Poncho Sierra	1500+		3870
12. Sumidero de Jonotla	2900+	2593	3600*
13. Grutas de Jonotla	700		3700*
14. Grutas de Cuexalocstoc	1700		3030
15. Xiliapa	5800+		3700*
16. Cueva de Xocoyolo	3098	3098	5100
Cueva Murciélago de Xocoyolo	300+		5100
17. Octimaxal Sur n. 1	1159	1059	4100
18. Octimaxal Sur n. 2	500+		4150
19. Grutas de Atepolihuit	2016	1336	3490
20. Sumidero de Atepolihuit	7200+	5194	3000
21. Sumidero de Yohuatichan	4500+	3921	3680
22. Grutas de Ateno	3000+	2727	2270*
23. Cueva de los Camarones	300+		2270*
24. Sumidero de Cuetzal Temanes	800+		2930*
25. Cueva de la Vibora	60		3000*
26. Sima Esteban	3180+	1842	
27. Cueva de Olivares	525		
28. Cueva de la Barranca	225+		
29. Cueva de Guayateno	600+		
30. Cueva Chilita	300+		
31. Sumidero de Cuacteno	200+		
+ Passage continues			*Approximate elevation

SUPPLEMENT

Edited by James R. Reddell

Introduction

A group of five cavers from Texas (William Elliott, Bob Harr, Roy Jameson, David McKenzie, and James Reddell) during the week of December 24-31 visited the Zacapoaxtla-Cuetzalan Area primarily for the purpose of making biological collections in some of the caves described by Nevin Davis in his report. The extension of the road from Xochitlán towards San Bernardo and the new road to Santa Lucia led inadvertently to the discovery of the new caves described in this supplement. One of the larger (Grutas de Ateno) was mapped and a map of another (Sima Esteban) begun. Sketch maps of three other caves are included also. A road log of the road to Santa Lucia is included below, and a new log of the Xochitlán road was made and is inserted into the body of the text above. One cave reported but not explored by Davis (No. 7 on the Area Map) was explored and given the name, Cueva de la Milpa. It is described below. Numerous collections in the area were made and prove to be of great interest, but our knowledge of the biology of the caves of the area remains scanty at best. The new caves explored are included on the Area Map and are listed below the listing of caves by Davis in his summary.

It is perhaps not inappropriate here to urge anyone who wishes to continue the work of Nevin Davis in this area to contact him about their intentions. This is only common courtesy, since he and his companions intend to continue their exploration and mapping in this remarkable area.

Cueva de la Milpa

(No. 7 on the Zacapoaxtla-Cuetzalan Area Map)

A shallow sink in a cornfield about 50 m from the road leads down a steep muddy slope to a junction of 2 fissures. One straight ahead ends after 5 m. The other continues as a 10 m high, 1 m wide passage for 30 m before continuing above an 8 m drop into the fissure. A skylight leads 12 m to the surface midway along the passage. The cave is cold and offers no promise. Total explored passage was about 40 m.

ADDITIONAL CAVES IN THE VICINITY OF XOCHITLAN

Grutas de Ateno

(No. 22 on the Zacapoaxtla-Cuetzalan Area Map)

The principal entrance to Grutas de Ateno is located at one side of a large shelter. A pool is to be found along the passage and is floored with deep mud. This may be avoided by clinging to the right wall. Beyond the pool the cave continues up over many small dry travertine dams. After 25 m a small passage to the left extends for 150 m before ending. It is dry and floored

with small breakdown and rocks. Beyond this passage the cave continues to a major intersection. To the right a wide low passage leads over great mounds of sand down and then up into a large shelter-like entrance room containing a few formations. To the left the main passage continues over travertine dams for 100 m into a large high room containing pools and some flowstone. To the right from this room passages lead steeply down to a deep pool. To the left a low passage leads to a climbable fissure down into a steeply-sloping passage which terminates in a roaring stream which leaves a deep lake, rushes down rapids and disappears immediately into a siphon. A total of 909 m of passage was surveyed and an additional 100 m of small side passages sketched. No prominent leads were left unchecked. (See map, pl. 5.)

Grutas de Ateno is obviously an older primary spring exit now used only as an overflow route during flood time. Dencutting of the surface river has led to the cave stream now utilizing a lower level passage.

Cueva de los Camarones

(No. 23 on the Zacapoaxtla-Cuetzalan Area Map)

This cave is located at the head of and about 15 m above the floor of a short canyon across the river and slightly upstream from Grutas de Ateno. From below it appears to be a wide shelter but closer inspection reveals two passages leading out from the shelter. One on the left is a small hole in breakdown which extends as a 35 m crawlway, ending in breakdown. The main passage, however, is a 7 m wide, 1.5-2.0 m high passage floored with a few inches of water. This pond is formed by the breakdown in the shelter and is fed by a small stream. The water seeps through the breakdown to emerge below the cave entrance as a seep. The wide ponded area is about 15 m long, at which point it opens into a 2-3 m high, dry passage with the stream meandering across the floor. After 15 m the passage becomes a 1 m high, 1.5 m wide crawl along a stream passage. This was explored for 30 m and continues beyond this point with the same dimensions. The cave apparently has no local name so it was named for the large population of crayfish inhabiting the ponded area.

Sumidero de Cuetzal Temanes

(No. 24 on the Zacapoaxtla-Cuetzalan Area Map)

A small stream cuts across a heavily-silted karst valley, gradually deepens into a deep arroyo containing at least one unclimbable waterfall, and finally ends in a blind canyon containing a short drop into a 15-20 m high, 8-10 m wide canyon passage. It is possible to enter the arroyo by a trail on the right immediately before the entrance into the cave. The cave contains numerous pools, some with eyed fish, and was explored for 260 m to a 10-15 m drop into water. The cave is several hundred meters above the nearby river valley and is extremely promising.

There is a large sink to the right of the trail to the cave and immediately before the end of the arroyo. This sink leads into a short, very muddy cave. Others sinks in the area were not checked.

Cueva de la Vibora

(No. 25 on the Zacapoaxtla-Cuetzalan Area Map)

Cueva de la Vibora is a small climbable 16 m deep sink to the right of the road to Grutas de Ateno. It drops into a single room containing less than 20 m of passage. A few other sinks near Cueva de la Vibora were checked but found to be silt-filled.

ROAD LOG TO SANTA LUCIA

Total Miles	Partial Miles	
0.0		Dirt road to left to Santa Lucia
0.8	0.8	Road to left to pit entrance to Sima Esteban (No. 26). Large dolina entrance to Sima Esteban on right below road.
1.1	0.3	Dolina (good campsite) on left. Trail to right leads to complex set of trails, some of which re-enter the road above and below the campsite. These trails lead through an extensive karst area containing numerous caves, including Cueva de Olivares, Cueva de la Barranca, Cueva Chilita, Cueva de Guayateno, and Sumidero de Cuauhteno (Nos. 27-31).
(2.5)	(1.4)	Santa Lucia. Road is under construction from the dolina campsite to the village.

Sima Esteban

(No. 26 on the Zacapoaxtla-Cuetzalan Area Map)

The main entrance to Sima Esteban is at the bottom of a large dolina to the right and about 75 m below the road to Santa Lucia. A trail leads down from the road, along the edge of a cornfield and then winds down into the stream channel. From here it is possible to follow the stream down the the 25 m wide, 5-10 m high cave entrance. A climb down over large moss-covered boulders leads into a 5-10 m wide passage containing the meandering and largely avoidable stream. About 150 m from the entrance a small stream cascades from a 2-3 m wide, 3-5 m high fissure-like passage to the left. This rapidly ascending passage enlarges and continues for 130 m to the bottom of a vertical entrance. This entrance is in a dolina and is reached by a steep slope to the top of a 12 m drop into the cave. Beyond this entrance the cave stream may be followed for only about 10 m before it emerges from a breakdown choke. Below the junction of the two passages a steep, precipitous slope leads to a waterfall which empties into a very deep plunge pool. With care in rigging this drop the falls and pool can be avoided. Beyond the waterfall the cave continues for 300 m to a junction. The right-hand passage was explored for 60 m, while the main stream passage continues for 300 m as a 10-15 m wide stream passage, at which point exploration ceased. The cave's stream probably exits through Cueva de Guayateno. The total surveyed length is 614 m and the explored length is about 1060 m. (See map, pl. 6.) Sima Esteban is obviously a major system and should prove to be quite extensive.

Upstream from the main entrance along the west wall of the canyon are several small largely unexplored caves, at least one of which contains a small stream.

Cueva de Olivares

(No. 27 on the Zacapoaxtla-Cuetzalan Area Map)

A small stream leaves the 5 m wide, 3 m high entrance to Cueva de Olivares and eventually empties into Sumidero de Cuacteno. The cave consists of a series of strongly joint-controlled passages, with the stream now following the largest. The stream runs swiftly over small cobbles and is seldom more than a few inches deep. It can be largely avoided until near the end where it emerges from a very low unexplored squeezeway. The cave contains about 175 m of explored passage. It is known locally only as "Las Grutas" so it was named for the man who lives nearest to it and who guided us to the entrance. (See map, p. 189.)

Cueva de la Barranca

(No. 28 on the Zacapoxtla-Cuetzalan Area Map)

Cueva de la Barranca is a dry cave located on the hillside above the stream which enters Sumidero de Cuacteno. It was partially explored by David McKenzie and consists of a series of joint-controlled passages with about 75 m of explored passage. It probably represents a now dry spring exit.

Cueva de Guayateno

(No. 29 on the Zacapoxtla-Cuetzalan Area Map)

This attractive resurgence cave is probably the outlet for the stream in Sima Esteban, which is located approximately 1 km to its south. The entrance is approached along a narrow, fern-lined canyon where the stream from the cave cascades over a series of step-like terraces and plunge pools. The floor of the stream channel is composed of a rust-red cemented breccia—perhaps the same impermeable layer responsible for the “terrazzo floors” in other caves of the region. The cave passage, initially, is triangular in cross-section, 3.5 x 4 m high, with the stream shallow or easily avoided. After 50 m one passes beneath two 20 m high skylight entrances and thereafter must traverse, with some difficulty, a series of deep potholes. At approximately 200 m from the entrance, the passage widens at the conjunction of several smaller passages, the major joint continuing as a high fissure, less than a meter wide, in the direction of 180° azimuth. The source of the water, however, is a higher, constricted area at the left side of the room. These leads were not pushed. (See sketch map, p. 190.)

The stream that leaves the cave travels no more than 150 m before submerging in a mud-choked drain at the edge of a cornfield. But by traversing the hillside to the SW, for perhaps 75 m, one encounters another entrance at the base of an overhanging cliff. The fissure-like entrance drop, from which issued the sound of running water, was not entered due to the lack of a handline.

By climbing up a narrow, steeply inclined cornfield in a direction SW of the Guayateno canyon, near the entrance, one crosses a saddle and enters a shallower dolina adjacent to a prominent trail to Santa Lucia. Here is a conspicuous cliff and cave entrance at the edge of this basin. A passage segment, 6 x 4 m high and containing a stream was explored for 30 m to an apparent obstruction of breakdown. Several leads were left unchecked.

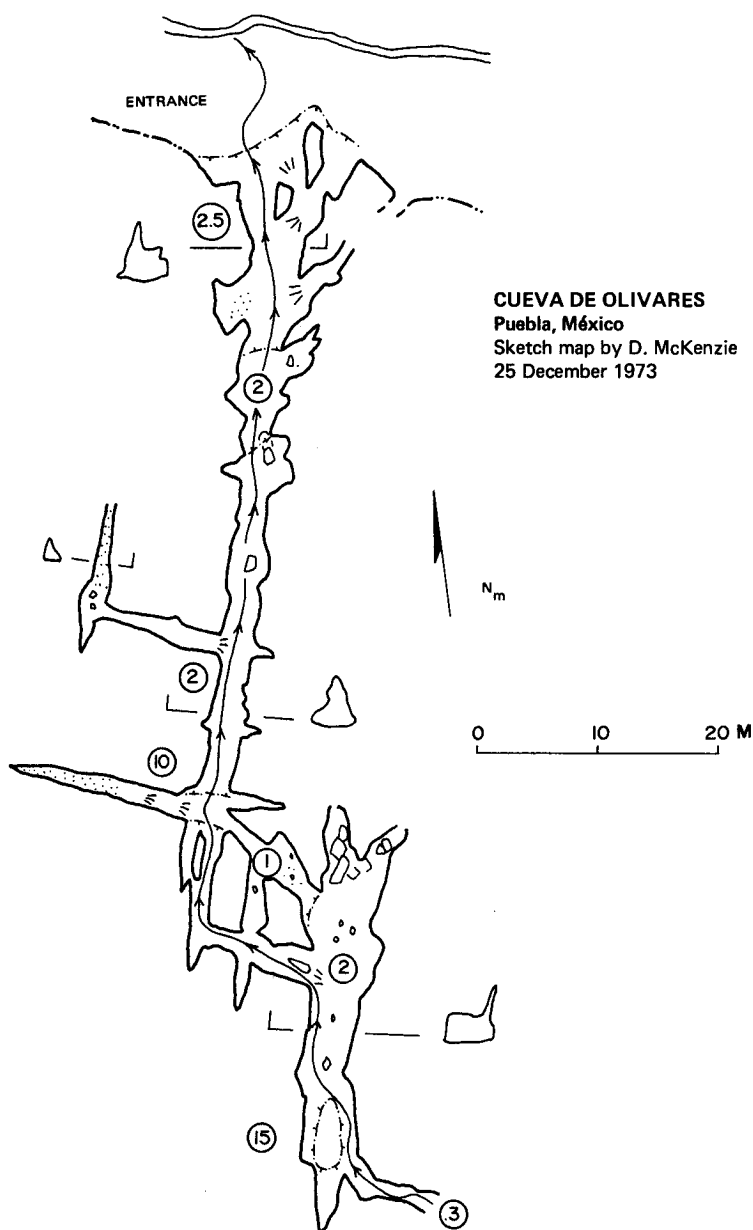
Cueva Chilita

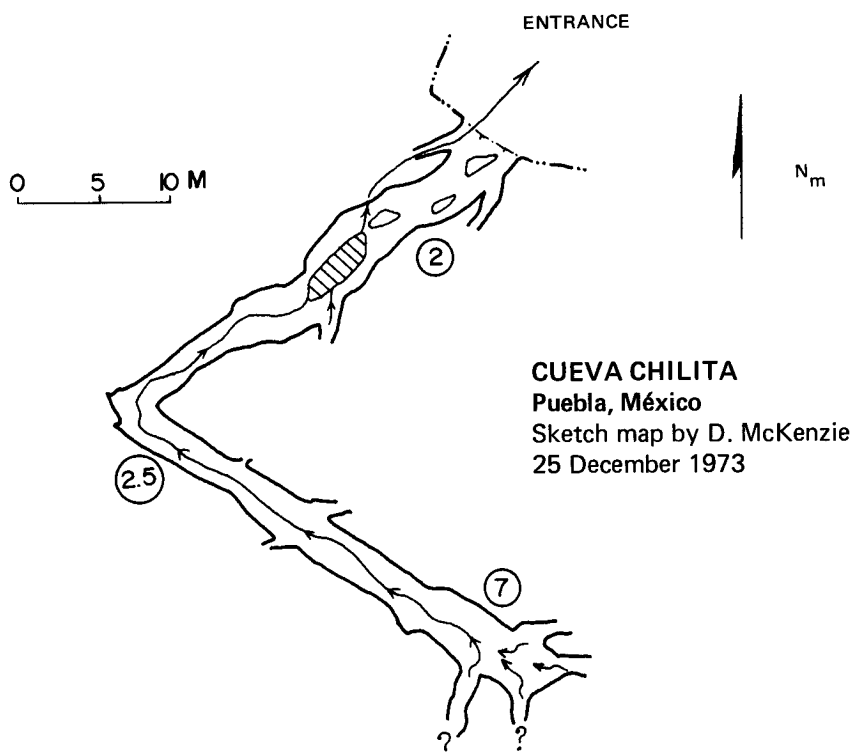
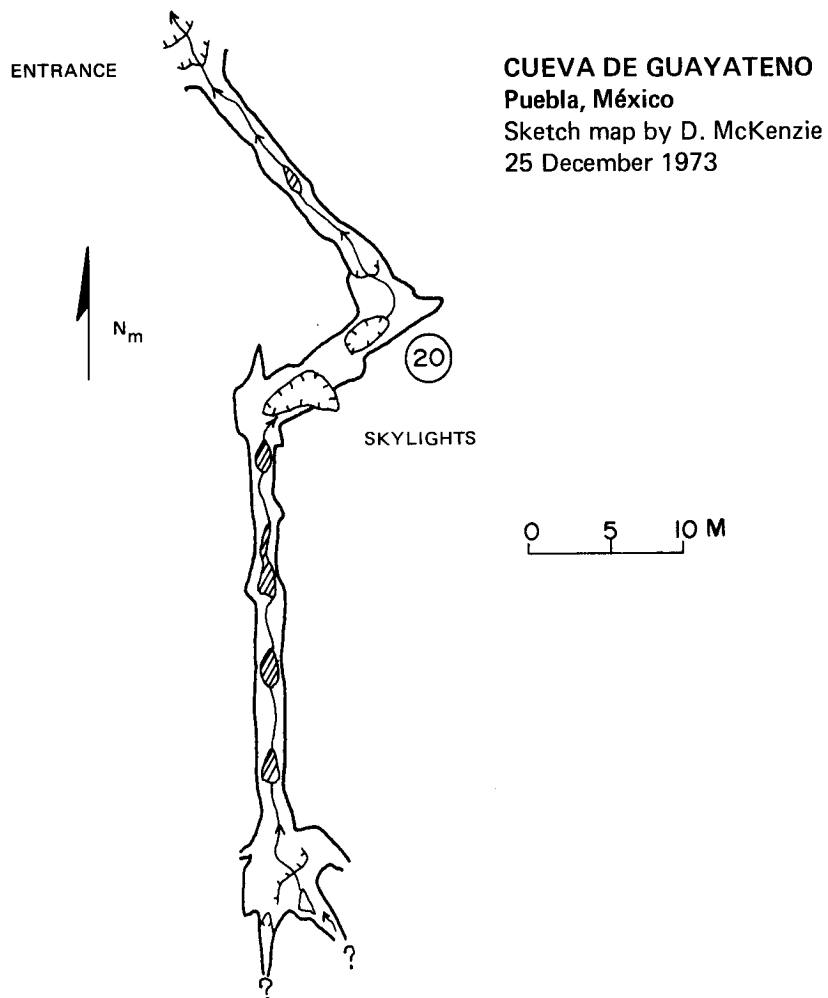
(No. 30 on the Zacapoxtla-Cuetzalan Area Map)

This is a small nacimiento—a tributary to the stream that enters Sumidero de Cuacteno 2 or 3 km farther north. (Locally, the cave is well-known by its name.) The entrance, obscured by vegetation, is at the base of a hill approximately 100 m SW of a small waterfall and footbridge. Like other water caves in the area, it is a complex of walkable passages, strongly joint-controlled, and with several passages containing a portion of the stream. Less than 100 m from the entrance is what appears to be an obstruction of breakdown. Water pours down from a higher area and through several adjacent fissures. A more thorough exploration will be possible when the stream is lower. (See sketch map, p. 190).

Sumidero de Cuaucteno
(No. 31 on the Zacapoaxtla-Cuetzalan Area Map)

The small stream below Santa Lucia is destined for this sumidero 6-8 km to the north. There are several tributaries along its route, including springs at Cueva de Olivares and Cueva de Chilipa. This cave has at least 3 entrances. The stream enters two of these and flows NNW through passages developed along two parallel joints approximately 15 m apart. The third entrance is a sink intersecting the largest passage only shortly within. This passage, 2 x 4 m high and containing rapidly flowing water, continues 60 m to an abrupt turn to the left (west), having collected all the water from the other passages via several cross-joints. The stream then flows 6 m to where it is channeled spectacularly over the lip of a pothole and into a deep lake 8 to 10 m below. This drop probably will be a formidable obstacle even during the driest part of the year.





Index for the Association for Mexican Cave Studies Newsletter, Vol. IV

- Abbingdon, Ivy 120
 Abernathy, Miles 80
 Abernathy, S. de (S.L.P.) 38
 Abernathy, Dr. Francis 7-10, 51, 76
 Abisso Davanzo (Italy) 74
 Abisso Della Genzianella (Italy) 74
 Abra, El, Tamps. 50
 Abra, C. de El (Tamps.) 58, 66, 126, 128
 Abra, Sierra de El, Tamps.-S.L.P. 5, 28, 31, 33, 49, 55, 126
 Abran Cave (Texas, U.S.A.) 56
 Acarina 34, 39
 Actún Xpukil (Yuc.) 95
 Actún Kaua (Yuc.) 95
 Acultzingo, Ver. 20
 Addis, Bob 121
 Addison, Tom 98, 119
Agastoschizomus lucifer 33, 38
Agkistrodon 133
 Agua, C. del (S.L.P.) 32, 37, 47, 87
 Agua de Tlilapan, C. de — see Macinga, C.
 Agua Marga, Rancho, S.L.P. 49
 Aguila, S. de (Qro.) 57
 Aguirre, Armando 68
 Agustín, C. de San (Oax.) 6, 29
 Agustín, S. de San (Oax.) 6, 29, 147
 Ahuacatlán, Qro. 57
 Ahuacatlán, Sotanito de (Qro.) 3, 29, 57
 Alamo Grotto 3, 4, 11, 12
 Albert, Dr. Richard 49, 79
 Albert, Tom 49, 60, 62
 Alexander, Ed 52
 Altes Cumbres no. 1 y no. 2, S. de (Tamps.) 56
 American Philosophical Society 49
Amphiacusta 35
 Amphipoda 32
Anargyrtes 35, 40
Ankylocythere tolteca 37
Antroforceps bolivari 35, 41
Aphonopelma stygia 33, 38
Aphrastochthonius 33
Aphrastochthonius parvus 33, 37
Aphrastochthonius russelli 33, 37
 Apoala, Oax. 91
 Aquismón, S.L.P. 6, 28, 47, 80, 112
 Araneae 33, 38
 Arboles, S. de los (Oax.) 91
 archeology 105, 113, 118, 124, 126-128
 Arco, C. del (S.L.P.) 141
 Arcotete, C. de (Chis.) 38, 39, 68
 Arellano, Rafael 177, 179
 Argano, Roberto 93
 Arriba del Río Iglesia, C. (Oax.) 40
 Arroyo, S. del (S.L.P.) 3, 5, 6, 17, 23, 26, 28, 34, 40, 127, 132
Artibeus jamaicensis 51
Asellus 63
 Ashworth, A. C. 104
 Asnes, Pat 62, 116
Astyanax 36
 Atchalpa, Ver. 21
 Ateno, Gs. de (Pue.) 162, 184, 185-186, plate 5(map)
 Atepolihuit, Gs. de (Pue.) 179, 180(map), 184
 Atepolihuit, Su. de (Pue.) 155, 181-182, 184, plate 1(map)
 Atoyac, Ver. 20
 Atoyac, Gs. de (Ver.) 20, 33, 37, 38, 39, 67
 Ayutla, Qro. 52, 56-57
 Backer, David 117
 Balankanche, Gs. de (Yuc.) 61, 120
 Balcón del Diablo, La C. del (Ver.) 19
 Bärenschacht (Switzerland) 74
 Barillet, M. 12
 Barr, Dr. T.C. 12
 Barranca, C. de la (Pue.) 184, 187, 188
 Barranca, S. del Rancho de la (S.L.P.) 87, 132
 Barro, Rancho, Qro. 56, 57, 59
 Barton, Ann 79
 bats 19, 20, 51, 77, 80, 133-134
 Bauman, Bill 121
 Becket, Joan 97
 Bee Cave (S. de Abejas) (Tamps.) 40, 50, 77
 beetles, cave 35, 36, 51, 52, 63-70, 77, 146
 Benalcázar, Victor H. 59, 123
 Benfer, Bob 15
 Bequaert, Dr. J. C. 141
 biology, Mexican cave 31-36, 46, 63-70, 75, 104, 129-134
 Binney, Frank 60
 Bittinger, Craig 57; 59, 60, 62, 116-117, 120, 134, 139
 Bittinger, Dr. Stanley 58, 59
 Bittinger, Steve 58, 59, 60, 62
 Blom, Trudy 68
 Boca, C. de La (N.L.) 38, 39, 63, 64, 112
 Bocate, Rancho, S.L.P. 47
 Boles, Brian 60
 Bolívar, Candido 31
Bolivaresmus monasticus 40
 Bolling, Nanna 154
 Bomba, C. de la — see Agua, C. del
 Bonet, Dr. Federico 26, 27, 31, 87

- Bonetesmus novenus* 40
 Bonilla, Alfredo 153
 Bonita, C. (Tamps.) 39
 Bonner, Paul 122
 Boon, Mike 97, 104
 Booth, Richard 61
Bothrops atrox 132
 Bouillier, N. 55
 Branson, Ken 57, 58
 Brantley, David 119
 Breder, Charles 31
 Brezno Pod Gramsovo Glavico (Yougoslavia) 74
 Brignoli, Marcello 104
 Bridgemon, Ron 141
 Broadus, Jerry 47, 78
 Brooks, Roy 124
 Broussard, Don 63, 122, 126, 127
 Brownfield, Mel 79
 Brujo, C. de (Oax.) 90
 Buca Grande di Monte Pelato (Italy) 74
 Buque, S. del (Qro.) 3, 6, 29, 52
 Burgos, Felix 64
 Bustamante, N.L. 3, 4, 6, 13, 55, 115
 Bustamante Project 16
 Butterwick, Mary 92

 Caballos, C. de los (S.L.P.) 52
 Cacahuamilps, Gro. 6, 29, 32
 Cacahuamilps, Gs. de (Gro.) 56, 70, 129, 148
 Calderón, Luis 89
 Calvert, Bill 47
 Camarones, C. de los (Pue.) 162, 184, 185
 Cambou de Liard (France) 74
 Camino, C. Chica del (Chis.) 38
 Camino, Su. del (Chis.) 39
 Campo Chico, Rancho, Oax. 88
 Camposantos, S. de (Qro.) 40
 Cañón de Fraile, C. del (Tamps.) 56
 Cantú, Jr., Amador 75, 101-102, 114, 116, 139-140
 Capilla, C. de la (Tamps.) 33, 37, 38, 39, 40, 66, 77, 79, 80, 82(map), 147
 Caracol, Rancho, Oax. 88
 Carnicerías, C. de (S.L.P.) 39
 Carpenter, Jim 12
 Carrizal, C. del (N.L.) 6, 28, 33, 37, 38, 124
 Carta Luña, C. de (Ver.) 88
 Carter, Dr. D. C. 27
 Casar, Alejandrina Pérez 148
 Cascada, C. de la (Ver.) 39
 Castro, Eduardo 120
 Catfish, blind 89

 Causey, N. B. 34
 Cebolla, Su. de la (N.L.) 118
 Ceiba, C. La (S.L.P.) 49
 Cellagua, Su. de (Spain) 74
 Cenote
 Aká Chen (Yuc.) 95
 Cenote's Bar (Yuc.) 62
 Chancanab (Yuc.) 62
 Chichén Itzá (Yuc.) 61
 in Parque Nacional (Chis.) 68
 Sagrado (Yuc.) 61
 Xtojil (Yuc.) 62
 Xtoloc (Yuc.) 61
 Zaci (Yuc.) 62
 Cepeda, Joe 50, 78
 Cerámica, C. (S.L.P.) 127
 Cerca, C. de la (S.L.P.) 60
Ceres nelsoni 141
 Cerro Hueco, C. (Chis.) 38, 144-145
 Chabert, C. 55
 Chabert, Jacques 56
 Chamal, Tamps. 77
 Chen-Sin-Vil-Mut (Chis.) 29
 Chelonethida 33, 37
 Chevrón Cave (Qro.) 67
 Chica, C. (S.L.P.) 39, 67, 76, 78, 129
 Chica de la Perra, C. (Tamps.) 66, 80
 Chicuazen, Chis. 22
Chidoscolus multilobus 130
 Chilipa, C. de (Pue.) 189
 Chilita, C. (Pue.) 184, 187, 188, 190 (map)
 Chivostoc, C. (Pue.) 157
 Chontalcoatlán, C. de Río (Gro.) 20
 Chorreadero, C. de El (Chis.) 29, 144
 Chorros de Agua, C. de (N.L.) 38, 63, 64, 96
 Chourum des Aiguilles (France) 74
Cicurina 33
Cicurina coahuila 33, 38
Cicurina iviei 38
Cicurina mina 33, 38
 Cielo, Rancho del, Tamps. 64, 76, 77-79
 Cinquenta y Ocho, S.L.P. 52
 Cinquenta y Ocho, C. de (S.L.P.) 52
 Clavo, Rancho, Qro. 47, 48
 Clements, Jim 60, 102, 114, 116
 Coatimundis, S. de los (S.L.P.) 57, 58, 60
 Coche, C. de la (Izabal, Guat.) 69
 Coconá, Gs. de (Tab.) 29, 37, 96
 Coleoptera 35, 36, 41
 Collembola 35
 Collins, Mike y Lynn 78

- Combes, Bill 121
 Comedor del Diablo, S. El, (Oax.) 91
 Comitán, Chis. 29
 Conca, Qro. 59
 Conner, Mary 124
 Connolly, Mike 115-116, 118-119
 Conrado, S. de (Qro.) 59
 Constantín, C. de (N.L.) 28
 Constantine, Denny G. 133
 Cook, Bart 78
 Cooke, Jerry 79
 Córdoba, Ver. 22, 25
Coryssocnemis abernathyi 38
Coryssocnemis clarus 38
Coryssocnemis facetus 38
Coryssocnemis iviei 38
Coryssocnemis pecki 38
Coryssocnemis placidus 38
 Costa Rica 46
 Couderc, T. 55
 Courbon, Paul 74, 120
 Coyote, C. del (Chis.) 68
 crayfish, blind 32, 37, 89, 90
 crickets
 cave 20, 31, 35, 52, 77
 camel 35
Crotalus atrox 132
Crotalus terrificus 132
 Cruz, Genaro 127
Cryptocellus bolivari 34, 39
Cryptocellus mitchelli 34, 39
Cryptocellus osorioi 34
Cryptocellus pelaezi 34
Cryptocellus reddelli 34, 39, 53
 Crystal Cave (Tamps.) 66, 79, 83 (map)
Ctenus 79, 131
Ctenus mitchelli 38, 131
 Cuacteno, Su. de — see Cuacteno, Su. de
 Cuarteles, C. de los (Tamps.) 87
 Cuatro Ciénegas, Coah. 32, 53
 Cuacteno, Su. de (Pue.) 184, 187, 188, 189
 Cucharas, Sierra de — see also Abra, Sierra de El 50
 Cuddington, Bill 25
 Cuddy, Buck 25
 Cudista, S. (Qro.) 59
 Cuesta, S. de la (S.L.P.) 60, 120
 Cuetzal Temanes, Su. de (Pue.) 162, 184, 186
 Cuetzala, C. de (Gro.) 129
 Cuetzalan, Pue. 153
 Cuevacillas, C. de (Coah.) 38
 Cuexalocstoc, Gs. de (Pue.) 152 (photo), 169, 171-172, 184
Cyathura 68
Cyathura sbordonii 68
Cylindroniscus vallesensis 32, 37
Cyrtotoma mexicanum 141
 Davies, John 119
 Davis, Judy 181
 Davis, Nevin W. 152-184, 185
 Davis, Tim 121
 Dawson, Glenda 102, 114, 116
 Debois, Mark 141
 Decapoda 32, 37
 Della Croce, Phyllis 50
 Denson, Debora 96
 Descubridora, Rancho, Dgo. 53
Desmodus rotundus murinus 133
 Diablo, C. del (Chih.) 39, 53
 Diablo, C. del (N.L.) 129
 Diablo, C. del (Ver.) 95
Dimarcus villalobosi 32, 37
 Diplopoda 34, 40
 Doctor Arroyo, N. L. 28
 Donavan, John 97
 Doyl, Dennis 12
 Doyl, M. D. 11-12, 15
 Dressler, B. 55
 Dry Cave (Tamps.) 40
Dugesia 32
 Duncan, Paul 60, 102, 114, 116
 Dallas-Ft. Worth Grotto 15
 Darilek, Glenn 55, 104
 earthworms, troglobitic 31, 32
 Edwards, Charles 8-10
 Ekimita, Cuevacita (Pue.) 153, 164, 165-166, 184
 Elliott, Wm. (Bill) 34, 50-52, 52, 63, 79-80, 104, 112, 185
 El Sótano del Rancho Barro (Qro.) 6, 29, 56-57, 112, 121
 Emilia, C. de (Qro.) 147
 Empalme, C. del (Coah.) 54
Eodrilus 32, 67
Eodrilus albus 37
Eodrilus mexicanus 37
 Escalera, C. (Pue.) 164, 165, 184
 Escondida, C. (N.L.) 118
 Esperanza, Rancho, Qro. 47
 Espinazo, N. L. 28
 Esteban, Sima (Pue.) 184, 185, 186, 188, plate 6 (map)
 Estrella, S. de la (S.L.P.) 60, 121

- Euagrus cavernicola* 33, 38
Eucalodium speciosum 141
Euglandina 141
 Evans, Thomas R. 4, 5, 18-22, 23-26
 Everton, Joe 122
Exochodrilus 35
Exochodrilus caelestis 40
Exochodrilus forcipatus 40
- Faith, Duane 51
 Fantasmas, Valle de los, S. L. P. 29, 35
 Farrar, Mat and Susie 55
 Felton Project 16
 Fern Cave (Texas, U.S.A.) 36
 Fieseler, Ronnie 60, 87, 120
 Fieseler, Susan 120
 Fin, S. el (S. L. P.) 48
 fish, blind 5, 17, 31, 36, 49, 76, 114
 Fish, John 52, 68, 121, 126
 flatworms, cave 32
 Fleming, Steve 55, 101
 Florida, La, Qro. 59
 Florida, C. de la (Tamps.) 33, 34, 37, 79, 96
 Forsythe, Preston 59, 124
 Foster, David 122
 Fowler, Suzanne - see Wiley, Suzanne
 Fraile, C. de (Tamps.) 56
 Frank, Bud 15
 Frio Bat Cave (Texas, U.S.A.) 133
 Fromén, Charles 100, 116, 118
 Fromén, Susey 118
 Galeana, N. L. 28
 Garcia, Edna 102, 114
 García, Gs. de - see Villa de García, Gs. de
 Garza, Ernie 60
 Gates, G. E. 105
Gaucelmus calidus 38
 Gavilán, Pozo de (N.L.) 28, 54-55, 58
 Gay, C. T. E. 105
 George, John 77
 German, Susan 124
 Ghar Parau (Iran) 74
Gibberdesmus egenus 40
Gibberdesmus gelidus 40
Glomeroides caecus 34, 40
Glomeroides promiscus 34, 40
 Gobernador, S. del (Qro.) 38
 Golondrinas, S. de las (S.L.P.) 6, 28, 46, 47, 57, 80, 120, 123
 Gómez Farías, Tamps. 28, 36, 49, 50, 78
 Gómez Farías, S. de (Tamps.) 33, 37, 40
- González, Eraclio 80
 González, Judge Gregorio 56
 González, Guadalupe 56, 57
 Goodbar, Jim 120
 Goodnight, C. J. 34
 Gordon, Jim 56
 Gouffre d'Aphanice (France) 74
 Grande, C. (S.L.P.) 127
 Graves, John 55, 100
 Greer, John 59, 113, 126-128
 Grove, D. C. 105
 Grupo de Investigación Espeleológica 109
 Grupo Espeleológico Mexicano 29, 56, 62, 173
 gryllid 35
 Guadalupe, S. de (S.L.P.) 80, 132
 Guaguas, Hoya de (S.L.P.) 28
 Guano, C. del (Dgo.) 34, 39, 54, 89, 129
 Guayabo, C. del (Oax.) 90
 Guayateno, C. de (Pue.) 184, 187, 188, 190 (map)
 Guilotla, Qro. 57
 Gurnee, Russell 63, 68, 145
- Hart, Jack 56
 Harter, Russell 139
 Haydon, Eugene 50
 Hayes, Tom 7
Helicina turbinata 141
 Hernandez, Carlos 97
 Heuss, Keith 101
 Higareda, Salvador 153
 Higuerón, Hoya de (S.L.P.) 127, 128
 Hirsch, Alice 15
Histoplasma capsulatum 54, 129-130, 141, 149
 Hoctun Cave (Yuc.) 40
 Hölloch (Switzerland) 74
 Holt, P. C. 105
Homo sapiens 134
 Honea, David 51, 90
Hoplobunus inops 34, 39
Hoplobunus robustus 34, 39
 Hormigas, C. de las (Qro.) 47
 Horn, Bill 56
 Howden, H. F. 105
 Howell, Fred 78
 Hoya, C. de la (S.L.P.) 40
 Huautla Region -- see Huautla, Oax.
 Huahuaxtla, Pue. 157, 158
 Huautla, Oax. 6, 27, 29, 32, 87
 Hubbell, T. H. 35
 Huehuetenango, Guat. 146
 Huffman, Jack 12

- Huistán, Chis. 29
 Huitzmolotitla, El, S. de (S.L.P.) 4, 5, 6, 7-10, 25, 26, 28, 40
 Hunter, Mr. and Mrs. John 76, 77
 Hutchings, Dave 120, 122
 Hutto's Swallow Cave (Texas, U.S.A.) 56
 Huxley House, The 52

 Ibarra, Jorge 153, 173
 Iglesia, S. de Río (Oax.) 6, 29
 Illusive Pit (Coah.) 134, 135 (map), 147
 Indios, C. de los (S.L.P.) 127
 Infiernillo, C. de El (Tamps.) 76
 Infinity Pit (Ver.) 25
 International Commission for Arid and Semiarid Land Studies (ICASALS) 49
 Iron Mine (Qro.) 38
 Isenhard, Kyle 121
 Isopoda 32, 37
 isopods, blind 26, 31, 32, 68, 76, 89
 Ixtmatlahua, Sr. Ermiliana 26

 Jalpan, Qro. 6, 29, 35
 Jameson, Roy 59, 112, 185
 Japonés, S. de (S.L.P.) 28, 49, 127
 Jasek, James 122
 Jerónimo, C. de Río San 3
 Jobo, C. de El (S.L.P.) 38, 87
 Johnson, Kenneth 8
 Johnson, Paul 60
 Johnson, Stark 8
 Jonotla, Gs. de (Pue.) 153, 164, 171, 184
 Jonotla, Su. de (Pue.) 164, 169, 172, 184, plate 3 (map)
 Jordan, Jay 59, 124
 Jordan, M. D., Jr. 12
 Juan Amaro, C. de (N.L.) 136, 137 (photos), 138 (map)
 Juan Flores, C. de (Petén, Guatemala) 141, 142 (map)
 Jumar ascender 6
 Junta, C. de La (Oax.) 88, 89
 Junta, C. Chica de la (Oax.) 89
 Juxtlahuaca, Gs. de (Gro.) 29, 33, 39, 62, 109, 132

 Kane, Cindy 120, 122
 Karmidas, Gs. (Pue.) 153, 158, 159, 160 (area map), 161 (photos), 163 (photos), 184
Karos depressus 39
Karos graciosus 39
Karos parvus 39
Karos projectus 39

Karos rugosus 39
 Kastning, Ernst 115
 Kawakatsu, Masaharu 32, 79, 96, 147
 Kef Toghobeit (Morroco) 74
 Kennedy, Chuck 119
 Kern, David 59
 Kern, Kirt 59
 Killian, Montey 12
 Klempke, Debbie and Wayne 116
 Knox, Anne 56
 Knox, Orion 17
 Koester, Denis 63
 Kopel, Ron 124
 Kreekmore, Karen and Ken 116
 Kromsky, Sr. 68
 Kunath, Carl 52

 La Cienega, Qro. 27, 29
 Ladrones, C. de las (Oax.) 90
 Lagos, C. de los (Coah.) 33, 38
 Laguna, C. de la (S.L.P.) 52, 96
 Lagunita, C. de la (S.L.P.) 35, 40
 Laja, C. de la – see Agua, C. del
 Lamar State College of Technology, Beaumont 8
 Landrin, B. 55
 Lanquín, C. de (Alta Verapaz, Guatemala) 70
Latrodectus mactans 131
 Laurens, Jane 122
 Laurens, Mimi 122
 León, S. del (Tamps.) 39
 Lepallier, P. 55
Leptargyrtes 35
Leptargyrtes boneti 40
Leptargyrtes tejamanilae 40
Leucohya magnifica 33, 37
 Lewis, Hoad 12
 Lewis, Jan 53, 61, 80
 Lieberz, Joe 121
 Lillie, Clark 59
 Linja, Rancho, S.L.P. 47
 Littlefield, Bob 15
 Lobos, S. de Los (S.L.P.) 29
 Lobos, S. de Puerto de los (S.L.P.) 51
 Loltún, C. de (Yuc.) 62, 120
 Loma del Carmen, C. de (Oax.) 89
 Long, Dr. Russell 8
 López, Hermino Ramirez 153, 163
 Lord, Peter 97, 120
 Los Sabinos, (S.L.P.) 17, 23, 26
 Los Sabinos, La C. de (S.L.P.) 17, 28, 126
 Lovelace, Donna 50

- Lower Cave (Ver.) 95
 Lowery, Dino 120, 122
Loxosceles 131
Loxosceles reclusa 131
 Lracauch Cave (Pue.) 153, 159-160, 184
 Lucas, Ann 62, 80, 90
 Luz, C. de la (S.L.P.) 34, 40
 Lynn, Pam 50, 119-120
 Llano de Conejo, C. de (S.L.P.) 39
 Llano Grande, C. de (Oax.) 90
 Llanura, C. de (S.L.P.) 40

 Macho Rey, S. del (Qro.) 57
 Macinga, C. (Ver.) 38, 93
 Madrill, Joe 106
 Magniez, Guy 106
 Maíz, Cd. del (S.L.P.) 29
 Mammoth Cave (Kentucky, U.S.A.) 21
 Manjárez, Sr. 66
 Manos, C. de las (S.L.P.) 127, 128
 Mante, Tamps. 9, 28, 49
 Mapachero, C. de (Chis.) 29
 Mapimí, Dgo. 53
 Marathon Oil 8
 Maravillas, C. de las (Oax.) 95
 Martinez, M. 12
 Martínez, Teo 68
Mastigoproctus giganteus 131
 Matehuala, Su. de (S.L.P.) 39
 Matepalma, S. de (S.L.P.) 28, 49
 Matlahuiahues, Cerro de (Ver.) 22
Maymena cascada 39
Maymena delicata 39
Maymena grisea 39
 McCauley, Frances 122
 McEachern, Mike 50, 141
 McIntire, Jim 51
 McKenzie, David 87, 92, 112, 120, 185
 McKenzie, Martha 87, 92
 McLane, Jim 100, 105
 McLaughlin, Angie 52
 McMaster Univ., Canada 29
 McNatt, Logan 59, 60, 120, 122
 Melendez, Pozo (Gro.) 112
 Menchaca, Juan 116
 Mendoza, Prof. Gabriel 18, 21, 23, 26
 Mendoza, Ver. 19
 Merrill, Glen 25, 26
 Messelier, F. 55
Metagonia 33
Metagonia amica 38

Metagonia atoyacae 33, 38
Metagonia candela 38
Metagonia capilla 38
Metagonia coahuila 38
Metagonia mcnatti 38
Metagonia pachona 38
Metagonia placida 39
Metagonia punctata 39
Metagonia pura 33, 39
Metagonia secreta 39
Metagonia serena 39
Metagonia tinaja 39
Metagonia tlamaya 33, 39
Mexaphaenops 35, 64
Mexaphaenops elegans 35, 41
Mexaphaenops fishi 35, 41
Mexaphaenops intermedius 35, 41
Mexicambala 35, 77
Mexicambala blanda 35, 40
Mexicambala fishi 35, 40
Mexicambala inopis 35, 40
Mexicambala russelli 35, 40
Mexiconiscus 32, 37
Mexisphodrus 36
Mexisphodrus profundus 36, 41
Mexisphodrus tlamayaensis 41
Mexisphodrus veraecrucis 36, 41
Mexiterpes sabinus 34, 40
Mexiweckelia 32, 53
Mexobisium paradoxum 33, 37
 Midnight Cave (Texas, U.S.A.) 55, 56
 millipeds, troglobite 31, 34, 76, 77, 89
 Milpa, C. de la (Pue.) 164, 184, 185
 Mina de las Cuevas (S.L.P.) 51
 Mina de las Juanitas de la Flourita (S.L.P.) 51
 Mina, C. de la (Tamps.) 32, 36, 37, 38, 40, 41, 64, 76, 77, 78, 79, 81 (map), 147
 Miquihuana, Tamps. 28
 Mira, Giaquinto, M. D. 70
 Mitchell, Rexell 8, 96
 Mitchell, Robert, Scott, and Sharon 96
 Mitchell, Robert W. (Bob) 4, 7-10, 25, 26, 32, 36, 49, 51, 76, 77, 78, 79, 96, 104
 mites 34, 51, 131
 Modesto Gómez, Sr. y Sra. 7, 8, 10, 26
Modisimus boneti 39
Modisimus mckenziei 39
Modisimus mitchelli 39
Modisimus rainesi 39
Modisimus reddelli 39
 Moerbe, Stan 101

- Mollhagen, Tony 49
 Mona, C. Grillo de la (Pue.) 92
 Mona, C. Tunel de la (Pue.) 92
 Mona, C. Vampiros de la (Pue.) 92
 Monos, C. or S. de los (S.L.P.) 28, 121, 126, 128
 Montecillos, Sys. de (S.L.P.) 28, 61, 78
 Monteflor, Oax. 90
 Monteflor, Gs. de (Oax.) 90
 Moore, Jim 120
 Mora, Ezequiel 164
 Moral, La C. de (Ver.) 19
 Morris, Neal 57, 58-61, 116, 120, 124-125
 Morris, Theresa 115, 118
 Morse, Ron 12
 Muchacho, C. del (Pue.) 166, 167, 184
 Myers, Del 154, 155
 Mort, John 145
 Murciélago de Xocoyolo, C. (Pue.) 175, 184
 Murphy, Stuart 87, 92
 Myers, Ransom 115
- Nacimiento
 Ojo de Agua 122
 Ojo de Agua Negra 93
 del Río Choy 49
 del Río Frío 55
 del Río Mante 56, 66, 127, 128
 de Riachuelo 50
 de San Juan 48
 Nanacatlan, Pue. 158
 Naranjal, Ver. 21
 National Speleological Society Convention, 1960 8
Neoleptoneta capilla 33, 38
Neoleptoneta delicata 38
Neoleptoneta isolata 33, 38
Neoleptoneta pecki 38
Neoleptoneta rainesi 38
Neoleptoneta reclusa 38
Nesomylacris reddelli 40
Nesticus hoffmanni 38
Nesticus nahuanus 38
Nesticus vasquezae 38
Niptus absconditus 36, 41
Niptus abstrusus 36
 Nogales, Ver. 19
 Norton, Russell M. 63
 Nuevo, Rancho, Chis. 144
 Nuevo, Rancho, Qro. 47, 48
- 184
 Octimaxal Sur n. 2 (Pue.) 155, 179, 184
 Ojo de Agua Grande, C. de (Ver.) 39, 40, 68
 Ojo de Agua de Tlilapan, C. del (Ver.) 32, 33, 37, 39, 68, 93, 94 (map), 112
 Ojo de Agua de Tlilapan n. 2, C. del - see Macinga, C.
 Ojo del Gato (N.L.) 148
 Ojo Zarco, Ver. 20, 93
 Ojo Zarco, C. de (Ver.) 20
 Oligochaeta 32, 37
 Olivares, C. de (Pue.) 184, 187, 189 (map)
 Opilionida 34, 39
 Oregon, Univ. of 8
 Oriental, Sierra Madre 6, 8, 28, 31
 Orizaba, Ver. 18-21, 23, 25, 29
Ornithodoros 131
Ornithodoros turicata 131
Orthoporus 131-132
- Pablillo, N.L. 64
 Pablillo, Su. de (N.L.) 64
 Pachón, C. de El (Tamps.) 38, 39, 40, 41, 66, 76, 78, 79
Pachychitra 33
Pachychitra grandis 33, 37
Pachychitra similis 33, 37
 Palacios, Carlos 63
 Palmas, S. de las (Qro.) 48
 Palmito, Gs. del (N.L.) 3, 4, 6, 11-12, 13-16, 28, 34, 39, 55, 98, 115, 118, 122, 124
Paracophus 35
Paracophus caecus 35, 40
Paracophus cladonotus 35, 40
Paracophus lippus 35, 40
Paracophus placonotus 40
Paracophus reddelli 40
Paracophus sanctorum 40
 Parada, La, S.L.P. 47, 48
 Paraje Nuevo, Ver. 22
Paratrechus (Hygroduvalius) pallescens 35, 41
Paravachonium superbum 33, 37
 Parker, Cecil 78
 Parker, John 100
 Parsons, Gary 122
 Partida, C. de la Sierra (Tamps.) 101, 103 (map), 114
 Paschal, Fred 117, 136-138
 Patos, C. de los (S.L.P.) 50
 Paxalja, S.L.P. 123
 Peck, James H. 63-70
 Peck, Stewart B. 63-70, 106, 144-146

- Pedregoso Circle Cave (Coah.) 39
 Pedregoso, C. del (Coah.) 39
 Pedro El Negro, G. de (D.F.) 148
Pellobunus mexicanus 34, 39
 Peña Borrada, Qro. 47
 Penny, Claude 115
 Perlas, C. de las (Tamps.) 80, 86 (map), 147
 Perra, C. de la — see Capilla, C. de la
 Peschtschera Optimittitscheskaja (U.S.S.R.) 74
 pholcids 33
Pholcophora bispinosa 39
Pholcophora elliotti 39
Pholcophora evansi 39
Pholcophora exigua 39
Pholcophora gruta 33, 39
Pholcophora mitchelli 39
Pholcophora troglodyta 39
Physocyclus bicornis 39
Physocyclus merus 39
Physocyclus pedregosus 39
Physocyclus reddelli 39
 Picacho, Rancho, Tamps. 55
 Piedras, S. de las (S.L.P.) 39, 67
 Piedras Amarillas, C. de las (S.L.P.) 60
 Pinal de Amoles, Qro. 29, 62, 67
 Pinos Ramas, C. de las (Chis.) 38, 68
 Pinta, C. (S.L.P.) 33, 37, 49, 126, 128
 Pipa, S. de la (S.L.P.) 60
 Plan, S. del (Tamps.) 56
 planarians, blind, see also flatworms 31, 32
 Plasky, Steve 18-21
Plecotus mexicanus 80
 Poca Ventana, C. de (S.L.P.) 39
 Poncho Sierra, Gs. de (Pue.) 155, 164, 167, 170
 (map), 184
 Ponciano Arriaga — see San Ricardo, Rancho
 Porra, S. de la (S.L.P.) 6, 40, 67, 141, 143 (map)
 Port Neches High School 8 CUEVA
 Porvenir, El, Tamps. 77, 79, 80
 Porvenir, S. de El (Tamps.) 80, 112, 125 (map)
Poterpes egeo 34, 40
Poterpes fishi 34, 40
 Potrerillos, C. de los (S.L.P.) 33, 34, 38, 40, 87
 Pozo, S. del (S.L.P.) 6, 57
 Precipicio, Gs. del (N.L.) 98, 100, 116, 119, 122,
 148
Procambarus 32
Procambarus villalobosi 32, 37
 Profesor, S. del (Ver.) 41
 Provatina (Greece) 121
Pseudosinella 35
Psilochorus diablo 39
Psilochorus fishi 39
Psilochorus russelli 39
Ptomaphagus 36, 63, 64, 66
Ptomaphagus elabra 36, 41
Ptomaphagus troglomexicanus 36, 41
 Puente, C. de El (S.L.P.) 29, 34, 40, 51
 Puente, C. de la — see Puente, C. de El
 Puente de Dios, C. del (Qro.) 29
 Puerto del León, C. del (Qro.) 38, 40
 Puerto Redondo, N.L. 28
 Purisma, La, Qro. 56
 Quile, Hoya de (S.L.P.) 123
 Quitál, Hoya de (S.L.P.) 123-124
 Quintero, Tamps. 50
 Quintero, Gs. de (Tamps.) 6, 66, 76, 78, 80
 Raimond, M. 55
 Raines, Terry W. 3, 7, 21, 23-26, 53, 55, 61, 80
 Ralph, Ron 50, 53, 119, 141
 Rancho del Cielo n. 7, C. del (Tamps.) 40, 79
 Rancho Nuevo, C. de (Chis.) 29, 68, 70
 Ransom, Barb 121
 Real de Catorce, S.L.P. 54
 Real de Catorce, La C.-Mina de (S.L.P.) 54
 Reddell, James R. 3, 5, 13-16, 17, 21, 23-26, 31-36,
 49, 52-54, 63, 67, 70, 75, 76, 77-78, 78-79, 80,
 87-91, 92-95, 96, 112, 113, 129-134, 185-190
 Rescue, cave 99
 Reyes, José Luís Mineses 158
Rhadine 64
Rhagidia trisetatus 34, 39
 Rhoades, Robert (Bob) 59, 122
 Rhodes, William (Dub) 8-10, 51
 Riachuelo, C. de (S.L.P.) 50
 Richardson, Alfred 66
 Ricinulei 34, 39
 Ricinuleids 31, 34, 53, 63, 78, 79
 Rigg, Rick 154
 Río
 Apulco 154
 Boquilla 50
 Comandante 50
 Conca 56
 Galeanas 49
 Huichihuayán 26, 57
 Ojo Frío 49
 San Jerónimo 56, 62
 Santa María 49, 50
 Tampaón 49, 50

- Tamuín 49, 50, 78
 Tonto 88
 Usumacinta 141
 Zempuala 154
 Río Choy, C. del Nac. del (S.L.P.) 67, 127, 128
 Río Frío, C. del Nac. del (Tamps.) 38, 39, 40, 64, 79
 Río Huichihuayán, C. del Nac. del (S.L.P.) 67
 Río Jalpan, C. del (Qro.) 29
 Río San Antonio, C. del Nac. (Oax.) 89, 92, 95
 Río San Gerónimo, C. de (Gro.) 56, 62
 Riscos, C. de los (Dgo.) 34, 39, 53, 54
 Rodemaker, Jim 120
 Rodeo, Rancho, S.L.P. 49
 Rodriguez, Sr. 115
 Roja, Francisco 48
 Rose, Dr. Francis 49, 77
 Rosenthal, Walt 62
 Rowland, J. Mark 96, 106
 Rubio, Emiliano 48
 Russell, Carol 50, 90
 Russell, Philip 15
 Russell, Wayne 55, 100, 107
 Russell, William (Bill) H. 5, 7, 8, 21, 23-26, 27-30, 47-49, 49-50, 55-56, 58, 79, 80, 90, 107, 112, 120-121
 Sadek, Frank 122
 Sala de Vega, Oax. 29
 Salaíces, Chih. 53
 Salamander Cave (Tamps.) 66
 Salas, S. de Joya de (Tamps.) 6, 28, 35, 39, 40, 41, 97
 Salitre, C. del (S.L.P.) 67
 Saltatoria 35, 40
 San Andres, Ver. 19, 20
 San Antonio, S. de (S.L.P.) 6, 52
 San Bartolo, Gs. de (N.L.) 38, 64
 Sánchez, Paulino 66
 San Cristóbal de las Casas, Chis. 29, 68, 144
 San Francisco, S.L.P. 50, 51, 52
 San Francisco, C. de (Chis.) 29, 38, 39, 69, 70
 San Francisco, S. de (S.L.P.) 29, 52, 121
 San Francisco no. 2, S. de (S.L.P.) 51
 San José del Arco, C. del Su. (Chis.) 69
 San Juan, Rancho, Qro. 48
 San Luis Potosí, S.L.P. 29
 San Marcos, Texas (U.S.A.) 32
 San Rafael, S. L. P. 47, 123
 San Rafael, C. de (S.L.P.) 47, 123
 San Rafael de los Castros, S. de (Tamps.) 80
 San Ricardo, Rancho (Ponciano Arriaga), S.L.P. 49
 San Sebastian, Gs. de la (Oax.) 29, 90
 Santa Catarina, Oax. 91
 Santa Catarina, C. de (Oax.) 91
 Santiago, Modesto 172
 Santo Domingo, C. de (Qro.) 59
 Sautereau, J. 55
 Sayther, Nancy 116
 Sayther, Terry 62, 116, 119
 Sbordon, Valerio 93
 Schizomida 33, 38
Schizomus 33
Schizomus cookei 38
Schizomus longimanus 38
Schizomus mexicanus 38
Schizomus mitchelli 38
Schizomus reddelli 38
 Scialet de Genieux (France) 74
 Scorpionida 32, 37
 scorpions, blind 31, 32, 68, 77, 130
 Seamay, C. (Alta Verapaz, Guatemala) 69, 70, 146
 Secundarios, C. de los (Tamps.) 101, 139, 140 (map)
 Selva, C. de la (S.L.P.) 38
 Semple, Señora Berta 7
 Sepacuite no. 1, C. (Alta Verapaz, Guatemala) 70
 Sepacuite no. 2, C. (Alta Verapaz, Guatemala) 70
 Sepacuite no. 3, C. (Alta Verapaz, Guatemala) 70
 Sevenair, Dr. J. P. 57, 58
 Shawcross, Mike 107, 146
 Shepperd, Jim 79
 Shields, René 124
 Shoemake, Roger 8, 9, 10
 Shofstall, Don 121
 shrimp, blind 32, 89, 90
 Sierra Partida, C. de la (Tamps.) 139
 Siffre, Michel 55
 Silvino, Gs. El (Izabal, Guatemala) 69
 Siquita, C. de la (Dgo.) 32, 53
 Slemaker, Carroll 27
 Smalley, Dr. Al 146
 Smith, Marion O. 56-58, 120
 Soldado, C. del (Ver.) 93
 Sotanito – see Ahuacatlán, Sotanito de
 Soyate, S. de (S.L.P.) 28, 49, 127
 Speleological Survey of Mexico 5, 23, 27
Sphaeriodesmus 35
 spiders, cave 33, 38, 51, 52, 77, 78, 89, 131, 144
 Sprouse, Peter 98-99, 112, 117-118, 120, 122-124
 Spukil, C. (Yuc.) 120
 Steele, John 124

- Stenopholea reddelli* 36, 41
Stenotodesmus amarus 40
 Steven F. Austin State College 8
 Stidham, David 56
Stilicolina condei 36
 Storek, José 63
 Strait, Doug 56
 Strandtmann, Dr. Russell 7, 34
Streptostyla 141
 Strickland, James 15
 Strickland, Peter 59, 97, 102, 114, 120, 122, 124
 Strinati, Pierre 76
Strongylodesmus harrisoni 34, 40
 Sumner, Joe 51
 Swallows 19, 20, 124
 Syme, Rod 144-146
Syrrhophus dennisi 41
 Syrusik, Peter 121

Tadarida brasiliensis mexicana 133
 Tamapatz, S.L.P. 49
 Tamasopo, S.L.P. 29
 Tampico, S.L.P. 18
 Tamazunchale, S.L.P. 29
 Tanchipa, C. de (S.L.P.) 49, 50, 58, 60, 120, 126, 128
 Tancoyol, Qro. 48
 Tandy, Mills 17
 Taninul n. 1, C. de (S.L.P.) 34, 76
 Taninul n. 4, C. de (S.L.P.) 66, 127
 Tansosob, S.L.P. 47
Tarantula 131
 Taylor, Glenn 77
 Teal, David 56
Tegenaria 33
Tegenaria blanda 38
Tegenaria decora 38
Tegenaria gertschi 38
Tegenaria mexicana 38
Tegenaria rothi 38
Tegenaria selva 38
 Tetre, S. del — see Tigre, S. del
 Tejamanil, S. de (Qro.) 41
 Teleostei 36
 Tenextepac, Gs. de (Pue.) 164, 166-167, 168 (map), 173 (photo), 184
 Tequila, Ver. 4, 6, 18-21, 23, 25, 26, 29, 32
 Tezonapa, Ver. 25
Texas Caver, The 12, 16, 17, 26, 54
 Texas Prusik System 5
 Texas Region Project, 1960 3, 4, 13
 TSA Convention, 1962 5
 TSA Convention, San Angelo 23
 Tezonapa, Gs. de (Ver.) 88
 Thompson, B. C., Tommy 56
 Thysanura 35
 Tibbetts, Leonard 8-10
 Tierrosa, G. (N.L.) 118
 Tigre, C. del (Pue.) 92
 Tigre, S. del (S.L.P.) 5, 28, 34, 78
 Tinaja, S. de la (S.L.P.) 5, 6, 17, 28, 32, 37, 38, 39, 79
 Tio Ticho, C. del (Chis.) 37
 Tipton, Ginny 78, 79
 Tlamaya, S.L.P. 5, 7, 8
 Tlamaya, S. de (S.L.P.) 5, 6, 7, 10, 28, 33, 39, 40, 41
 Tlilapan, Ver. 19
 Tracey, A. G. 107
 Tres Manantiales, C. de (Tamps.) 28, 38
 Tricladida 32, 37
Trigaster 32
Trigaster reddelli 37
Trigaster vallesensis 37
 Trinitaria, C. — see San Francisco, C.
Troglocubanus 32
 Troncones, C. de los (Tamps.) 129
 Tucker, Gary 78
 Tuxtla, Chis. 22
Typhlochactas 130
Typhlochactas elliotti 32, 37
Typhlochactas reddelli 32, 37
Typhlochactas rhodesi 32, 37
Tyrannochthonius troglobius 33, 37

 Ultima Tirón, La Mina de la — see Valdosa, C. de
Uculabes crispis 34, 40
Uculabes versatilis 34, 40
 Ungaria, C. de (Ver.) 88, 133
 Ungurria, C. de — see Ungaria, C. de
 University of Texas Grotto 13
 Vaca, C. de la (Izabal, Guatemala) 69
 Valainis, Eric 121
 Valainis, John 121
 Valdosa, C. de (S.L.P.) 67, 147
 Valle de los Fantasma, S.L.P. 50-52
 Valle de los Fantasma, Cave at (Qro.) 41
 Valles, S.L.P. 5, 10, 17, 23, 25, 26, 28, 29, 49, 50, 51, 58
 Vampiros, C. de los (Tamps.) 37
 Vampiros, C. de los (Ver.) 93
 Van Note, Mike 121

Vasquez, Dionicio 119
 Vásquez, S. de (Tamps.) 59, 114
Vejovis gracilis 37
 Venadito, S. de (Tamps.) 6, 28, 78
 Ventana Jabalf, C. (S.L.P.) 6, 49, 67, 127, 128
 Vibora, C. de la (Pue.) 162, 184, 186
 Vientos, C. del (N.L.) 148
 Villa de García, Grutas de (N.L.) 28, 33, 38, 39, 64, 112
 Villalobos, Alejandro 32
 Vinson, Barbara 57, 58, 116, 120, 124
 Vinson, Willie 124
 Virgen, C. de la (Tamps.) 40
 Virgen de Guadalupe, C. de la (Tamps.) 39

Wajdenfeld, M. 55
 Walker, Greg 117
 Walsh, Mike 54, 75, 100-101, 107
 Washington, Abrey 126
 Wesp, Erwin (Irwin) 12, 15
 White, Jack 80
 White, Tom 15
 Wigginton, Larry 120
 Wiley, Suzanne 78, 79
 Wilkens, Horst 107
 Williams, Judy 59
 Wilson, Ted 56, 60
 Wingert, John 121
 Wisener, Alicia 122
 Wright, Tom 136-138
 Wygodzinsky, Pedro 108

Xenopsylla cheopis 132
 Xiliapa-Mecatigpa-Neccal, C. (Pue.) 153, 172-173, 184
 Xilitla, S.L.P. 4, 6, 7, 10, 25, 26, 28, 31, 32, 34, 47, 52, 86
 Xochipila, C. de la (Pue.) 92
 Xochitl Cave (Pue.) 153, 162-163, 184
 Xochitlán, Pue. 158
 Xocoyolo, C. de (Pue.) 154, 155, 157, 174-176, 184, plate 4 (map)
 Xoxafi, Gs. de (Hgo.) 36, 39, 41
 Xtacumbilxunam, Gs. de (Campeche) 61, 95

Yerbaniz, S. de (S.L.P.) 28, 32, 33, 37, 49, 127
 Yohuatichan, Su. de (Pue.) 157, 182-183 (photos), 184, plate 2 (map)
 Youmans, Jim 56
 Yucatán, México 21, 27, 29, 61-62, 92-95, 119-120
Yucodesmus hoctunarus 40

Zacapoaxtla, Pue. 153, 156 (area map)
 Zambrano, Sergio 112
 Zapaluta, C. — see San Francisco, C.
 Zapotitlan, Pue. 158
 Zapotitlan, Gs. de — see Karmidas, Gs.
 Zaragoza, N.L. 28
 Zaragoza, S.L.P. 51
 Zeman, Steve 120, 122
 Zimapán, Hoya de (S.L.P.) 28
 Zongolica, Ver. 20, 21

Abbreviations used:

C. — Cueva
 G(s). — Gruta (s)
 Guat. — Guatemala
 Nac. — Nacimiento
 S. — Sótano
 Su. — Sumidero
 Sys. — Systema
 Chih. — Chihuahua
 Chis. — Chiapas
 Coah. — Coahuila
 D. F. — Distrito Federal
 Dgo. — Durango
 Gro. — Guerrero
 Hgo. — Hidalgo
 N.L. — Nuevo León
 Oax. — Oaxaca
 Pue. — Puebla
 Qro. — Querétaro
 Sin. — Sinaloa
 S.L.P. — San Luis Potosí
 Son. — Sonora
 Tab. — Tabasco
 Tamps. — Tamaulipas
 Ver. — Veracruz
 Yuc. — Yucatán

