

A photograph of a large, dimly lit cave. The cave walls are made of rough, layered rock. A person wearing a hard hat and a backpack is standing in the center of the cave, looking towards a dark opening in the distance. The lighting is warm and focused on the person and the surrounding rock formations.


AMCS
ACTIVITIES
NEWSLETTER

Number 13
September 1983



MÉXICO

PLACES IN THIS ISSUE

- 
- A black and white outline map of Mexico, showing state boundaries. Several locations are marked with small circles, and lines connect these markers to text labels. The labels are: Purificación / Calenturas (in the north-east), Coyotas (in the north-east), Tolaltongo (in the west), Ayockal / Santa Elena (in the south-east), Huautla (in the south-east), Pozo Blanco (in the west), Zongolica (in the south), and San Cristobal (in the south-east).
- Purificación / Calenturas
 - Coyotas
 - Tolaltongo
 - Ayockal / Santa Elena
 - Huautla
 - Pozo Blanco
 - Zongolica
 - San Cristobal

AMCS ACTIVITIES NEWSLETTER

Number 13

September 1983

COMMENTARY

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When we started on the issue of the AMCS Activities Newsletter which you now hold, we decided to have two co-editors in order to divide and expedite the work. The concept worked extremely well—so well that I feel somewhat embarrassed at having the title of editor! I personally did not carry much of the burden of editorship, so I would like for credit to be given to those who deserve it. First, Terri Sprouse is to be thanked for doing most of the layout work and all of the coordination with the printer, Terry Raines. Bill Mixon, my co-editor, did almost all of the final proofing and typing of the text. And were it not for Peter Sprouse this Newsletter probably would not be here, since he compiled many of the articles that you see.

So enough of such carryings-on. If you are like any normal person, you bought this publication to read about caving, not a bunch of acknowledgements and drivel (even if sincerely intended). That being the case, I feel that your long awaited literary purchase will be well rewarded. First, I am sure that you have noticed our color cover. Terry Raines contributed it gratis (almost). Next, we have two reports on continuing projects: Huautla and Purificación. Many other interesting reports on recent explorations round out the issue.

You might notice that our type face is somewhat smaller than in the past. This was a technical problem based on typewriter availability and questionable advice. Hopefully it will not be as aggravating as an undersize issue with a faulty binding as Number 12 was.

One final note is in order before you proceed. We have two articles on the same cave. One calls the cave Tolantongo and the other, Tolaltongo. These are the same cave. It often happens that in México, local spellings for Indian names can differ, depending on the source. This is primarily due to the fact that the languages on which they are based are often not written.

Duwain Whitis

The AMCS Activities Newsletter is published by the Association for Mexican Cave Studies, a non-profit group dedicated to the conservation and study of the caves of México. Articles, maps, and photographs on caving and speleology in México are solicited. A list of publications and prices is available on request.

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ERRATA

The inside back cover of AMCS Activities Newsletter No. 12 was taken by Bill Stone, not Jerry Atkinson as indicated.

Cover Photo: Patty Mothes illuminates Fissureland in the Cueva de Infiernillo section of Sistema Purificación. (Peter Sprouse)

Frontispiece: The 126 meter entrance drop to Pozo de Lentiscos, Colima. (Carlos Lazcano)

Rear Cover: Entrance chamber of Sótano de Las Calenturas. (Terry Raines)

Mexico News

by Peter Sprouse

Chiapas

The British Speleological Expedition - Mexico 82 spent eight weeks in Chiapas in 1982-83. Their initial explorations were carried out in some high hills (2200 to 2300 meters) near San Cristobal de las Casas. Many shafts were investigated, but most were choked or silt-filled after 100 meters or so. The deepest was Sima de la Puerta, a broken shaft 149 meters deep. Two promising caves were found that became too tight at 70 meters depth and would need enlarging. San Cristobal itself is in a large polje that floods periodically. A 4.2-kilometer tunnel was dug in 1974 to prevent flooding of the town.

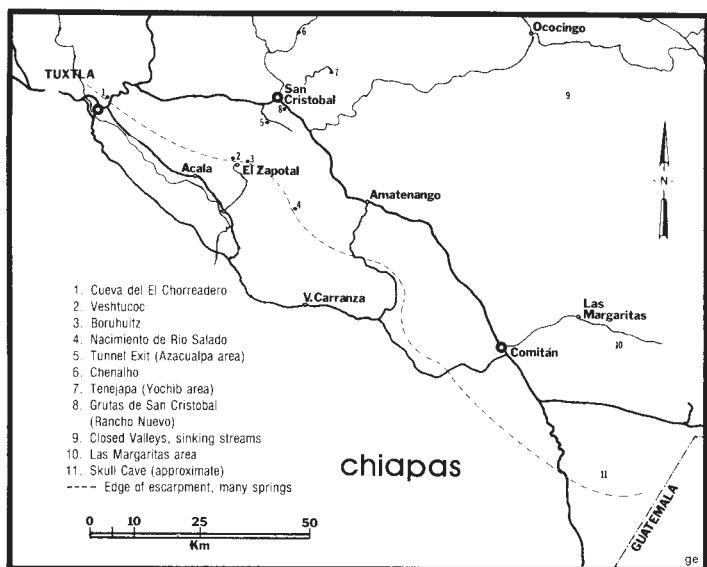
Splitting up into smaller groups, the expedition then checked some areas farther from San Cristobal. A promising area was found at Las Margaritas, near Comitán. Two sumideros, both of which sumped, were explored for a total of 2 kilometers of passage. One of these, Sumidero Recuerda, had a long ramp sloping at 25 to 30 degrees. Thirty caves were found in the Las Margaritas area, some with large, well-decorated passage. The longest cave found was 2.5 kilometers long, the deepest, 145 meters. One cave contained one hundred human skulls, flattened on the back side.

A small group investigated a cave near Lopez Mateos, 50 kilometers from San Cristobal. They descended a 20-meter drop to a stream passage, which they followed for 200 meters of well-decorated passage before running out of equipment. Returning the following day, they were just beginning the survey at the bottom of the drop when someone tried to pull up their rope. The four cavers quickly climbed out to find a group of fifty angry Indians with large sticks and machetes. They were allowed to leave after paying a hefty fine to the jefe.

The final part of the expedition concentrated on the San Lucas area near Acala, at 700 meters elevation. Cueva de Ojo de Agua contained 300 meters of dry passages, but no way could be found into a 2-to-3 cumec stream resurging nearby. A dry resurgence cave, Borohuitz, consisted of a large passage sloping down to a depth of 130 meters. The entrance is 70 by 60 meters and very spectacular. There are two blowing boulder-choke leads at the bottom. The longest cave found was Veshtucoc, 3.5 kilometers long and trending upwards to 280 meters total depth. The cave was unexplored by the locals due to the sump just inside the entrance. Water spurts out of the entrance during floods. A large streamway, Pacific Highway, led to a large, well-decorated breakdown passage ending in a 10-meter drop. Below this was a series of stream passages with two sumps. Beyond the second sump was a complex area that gave way to a passage climbing upwards on a 30-degree slope, gaining 240 meters in over 2 kilometers of fine passage. A boulder pile halted exploration, but various leads with airflow remain. Also visited was the Nacimiento del Río Salado, a deep resurgence with a short dry passage over it.

A return expedition is planned for 1984. A full report of the expedition is due to be published in the *Transactions of the British Cave Research Association*.

Sources: Steve Foster,
Howard Limbert-Caves & Caving,
Gill Ediger



An issue of *Mexico Desconocido* publicized a large undescended pit near Tuxtla Gutierrez. Carlos Lazcano

and Guillermo Mora visited the pit in May 1982. Sima del Copal is 150 meters in diameter and 126 meters deep, of which 93 meters is the vertical drop. The floor of the pit is covered with dense jungle, and along one wall there are many pictographs. How the ancients entered is unknown.

Source: Carlos Lazcano S.

Colima

Continuing their successful work of 1982 (see article this issue), SMES cavers returned to the Cerro Grande area in the spring of 1983. They explored thirty new pits on the north end of Cerro Grande along the Jalisco state line. The deepest of these was Pozo de los Lentiscos, 203 meters deep with a 126 meter entrance drop. Resumidero de Vizcaino was explored to 150 meters depth; its second drop is 116 meters. A third deep pit, Pozo de los Otatillos, has an entrance drop of 105 meters. Two other caves over 100 meters deep that

still go are Resumidero del Barbecho (105 meters) and Resumidero de la Cañada (100 meters).

North of Cerro Grande into Jalisco, a preliminary investigation was made of the Cerro de Enmedio. Numerous pits were found but not entered. A large fault-formed canyon separates the two mountains. Before reaching this canyon, water sinks into Resumidero de Toxin at 1200 meters elevation. This cave has three entrances and contains passages 6 to 8 meters wide and 5 to 10 meters high. One thousand meters have been explored, while 400 meters of passage have been mapped. The water likely resurges 7 kilometers away and 200 meters lower at La Taza.

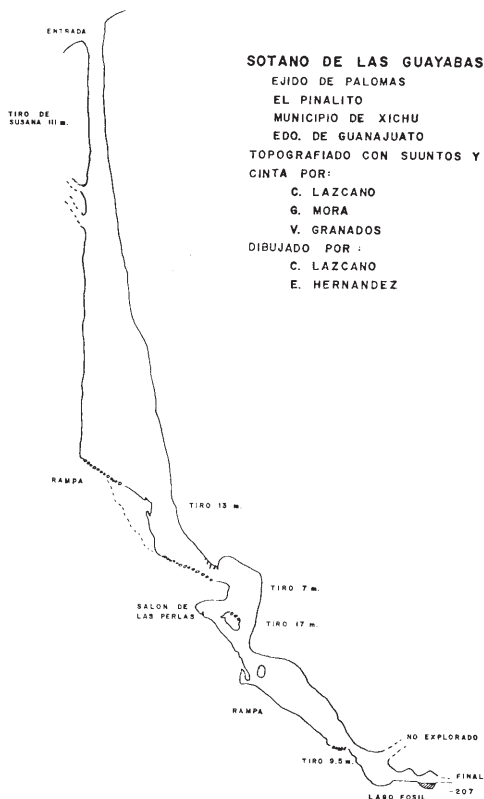
Source: Carlos Lazcano S.

Guanajuato

Cavers of the Sociedad Mexicana de Exploraciones Subterráneas (SMES) have continued to explore westward from the La Florida, Querétaro area. Joined by French cavers in December 1981, they explored sixty pits near El Durazno, El Toro, and El Pinalito. Sótano del Lobo was explored down six drops to a depth of 137 meters.

At El Pinalito, twelve hours hike from the road, Jean-Marie Hachete and Carlos Lazcano discovered Sótano de las Guayabas. This has an entrance drop of 111 meters, followed by a steep ramp and 10-meter drop. At this point the two cavers ran out of rope. SMES cavers returned in the spring of 1982 and pushed the cave down three more drops to the bottom at -207 meters.

Source: Carlos Lazcano S.



Hidalgo

In May 1981 SMES members Isabel Vivian, Noé Delgado, Luis Alfonso Lazcano, and Carlos Lazcano investigated areas in northern Hidalgo near Pacula and San Francisco. Five pits were explored in two large poljes near Pacula, the deepest being 24 meters. Better results were obtained at San Francisco, at an elevation of over 2000 meters. Twenty-three pits were discovered,

of which twelve were mapped and explored. The deepest of these was the Sótanos Cuates, 77 meters deep. Many pits remain to be explored, some of them estimated by rock-drop times to be over 60 meters deep.

Source: Carlos Lazcano

is heavily visited by local people without caving experience.

Source: Alejandro Villagomez

México

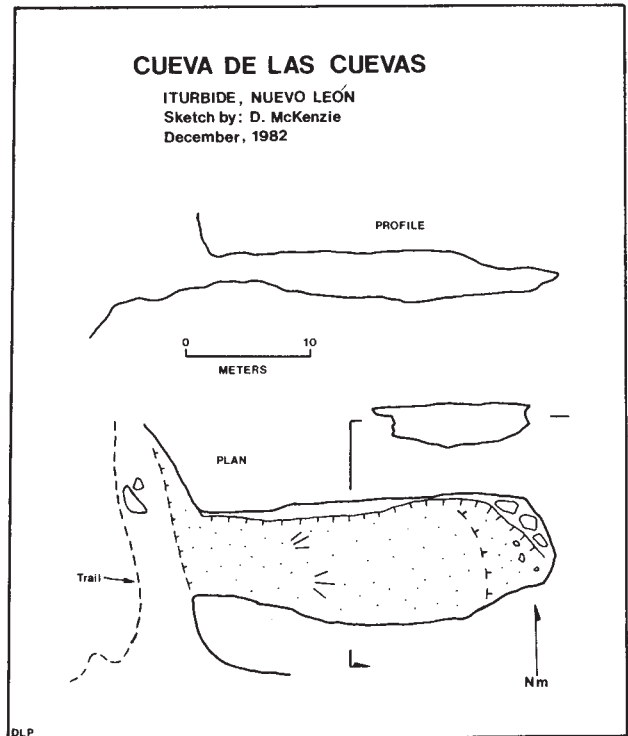
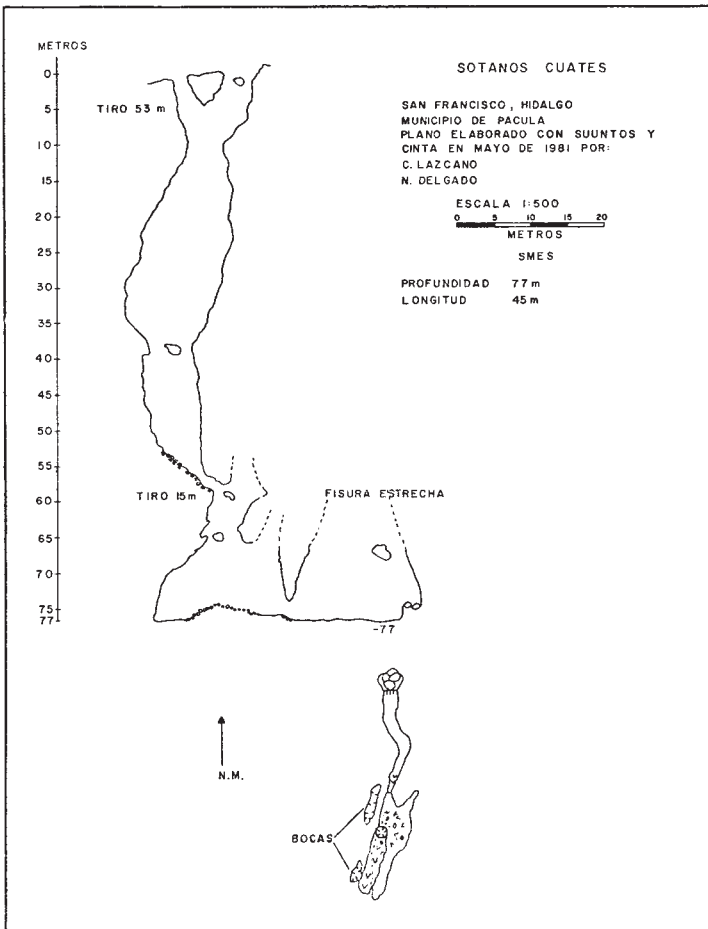
Members of the Guayateno Caving Club have surveyed a lava tube complex near the Channel 13 station on the Periférico south. Cueva de Pedro el Negro has three segments, one of which is divided by the entrance collapse. The short isolated segment is called Cueva de las Personas Perdidas. The main cave consists of large passage for a few hundred meters to a crawl. Beyond is a Y junction. The way to the left goes through three or four crawls before it ends. The right passage goes through a breakdown pile to a large passage, which also ends. Pedro el Negro

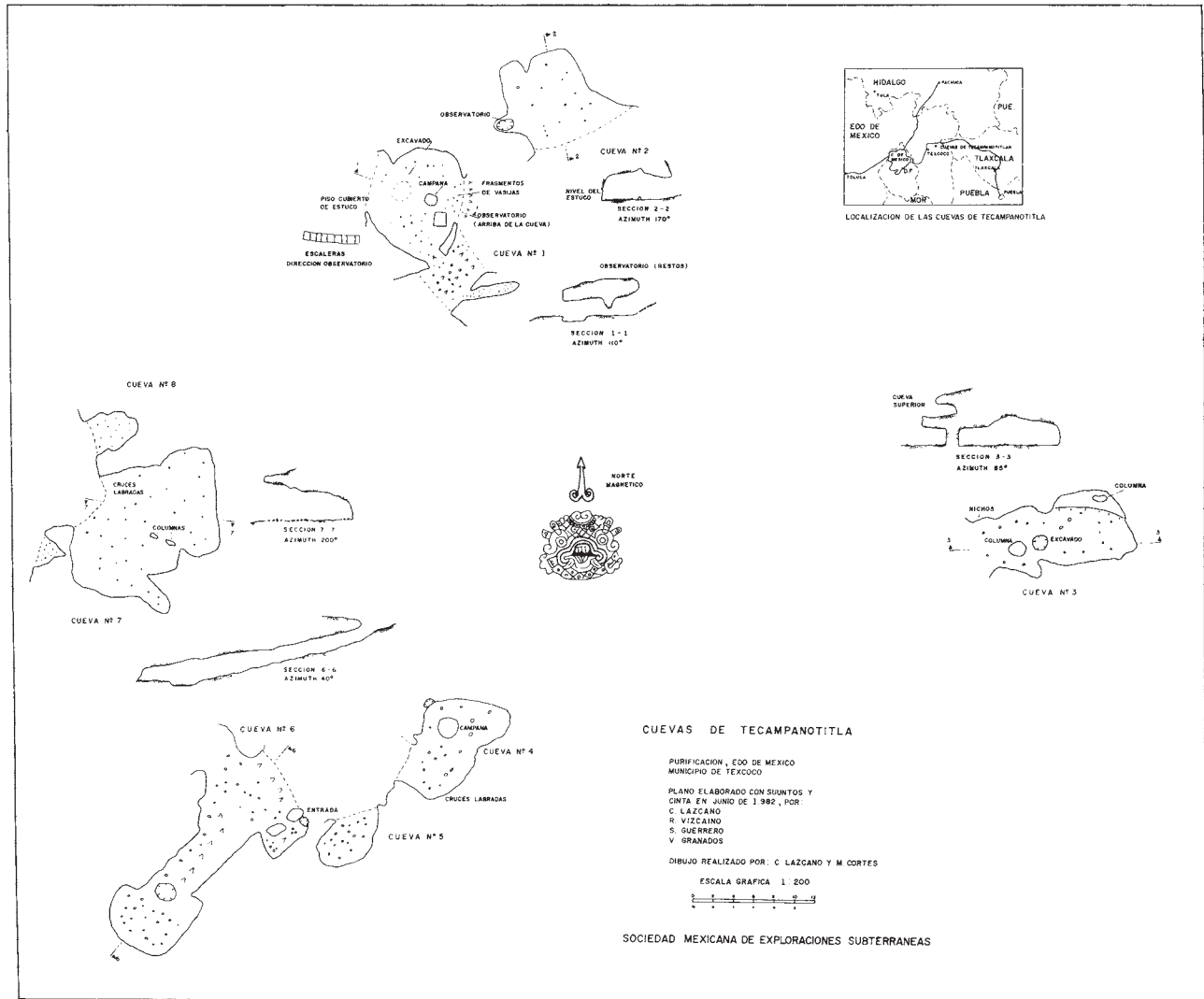
The Sociedad Histórico de Texcoco invited members of the SMES to survey some interesting caves in June 1982. The Cuevas de Tecampanotitla are not natural, but were excavated by the Aztecs in prehispanic times. They are in volcanic conglomerate and were used as an observation post overlooking the Valley of Mexico.

Source: Carlos Lazcano S.

Rebeca Vizcaino and members of the Guayateno Caving Club are planning to survey the caves of Cerro de la Estrella, Ixtapalapa. Seven caves have been located, some of them possibly archaeological sites. They are formed in lava and sand. Some small blister caves have also been found.

Source: Alejandro Villagomez





Nuevo León

Two areas were investigated west of Hualahuises by two groups of AMCS cavers in December 1982. The Río Potosí canyon was entered from the coastal plain, and a large entrance was seen high on a canyon wall. A return trip is planned to attempt a climb into the cave. South of Laguna Santa Rosa at Las Cuevas, various shelter caves are situated in a conglomerate bank of the Cañon el Saucillo. The largest of these is 30 meters long and is used as a goat shelter.

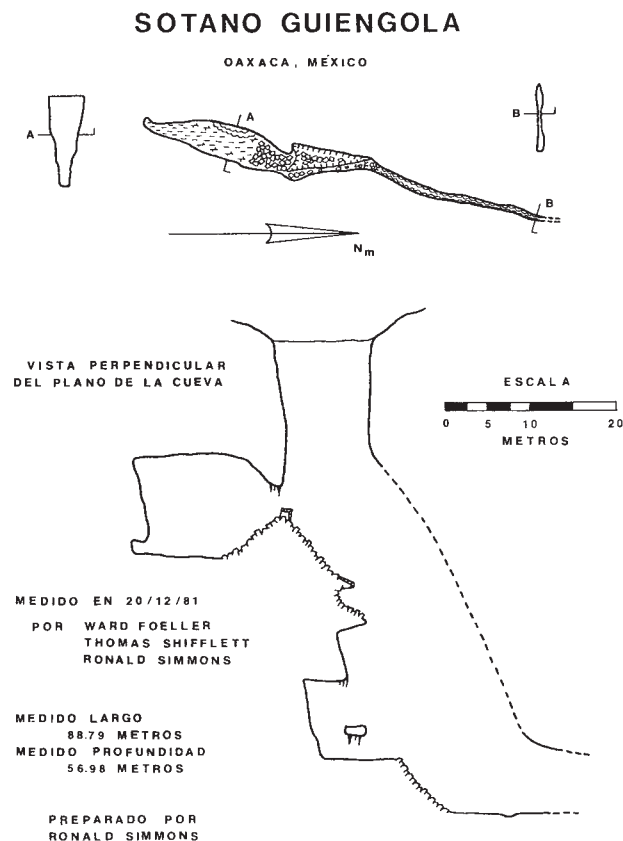
Sources: David McKenzie,
Dale Pate

Oaxaca

The Sierra Guiengola on Highway 190 near Tehuantepec was investigated for caves in December 1981 by Ward Foeller, Tommy Shiflett, and Ron Simmons. Directed to the area by an archaeologist from Oaxaca, they discovered a cave with three entrances near a Zapotec pyramid. One entrance is a 20-meter drop, and the total depth of the cave is less than 40 meters. In some nearby hills, a collapse-passage canyon led to two entrances. Both caves were short, ending in flowstone or fill. Higher up the mountain, at 800 meters elevation, the cavers explored Sótano de Guiengola, which went down two drops to a very tight canyon.

A cool breeze blew out, but it was too small for human passage. In a room at the bottom of the first drop they observed a green, crab-like insect 13 centimeters across that retreated rapidly at their approach. After descending the mountain, they spotted a large entrance from the road. The 20-by-25-meter entrance ended shortly in a flowstone choke.

Source: Tommy Shiflett



Puebla

In spring 1982, a group of Belgian cavers from the G.S.A.B. succeeded in pushing the river caves of the Zoquitlán, Puebla area well beyond previous exploration. The AMCS expeditions of years past had encountered high water conditions during their 1976 and 1978 winter attempts on the river caves. The drier spring weather of 1982 brought success to the Belgians, leaving the caves with practically no running water. The Sumidero del Río Xocotlat

was subsequently bottomed after thirteen drops at a breakdown-and-clay-banked lake, for a depth of 323 meters (+15, -308). Essentially no leads remain, and the surveyed length is approximately 1500 meters.

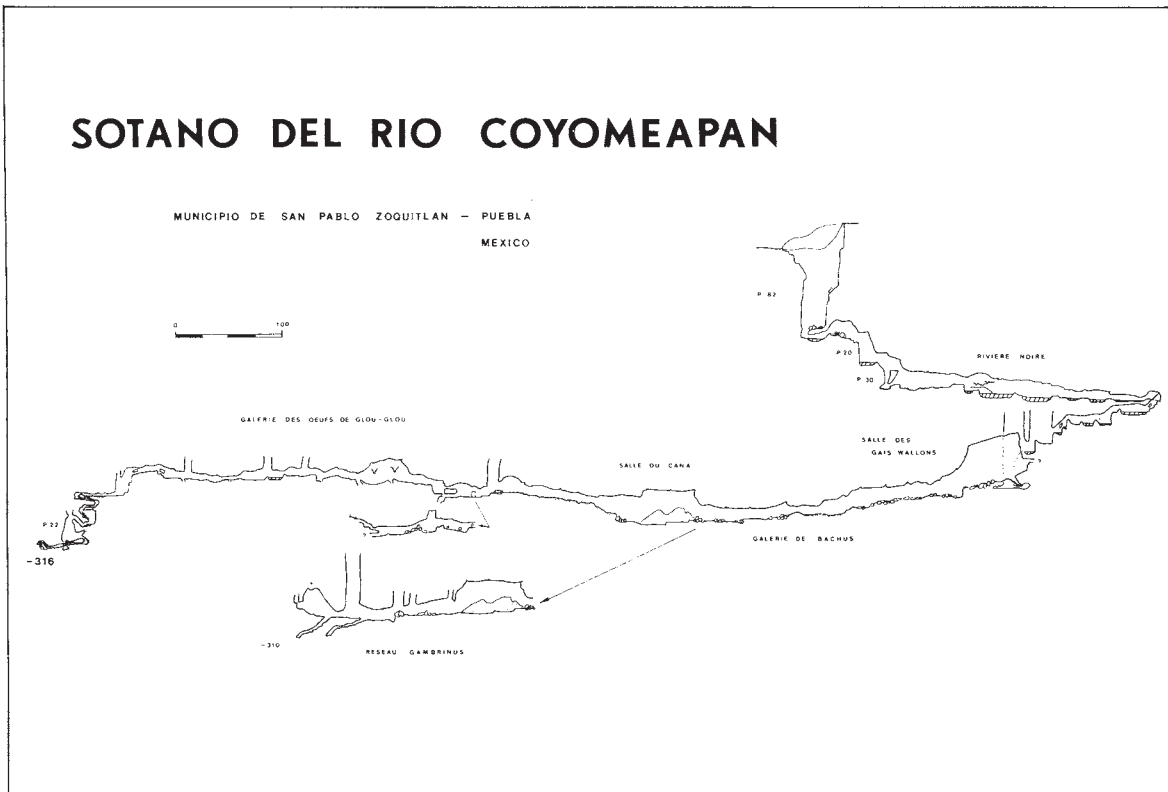
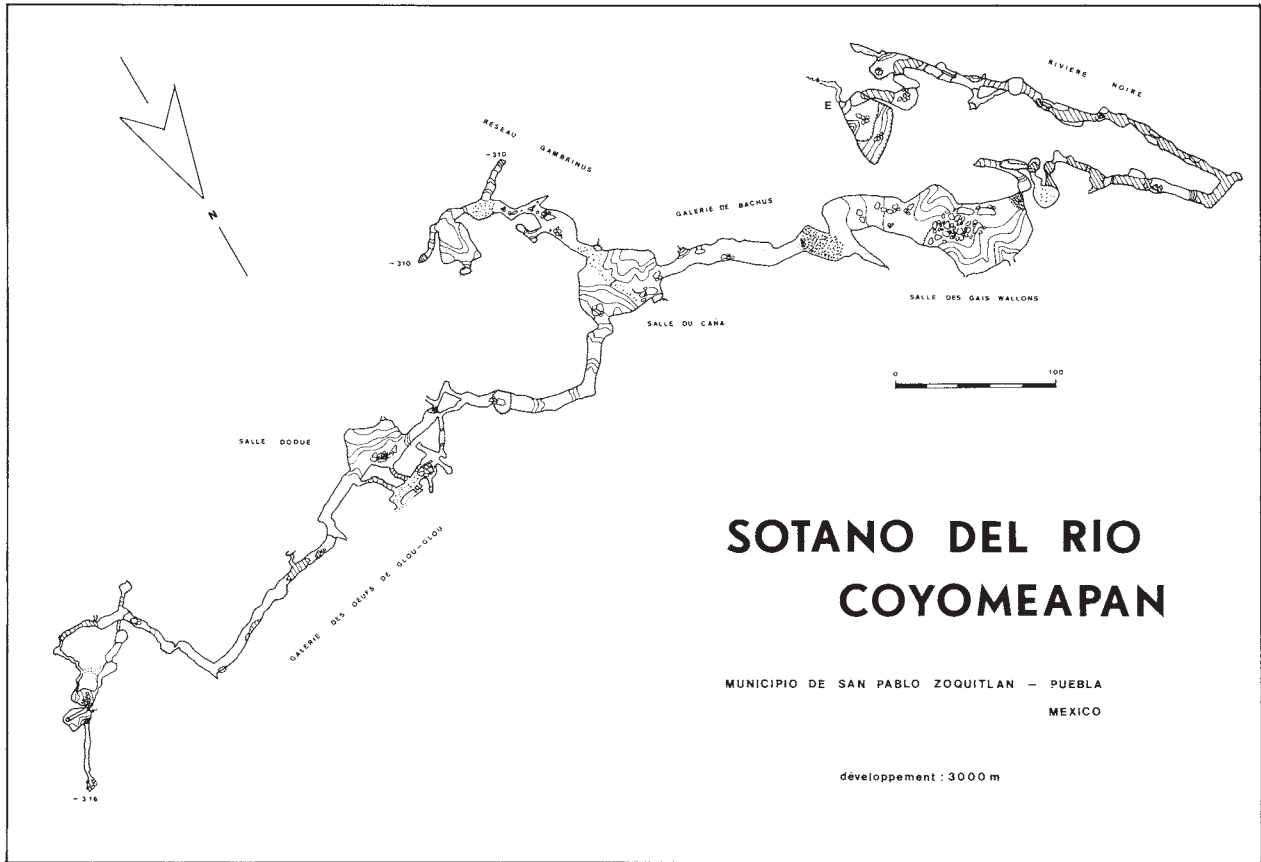
Exploration in the nearby Sótano del Río Coyomeapan continued down seven drops to a series of large rooms and fossil passages. Although significant leads remain, attempts to push the cave deeper than the Sumidero del Río Xocotlat were blocked by sumps and breakdown chokes. The current surveyed depth of the cave is 316 meters, with an approximate length of 3000 meters. Considerable potential exists for new discoveries.

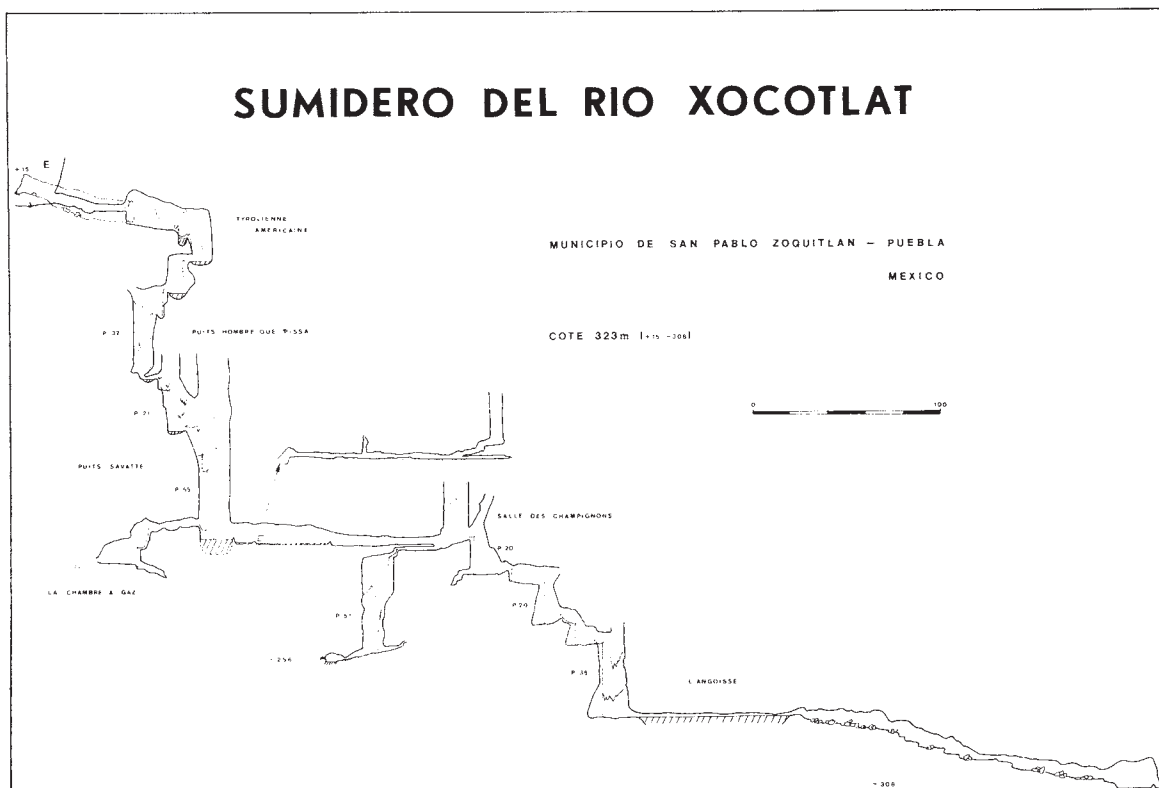
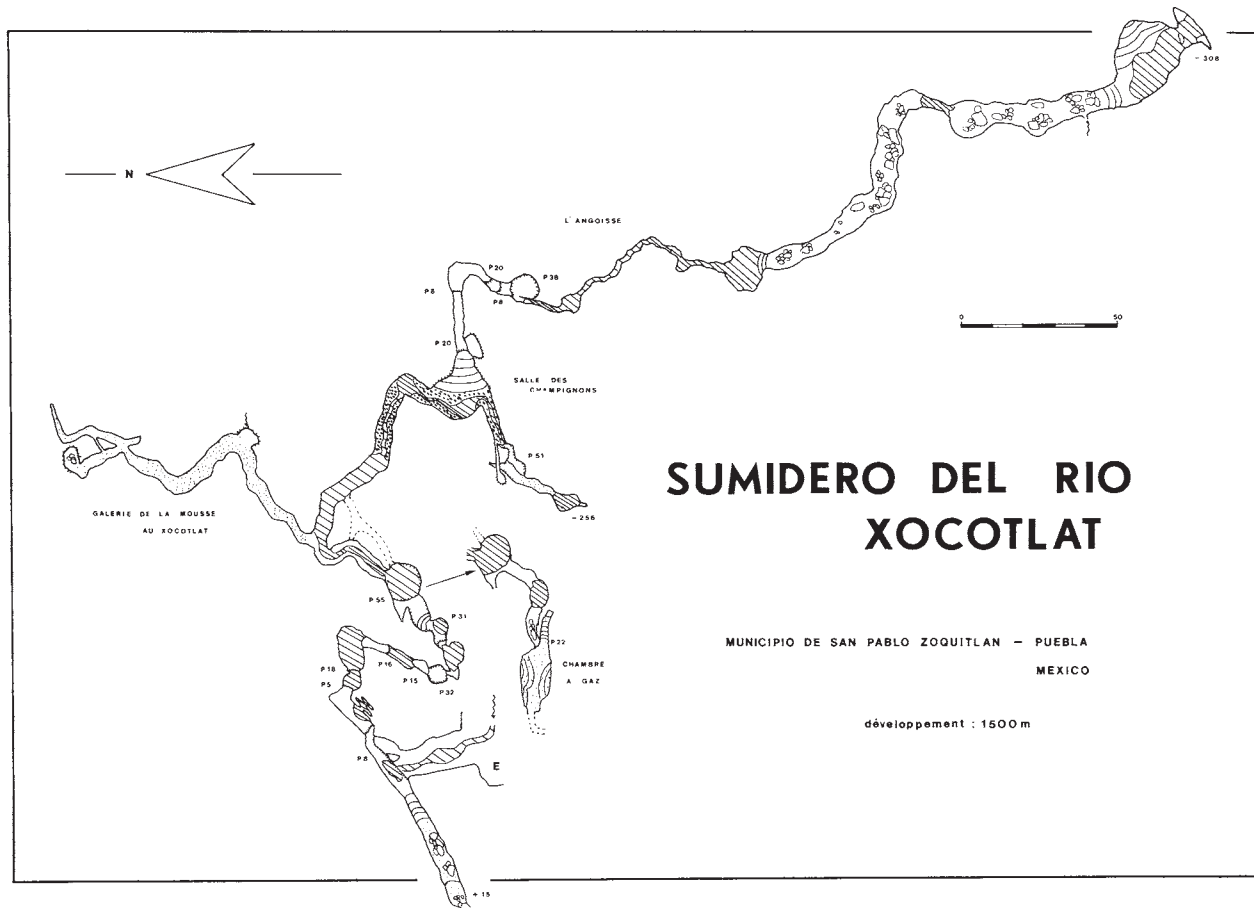
Other significant caves found in the area were Cueva del la Rana, located near Sumidero del Río Xocotlat, which was surveyed to a tight, muddy fissure and is 135 meters deep and 500 meters long, and nearby Sótano del Fuego, essentially a 45-meter-deep pit choked with dead animals. Depth potential for the river caves is about 700 meters, with the resurgences located about 9 kilometers to the east in the Tierra Caliente region. Locals report that many caves and deep pits exist in that area.

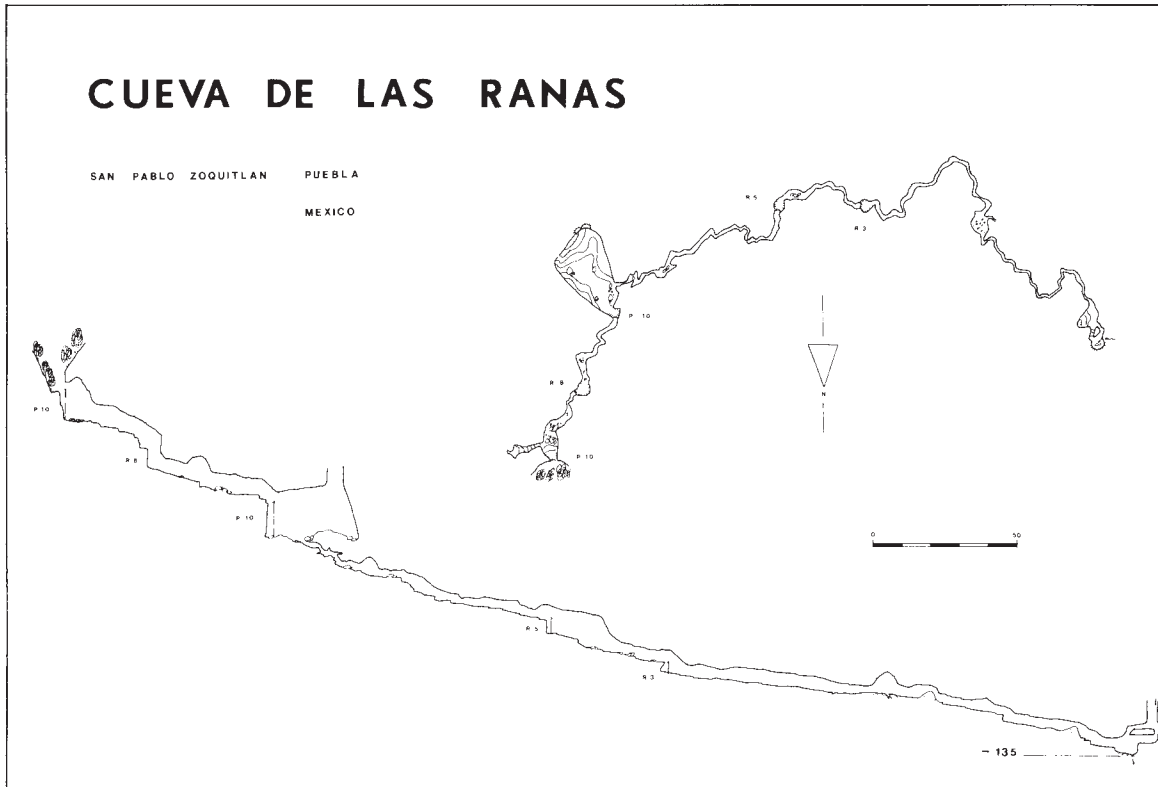
In 1983 the Belgians returned and investigated a mountain range northwest of Zoquitlán that goes up to 2500 meters elevation. The probable resurgences are to the southeast at 200 to 350 meters elevation, near the coastal plain. The resurgence at Coyolapa near Tlacotepec de Díaz flows from a large cave and is called Coyolatl by the locals. Expedition members were shown several sótanos in the area. A large, dry resurgence called Oztapulco is located one and a half hours' walk away. Above Oztapulco at 500 meters elevation is a large cave called Xantilco. The entrance is 80 meters in diameter, and daylight reaches 400 meters into the large descending passage, which was not explored to its end.

Also above Oztapulco a stream emerges from a 10-meter-diameter entrance called Cueva de Tamazcalco or Atlixicaia. Preliminary explorations indicated it is a promising cave.

The high karst at Alcomunga is at the contact of two limestones, one thinly bedded and the other more massive. Most entrances in the area are large, but passages are small.







A cave at Loma Bonita was 1 kilometer long and 100 meters deep. A large canyon flowing to the east sinks into a cave called Atl-comunik or El Sumidero. A huge log-jam 200 meters in effectively blocks the passage. Two small entrances on the canyon wall outside the cave blow air. Various other caves were found in the area, but all were blocked, usually by log-jams. The deepest was 70 meters.

Along the trail to San Miguel from Alcomunga, three 70-meter blind pits were explored. The locals know of many more caves, and there is rumored to be a large closed valley five hours' walk from Alcomunga where a stream enters a large cave at 2500 meters elevation.

Sources: Georges Feller, Speleo Flash, Guy Meauxsoone

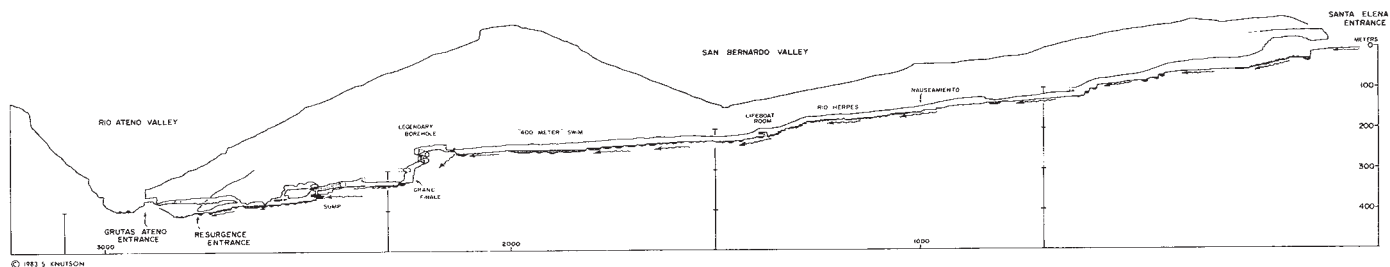
A group of cavers from the western U.S. continued work in Sumidero Santa Elena, near Cuetzalan, in January 1982. (See *Activities Newsletter* no. 12.) The survey was continued down a series of waterfall drops beyond the tenth drop. The



Stream canal in Sumidero Santa Elena. (Ernesto Garza)

SUMIDERO SANTA ELENA

XOCHITLAN. PUEBLA



twentieth drop was a narrow slot with the water rushing through it, so the explorers were forced to climb up the canyon to a rigging point beyond the waterfall. Farther along, the explorers encountered a pool with no apparent flow outlet and Jim Pissarowicz swam across and felt a whirlpool drain pulling him down!

On January 30, a push team consisting of Warren Anderson, Bill Liebman, and Dave Walker entered the cave. While they were in, it rained four centimeters, and a flood pulse of polluted water hit them as they were returning up Drop 14. In a panic effort they made it up to a high ledge, where they waited twelve hours for the flood to subside.

After the flood scare, they turned their efforts to the presumed resurgence cave in the Río Ateno valley. Using technical gear, Pissarowicz and Steve Knutson tackled a wall climb in two efforts, discovering the long-sought Legendary Borehole. This led to water, but they were not sure it was Santa Elena until they found a scrap of Blue Water rope jammed in a crack, flooded down from the previous year's rigging. A later 500-meter push got them close to the end of Santa Elena; then a last effort down from the top side sealed the connection. The resulting system was 6664 meters long and 400 meters deep.

A return expedition in 1983 continued mapping the resurgence section, increasing the length to 7642 meters.

Source: Steve Knutson, NSS News

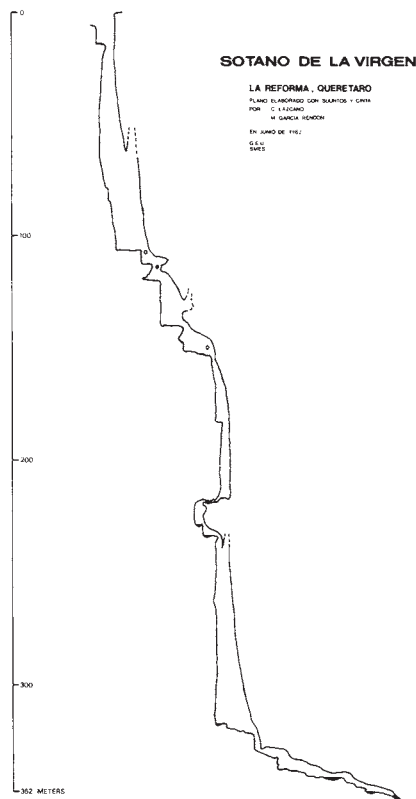
Querétaro

SMES covers resumed exploration in the Tilaco area in June 1982.

Sótano de la Virgen, discovered in October 1981, was surveyed. It is 352 meters deep with eleven drops. The entrance drop is 106 meters, and the last drop is 84 meters. A new discovery, Resumidero del Muerto, was entered only a short ways, but continues and is very promising. It is at the bottom of a large dolina and captures several arroyos.

The resurgence to 649-meter-deep Sótano de Tilaco has been dived by Sergio Zambrano. He followed a submerged horizontal gallery for 50 meters without seeing an end.

Source: Carlos Lazcano S.



San Luis Potosí

William Russell and John Gilliland visited the Tamapatz area in November 1982 to map Santaxol, a large cave 1 kilometer west of Muhuatl. The survey showed the cave to be 300 meters long and 46 meters deep. An interesting feature of the cave is a series of stalagmites carved in the shape of saints, which gave rise to the name of the cave. xol is cave or pit in Huastec.

Source: William Russell

In late December 1982 a large group of U.S. cavers hiked up to Sótano de Trinidad from a road that ends at Ahuayo, above Xilitla. Their goal was to see if Trinidad, which had been explored and mapped by Canadian cavers, could be pushed any deeper than 827 meters. While attempting to freeclimb the entrance drop, a Tennessee caver fell 10 meters and had to be taken to Valles for a cast. The fissure lead at the bottom of Trinidad was pushed only 3 meters deeper and then an overhead bypass was found that ended at -834 meters.

Three new caves were discovered in the Trinidad area. Cueva de Cerro Quebrado, 2 kilometers east of La Trinidad, was found to be 110 meters long with two chambers. Cueva de Cerro Pilón is 1 kilometer east of La Trinidad and also has two rooms, with a total length of 50 meters. Also explored was Sótano de la Milpa, a 72-meter-deep cave 1.8 kilometers east of La Trinidad.

Source: Jerry Atkinson

A group of seven Texas and Canadian cavers spent a week in mid-March 1983 exploring caves in the cone karst south of Tamapatz, in the Xilitla area. They were able to take advantage of a new road heading south from Tampaxal that may eventually connect to Tlamaya. Just over the crest onto the cone plateau, they located two caves, Cueva de Agua (-70 meters) and Cueva de Cabrera (-90 meters). Cueva de Agua is a complex phreatic maze with seven

entrances and more than 400 meters of passages. Locals obtain water from pools within, and among the aquatic fauna observed were pink, iridescent worms, 15 centimeters long and 1 centimeter wide. Cueva de Cabrera is a spacious, well-decorated cave 300 meters long.

One kilometer to the southeast, three caves were located in the Dolina la Reina. Sótano de la Reina has a large headwall entrance, but was found to be blocked by an organic debris "trashgrill" 20 meters down. Cueva de la Reina was pushed down a steeply dipping fracture to a blowing water crawl at -55 meters. At the bottom of the dolina the cavers explored Grieta de la Reina. A 10-meter vertical entrance chimney led to a nice 35-meter drop, followed by a dipping stoopway that led to a terminal lake at -60 meters.

Also investigated were several previously known caves near Tamapatz. Sótano de Muhuatl was rechecked, and it does not go. Nearby Cueva de Muhuatl was surveyed, and the survey begun in 1980 of Cueva de Oxtalja was completed. Oxtalja is 974 meters long and 196 meters deep.

Source: Jerry Atkinson

Yucatán

A branch of the Universidad de Yucatán is now actively studying the cenotes on the peninsula. Students of the Departamento de Acuacultura y Biología Marina, under the direction of Jorge Zamacona E., have been locating cenotes and studying aquatic fauna and pollution problems. A major project is the monitoring of two polluted caves in the city of Mérida. Divers have been exploring many cenotes, and have succeeded in connecting two cenotes three kilometers apart using tank-staging techniques.

Source: James Reddell

Mexico News is a regular feature of the AMCS Activities Newsletter, and its purpose is to report speleological events in Mexico not covered by full length articles. Contributions to this column, even if of seemingly minor importance, are welcomed.

Long Caves of Mexico

	meters
1. Sistema Purificación, Tamaulipas	51,170
2. Sistema Huautla, Oaxaca	24,074
3. Sistema Cuetzalan, Puebla	22,432
4. Nita Nanta, Oaxaca	9,030
5. La Grieta, Oaxaca	8,782
6. Atepolihuit de San Miguel, Puebla	7,700
7. Sumidero Santa Elena, Puebla	7,642
8. Sótano del Arroyo, San Luis Potosí	7,200
9. Actún Kaua, Yucatán	6,700
10. Sumidero de Jonotla, Puebla	6,381
11. Sótano de Las Calenturas, Tamaulipas	5,877
12. Gruta del Río Chontalcoatlán, Guerrero	5,827
13. Gruta del Río San Jerónimo, Guerrero	5,600
14. Grutas de Juxtlahuaca, Guerrero	5,098
15. Cueva del Nacimiento del Río San Antonio, Oaxaca	4,570
16. Sótano de la Tinaja, San Luis Potosí	4,502
17. Sótano de Japonés, San Luis Potosí	4,500
18. Sistema San Andres, Puebla	4,471
19. Sótano del Río Iglesia, Oaxaca	4,206
20. Sistema Zoquiapan, Puebla	4,107
21. Sima del Borrego, Guerrero	4,007
22. Sótano de Agua de Carrizo, Oaxaca	3,748
23. Nita Nashi, Oaxaca	3,524
24. Veshtucoc, Chiapas	3,500
25. Cueva del Río Jalpan, Querétaro	3,440
26. Actún Xpukil, Yucatán	3,353
27. Cueva de la Laguna Verde, Oaxaca	3,350
28. Sumidero Yochib, Chiapas	3,316
29. Cueva de El Chorreadero, Chiapas	3,280
30. Sumidero La Joya, Guerrero	3,100
31. Atepolihuit de Nauzontla, Puebla	3,066
32. Sistema de Montecillos, San Luis Potosí	3,022
33. Sótano de Huitzmolotitla, San Luis Potosí	3,002
34. Sótano del Río Coyomeapan, Puebla	3,000
35. Sótano del Tigre, San Luis Potosí	3,000
36. Sumidero San Bernardo, Puebla	2,967
37. Boca del Río Apetlanca, Guerrero	2,750
38. Cueva Ayockal, Puebla	2,702
39. Actún Loltun, Yucatán	2,682
40. Sistema Santa Lucia, Puebla	2,500
41. Cueva de Juan Sanchez, Oaxaca and Veracruz	2,493
42. Sima de la Cruz Verde, Puebla	2,301
43. Grutas de San Cristobal (Rancho Nuevo), Chiapas	2,250
44. Xocomanetlán, Guerrero	2,223
45. Grutas de Estrella, Guerrero	2,100
46. Sumidero de Atecarla, Puebla	2,005
47. Sótano de Vasquez, Tamaulipas	2,000
48. Sótano de Yerbaniz, San Luis Potosí	1,980
49. Grutas de Tenextepec, Puebla	1,920
50. Cueva de la Mantilla, Michoacán	1,900

Deep Caves of Mexico

meters

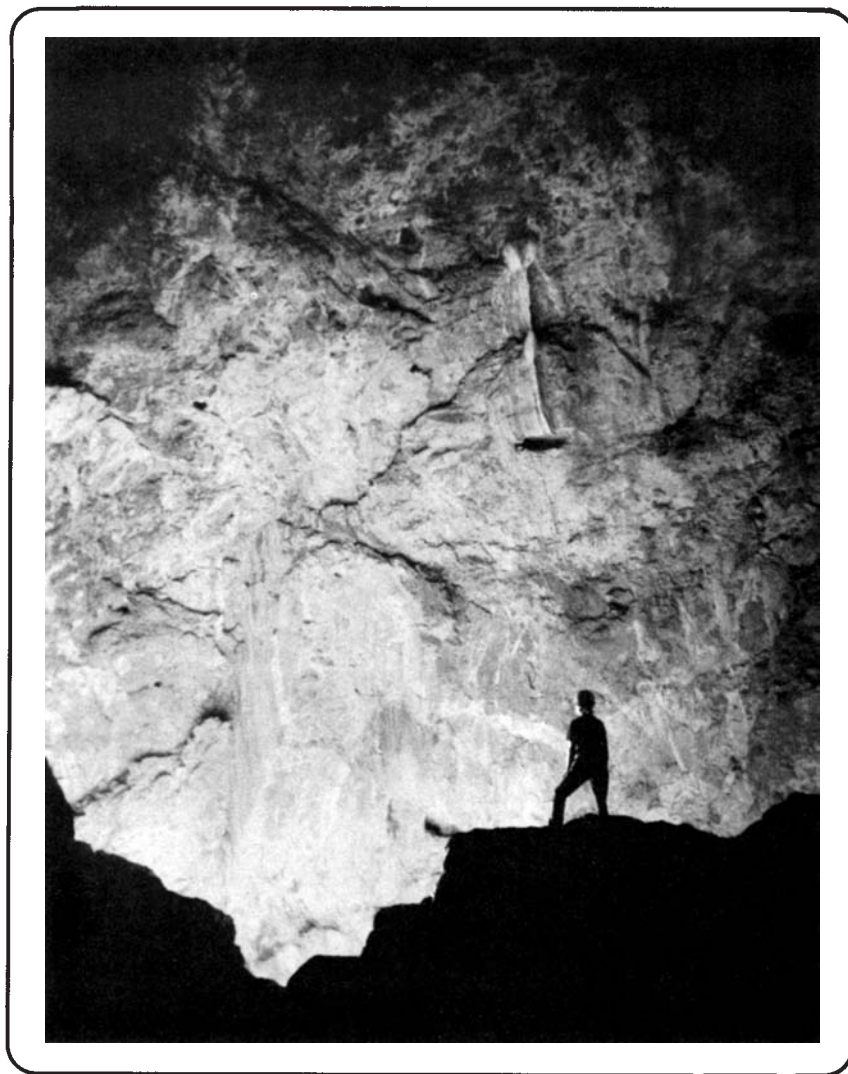
1. Sistema Huautla, Oaxaca	1,246
2. Nita Nanta, Oaxaca	1,030
3. Sistema Purificación, Tamaulipas	895
4. Sótano de Agua de Carrizo, Oaxaca	836
5. Sótano de Trinidad, San Luis Potosí	834
6. La Grieta, Oaxaca	734
7. Sótano de Tilaco, Querétaro	649
8. Nita Nashi, Oaxaca	641
9. Cueva de Diamante, Tamaulipas	621
10. Nita He, Oaxaca	594
11. Sistema Cuetzalan, Puebla	587
12. Sótano de las Coyotas, Guanajuato	581
13. Sótano del Río Iglesia, Oaxaca	531
14. Sótano de Nogal, Querétaro	529
15. Sótano de las Golondrinas, San Luis Potosí	512
16. Hoya de las Conchas, Querétaro	508
17. Sótano del Buque, Querétaro	506
18. Hoya de las Guaguas, San Luis Potosí	478
19. Cueva de San Agustín, Oaxaca	461
20. Sótano de Ahuihuitzcapa, Veracruz	455
21. Sótano del Barro, Querétaro	455
22. Sótano Itamo, Veracruz	454
23. Sótano de Tlamaya, San Luis Potosí	454
24. Cueva de La Peña, San Luis Potosí	448
25. Sumidero Santa Elena, Puebla	400
26. Atepolihuit de San Miguel, Puebla	399
27. Sótano de la Joya de Salas, Tamaulipas	376
28. Sótano Tomasa Kiahua, Veracruz	374
29. Sótano de la Virgin, Querétaro	352
30. Cueva de El Chorreadero, Chiapas	345
31. Cueva de Xocotlat, Puebla	339
32. Grutas de San Cristobal, Chiapas	330
33. Sótano de Los Hernandez, Querétaro	330
34. Cueva de Santa Cruz, Oaxaca	327
35. Sumidero del Río Xocotlat, Puebla	323
36. Sótano de Seis Segundos, Oaxaca	323
37. Sotanito de Ahuacatlán, Querétaro	320
38. Hoya de Zimapan, San Luis Potosí	320
39. Sumidero de Atikpak, Veracruz	319
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41. Sótano de Jabalí, Querétaro	308
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44. Sótano de los Monos, San Luis Potosí	291
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Explorations In The

Purificación Area - 1982

Sistema Purificación Passes 50 Kilometers

Peter S. Sprouse



Diffuse daylight illuminating the passage wall inside Cueva de Infiernillo. (Peter Sprouse)

In the spring of 1982 the Purificación Project faced the challenge of pushing leads in the most remote and promising section of Sistema Purificación: the Southbound Borehole, a linear south-trending lead 600 meters below and 5 kilometers from the Cueva del Brinco entrance. Due to the difficulty of putting in camps by this route, an effort was made to make a direct connection between the northern part of the Borehole and the Infiernillo section of the system, which would provide considerably easier access for extensive pushes. Good progress was also made in various sections of Infiernillo during a seven-day occupation of Camp I. A return trip to Infiernillo's Camp I in November 1982 continued work in that section of the system. New passage totaling 5635 meters was surveyed in 1982 to make the cave 51,170 meters long.

Initial Activities

David Honea and Jeanne Williams arrived in the project area in western Tamaulipas in early March. While they prospected for high entrances near Rancho Nuevo at 2500 meters elevation, Jerry Atkinson, Terri Treacy Sprouse, and I arrived on March 9. Jerry hiked up from El Olmo at the foot of the mountains, up through the desiccated shale and conglomerate beds.

Among the first caves investigated were some pits David and Jeanne had discovered near Rancho Nuevo, including Pozo de las Rudistas (-80 meters) and Pozo del Arrecife (-50 meters). We also looked at Cueva de California, a locally well-known cave that might be termed the Carlsbad of the area. First located by Charles Fromén and Mike Connolly in the early seventies, California is a complex phreatic chamber, profusely adorned with long stalagmites, columns, and flowstone slopes and domes.

During a brief visit to Cueva del Vandalismo near the highest portion of the Mesas Juarez, David made a spectacular discovery, a new genus of blind scorpion. This new arachnid, as yet unnamed, represents the first time two different blind scorpions have been found in one area, and it is also the only one known to exist at such a high elevation, 2640 meters above sea level.

After our return to base in

Conrado Castillo, Jim Pisarowicz arrived, having driven up alone, narrowly missing a boulder crashing down the mountain. We were now ready to begin work on our primary goal in Sistema Purificación, the exploration of the remote central portion of the system. On March 20, David, Terri, and I set off from the Brinco entrance to attempt a connection from the Southbound Borehole to the Wind Tunnels area south of the Netherhall. If this could be done, it would be practical to put in a camp in that section via the Infiernillo entrance. We shed our wetsuits at the end of the World Beyond and proceeded to the first of our leads in the Southbound Borehole. Several leads had previously been noted that appeared to trend north, parallel to the Borehole. The first one we investigated took off from the east side, and seemed well situated to head toward the Wind Tunnels section of Infiernillo. This passage went to a north-south junction, where we continued north to a lake, Shamrock Shores. Although now without a wetsuit, David waded ahead over 300 meters until swimming was necessary. Retreating back to the north-south junction, we explored south. After several hundred meters we came out in the Southbound Borehole again, out of another of the north-trending leads we'd had hopes for, thereby eliminating that one. Crossing over to a northward lead off the west side of the Borehole, we pushed a lead off of Fantasia that became too tight after 100 to 150 meters. So we left the cave not very encouraged about finding a dry connection route.

A Week Underground

Our next project was a week-long stay at Camp I in Cueva de Infiernillo, at the northern end of the system. Our goal was to work the many leads accessible from Camp I, as well as continue to look for a route to the Southbound Borehole, this time from the Infiernillo side. The six of us traveled down from Conrado Castillo in our two four-wheel-drive trucks to the end of the logging road. We descended the familiar palmetto-lined path to the Infiernillo arroyo and then went up to the gaping cliff entrance. The cliff ascent and hike in to camp were routine, and soon we were settled in,

on new sands deposited by the previous summer's floods.

Day one--We all set off together to form two survey teams in the western Confusion Tubes. After traveling together up the Complex Dome and down the Misty Borehole, Jerry, Jim, and Terri split off to descend west into the Gnome Springs area. David, Jeanne, and I went a little farther south to some tubes going off of the beginning of the Manifest Destiny Passage. These we named the Typical Tubes, and we surveyed only 138 meters before they shrank down and cheesed out. We then turned to photography, with more spectacular results. Jerry's team investigated a hole leading down off the Gnome Springs area that headed west, a promising direction. Their lead soon ended up at an unclimbable dome, but fortunately a low, wet passage, the Banana Tube, led to a continuation beyond the dome. This was fine walking passage, dubbed Napoleon's Borehole; Jim had a habit of sticking his gloves in his helmet band while surveying, giving him a crest reminiscent of Napoleon's guards. The team finished the day in walking passage with good airflow, heading northwest. Their survey was 376 meters, making the cave 45,989 meters long at the end of the day. Would this lead take us to the long-sought-after western extension, beyond the sumps, or turn fickle, as other leads had?

Day two--The next day Terri, Jim, and I returned to find out. Only a short way down virgin passage the cave made a 180-degree bend to the left, then ascended a rubble slope to an overhung climb. I got up this with a boost, only to find a sheer, smooth-walled dome, the source of all the air. Bummer! On the way back we tied in the loop down the dome over the Banana Tube. Jerry, David, and Jeanne spent the day cleaning up minor tubes in the northwest Confusion Tubes near Luncheon Junction.

Day three--Terri led David and Jeanne in the first survey of the Cobble Leads, an interesting series of drains underneath the Main Passage that had been previously explored, but not mapped. Over 300 meters of passage was surveyed. The rest of us headed to Ithilien, the southernmost part of the western Tubes. At the dome-climb leading into it, Jerry rigged a permanent ladder. Above the ladder we continued through known

passage for several hundred meters, first through a deeply incised and sinuous canyon, and later up a small calcite-floored streamway. As we mapped south, we wondered if we would intersect the lost Isopod River, which ends in an undived sump. Our survey took us through a maze of many loops, beyond which was a tricky overhung climb. Once over that, the way became larger. We called this the Hellenic Borehole. The borehole got bigger through a few twists and turns and then split into two leads; we took the left. We were soon confronted by a balcony looking into blackness. A chimney crack on the right side took us down into a room with huge blocks in the middle. Shooting down the passage ahead from the top of one of the boulders, we heard the familiar babble of a river. A few more excited shots brought us to the water, a confusing spot.

Right where we encountered the river, it sank into the floor in breakdown. Upstream we only went 20 meters to a large lake. Jim stripped down and swam across to the far shore so we could do a final 30-meter shot. He then explored on up a flowstone slope, then across another lake to a breakdown borehole, 200 meters in all. This seemed likely to head for the known downstream sump of the Isopod River.

From the Y junction before the river, now named Babylon for its voice, I explored the right-hand passage. It was a good going walking passage, so we broke out the survey gear again. After 100 meters the passage widened into Fissureland, a large chamber with a sand and breakdown floor. At the far end we went left, and at the next choice dropped down into a lower level. This we named the Northwest Passage, for lack of a better name. After a gradual slope for 100 meters, it split up into small tubes, where we halted.

Day four--Terri, David, and Jeanne returned to the Cobble Leads area to finish up, netting 150 meters more passage. Jim and I mapped in various leads in the Lone Bat Passage off the East Loop. The southernmost of these, the Bat Mummy Passage, was a nice tube that went 100 meters to a blowing choke. Back at camp that night we tallied the cave length at 47,776 meters, then gorged on a speleo-cheesecake.

Day five--This was the day for our long trip beyond the Netherhall to search for a way to the South-

bound Borehole. Jim, Terri, and I first searched along the south skirt of the Netherhall breakdown mountain, without turning up any leads. Continuing south into the Wind Tunnels, we rechecked various leads that had been partially explored in 1978 during the search for the original Infiernillo-Brinco connection. We looked again at a dome climb above the Foggy Mountain Breakdown and determined that it did indeed require technical climbing gear. A lead off to the right of the Wind Tunnels gradually got lower and lower, lacking much promise. Moving farther south, we pushed a passage north off Robert's Revenge that headed toward the previous lead, but it also pinched.

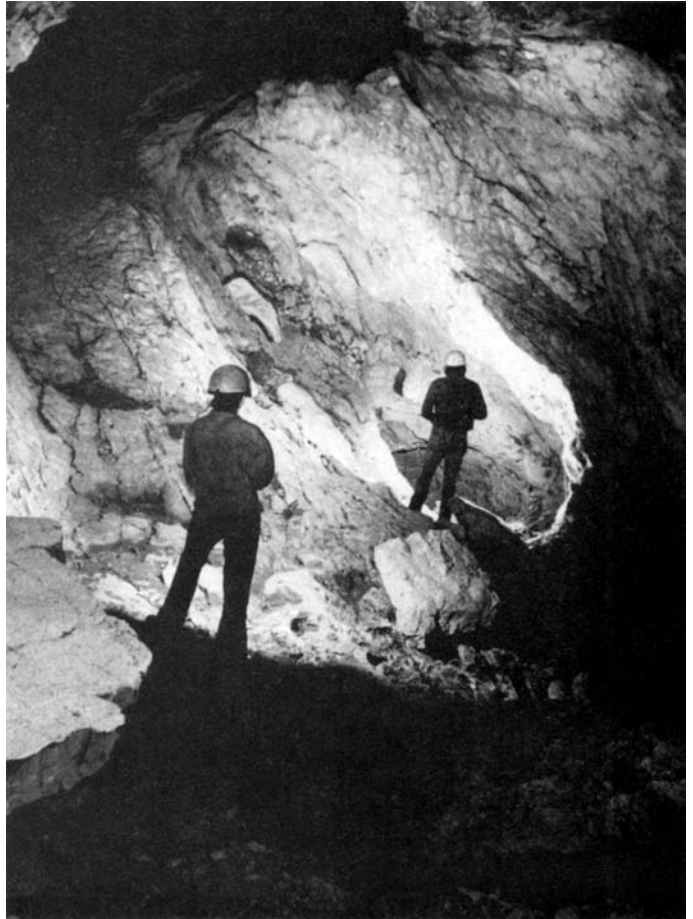
By now we were so far south that we were beyond the probable connection area, considering passage trends. Thus we had been thwarted at both ends. Meanwhile Jerry, David, and Jeanne were able to map 275 meters of passage off Lost Pit in the Tubes, tying in near the Río Shumate.

Day six--For our last full day inside, we all took on non-surveying projects. Jerry and Jim measured water scallop sizes on passage walls for a flow study. The rest of us took photographs in a neglected area of the cave, from the entrance to Camp I.

Reviewing our efforts of a week underground, we found that we had surveyed 2338 meters of passage, as well as taken many photographs to illustrate the cave. And we had solved a few more mysteries in an endless underworld.

High Karst

Our return to the land of sunshine brought such shocks as a bath and a volleyball game, in which the local boys had no trouble beating us. A further day of R and R, and then we were ready for action again. A close look at aerial photos revealed two solution areas higher on the mountain to the south that lined up with the system trend and could be infeeders. To reach our first objective, we descended the east slope of the ridge down a steep drainage valley. However, the arroyo did not lead to a cave, but a mine--the Mina la Lolita. April fools! A look into this revealed several hundred meters of tunnels with rotten timber bridges, but few natural solution voids.



An upper level passage above the Complex Dome in the western Confusion Tubes. (Peter Sprouse)

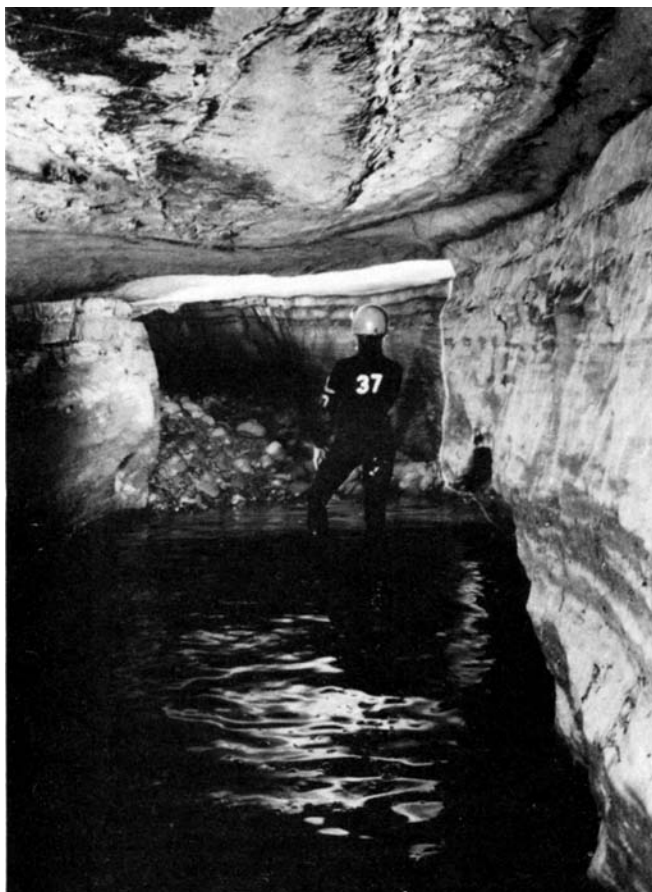
When Jerry, Jim, and I climbed back up the ridge to our camp, we discovered a promising cave entrance not far from our vehicles. Upon climbing down the entrance slope under a stalactitic overhang, we encountered a drop in a wide fissure. We brought out the survey gear, and Jerry descended the pitch to the top of another. At that point we decided to return to the trucks for lunch and more rope. The second drop went to a flowstone ledge followed by a 22-meter pit. Our last rope got us down a 6-meter-deep fissure. We could only look down the next drop, apparently 15 meters deep with a hint of airflow.

We had descended many blind pits in the high karst of Purificación, and we knew better than to get excited about this one yet. We were only down 80 meters in Cueva de Abril, as we called it, and another 100 meters of depth was a tough barrier for

this area. On April 2, David, Jerry, and I continued the push, while the others tied in nearby pits with a surface survey. The fifth drop turned out to be 14 meters, followed by a short 4-meter pit. We tied our two remaining ropes together to rappel The Hot Patootie Pitch, 20 meters to a blind floor, dead bottom at -115 meters. Pushing side leads on the way out produced nothing but pinches.

Pushing South

Possibilities for putting a camp in the central part of Sistema Purificación in the remainder of the season looked poor, so we decided to at least try one long push from the Brinco entrance to try to map south in the Southbound Borehole. David, Terri, and I went into Brinco on the morning of April 4, in wetsuits until we passed the World Beyond. At the south-most point of the borehole, we picked up the survey at IK37. After



Flat bedding planes strongly influence passage configurations in Cueva del Tecolote. (Peter Sprouse)

a few shots in stooping passage, we could hear a flowing stream ahead. We popped up into a decorated junction room, the Fusion Chamber. Here a new river cascaded down flowstone tiers. Both directions in the Tokamak River led to deep swims, and upstream a fine flowstone waterfall could be seen. Since we were restricted to drier leads, David climbed into a high lead that paralleled the upstream river. After 60 meters water stopped him, but several leads could be seen continuing. I located another high and dry lead that went north, then turned south, where we wanted to go. The Irish Extension took us on a level southward course, becoming so straight that it evolved into the Beeline Borehole. But then our lead porpoised through a few S-bends and collapsed into a massive boulder choke, the Redrock Breakdown. A thorough check revealed a lot of airflow, but no way on. We were disappointed that our lead ended, but we had gained 639 meters of survey and extended the southern limit of the system by 300 meters.

We had been underground 25 hours by the time we had finished the journey to the entrance, six kilometers away and 600 meters higher.

Farther Afield

David and Jeanne left the area on April 6, and the four of us who remained moved camp up to the high karst of Rancho Nuevo again, near Cueva de California. We spent two enjoyable days mapping the well-decorated cavern. In the beautiful pinnacles and dolinas nearby, Terri had the fortune of spotting an ocelot.

A steep mining road drops down the east side of the Rancho Nuevo ridge towards Los San Pedro. Taking this route, we set up camp for a few days near Cueva del Tecolote, a large arroyo cave over a kilometer long and still going. The water levels were down from our previous visit in 1981, so we found that a former low airspace at the end of the cave was now walking passage. We followed the cobbled streamway to an 8-meter handline drop, where we used our last rope. We were able to map several hundred meters more before being halted by a 15-meter drop. The cave goes, but enthusiasm was low due to the highly polluted water. Tecolote takes the full drainage of Los San Pedro, including its latrines.

We checked into the prospects of several valleys to the south of Tecolote along the eastern cliff escarpment overlooking the coastal plain, but turned up no caves. Jim and Jerry drove on down the mountain to head home, while Terri and I drove the 37 kilometers back to Conrado Castillo.

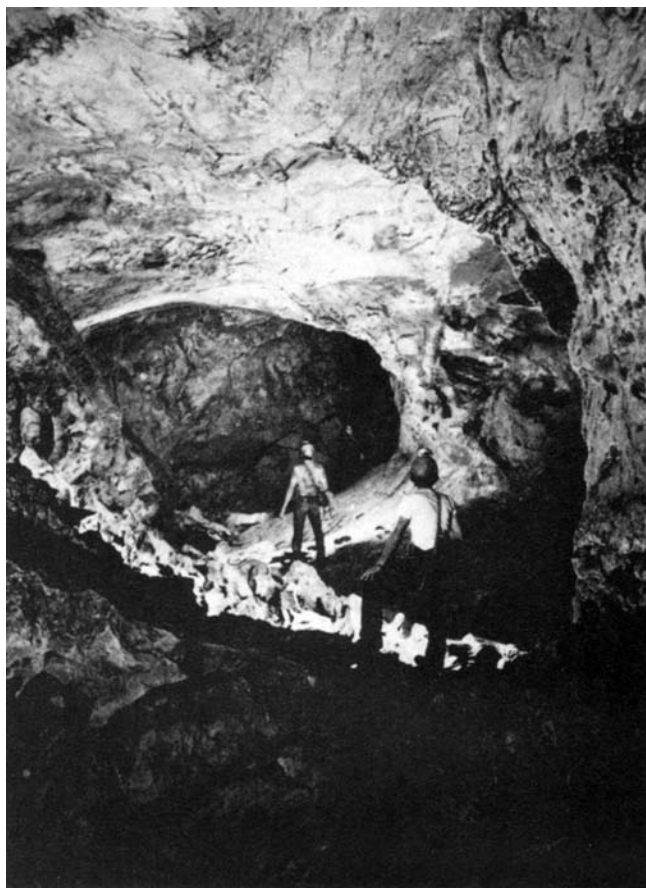
Spring Wrap-up

The two of us (Terri and I) spent another ten days in the mountains. In addition to some surface survey, we mapped in various caves, including Sistema Purificación. The survey of the dusty Holes-in-the-Floor in the Historic Section of Brinco increased the length of the system to 48,884 meters, with 3412 meters having been mapped during the spring project. In Cueva del Borrego, a maze cave south of Brinco, we completed another 203 meters of survey, making that one 564 meters long. Two other caves surveyed were Cueva Plana, a 60-meter-long cave near Galindo, and Pozo del Contrabando, a 29-meter drop near Puerto Contrabando.

Fall 1982

A contingent of thirteen cavers left Austin on November 19 with the goal of putting a five-day camp in Infiernillo. We climbed the mountain in Mark Minton's four-wheel-drive bus and my Toyota, and set up camp on the Infiernillo road. A little chain-saw work got us down to the roadhead. After completing the hike to the cave, we rigged an extra rope so cavers could ascend while we hauled up packs on the zip line. Soon all thirteen of us found our sandy niches amongst the boulders of Camp I.

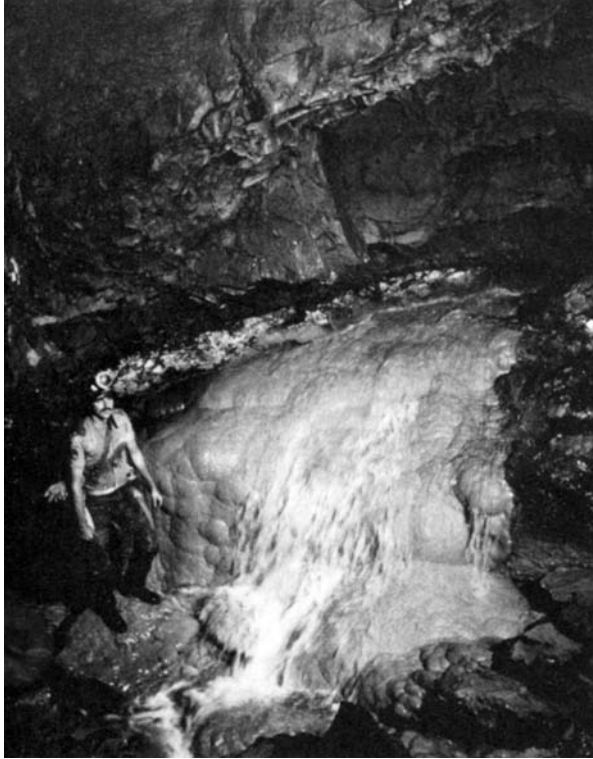
Day one--We decided on our first day to push our primary wetsuit leads. Jerry Atkinson led a team including Sheila Balsdon and Mark to push the river discovered the previous spring in Babylon. Four others, Jim Feely, Mike Kilpatrick, Bill Mixon, and Rich Rohwer, went along as far as the river, then took photos coming back. Jerry's team successfully surveyed upstream through large passage to the expected sump, which undoubtedly connects to the Isopod River. Their exploration took them through a borehole of swims and breakdown mountains. Meanwhile, their dry contingent had trouble



Boreholes of Babylon. (Peter Sprouse)

locating the way back through the Confusion Tubes and waited a few hours for the wet team to join them. The river survey netted 442 meters.

Two other wet teams set off to push the Jersey Turnpike, a 1500-meter-long passage that had been explored past a 150-meter swim in 1981. Peter Keys and Terri Sprouse surveyed with me, and Dale Pate had Roy Jameson and Patty Mothes on his team. Our two teams began a leapfrog survey heading south. Dale's team leaped ahead, and after 200 meters we tied into their survey at the edge of a lake they had mapped to a sump. I located a sinuous canyon leading to an upper level that continued south. While the other team mapped the canyon, we began in the upper level. Our passage widened into the Hank T. Hallucination Chamber, after which we abandoned our level for a higher, bigger one, the Unicorn Borehole. This led shortly to a steep wall climb and an upsloping passage going 180 degrees around to the left, back to the north. Peter Keys made the climb up 15 or 20 meters and it went,



The Río Babylon cascades down a flowstone falls to disappear in breakdown. (Peter Sprouse)

but since the other team had already leapfrogged up the other lead, we mapped up to them. At a junction, we followed a high fissure until it got too steep, then joined the others as they tied a loop into the Unicorn Borehole.

Back at camp we tallied our survey at 762 meters, more than enough to push the cave over the 50 kilometer mark--50,116 meters to be exact. It had been nine years since the survey in Brinco had been initiated, seven years since the birth of the Proyecto Espeleológico Purificación.

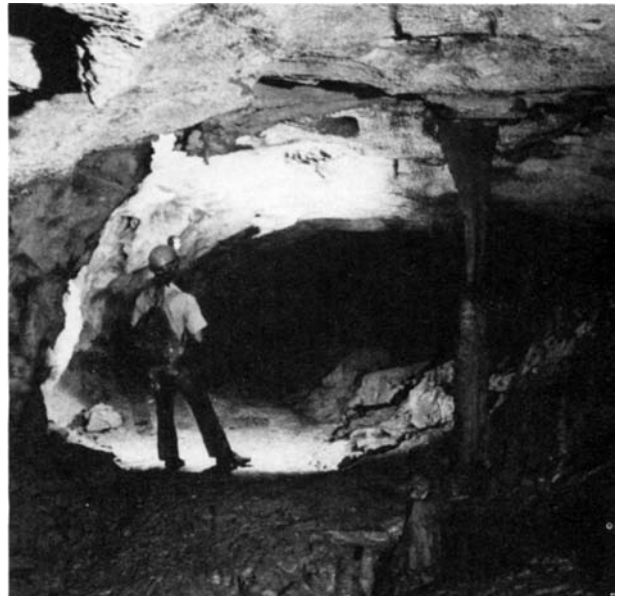
Day two--This was a photography day, with the West Loop of the Main Passage being especially well covered.

Day three--Armed with the latest in pyrotechnics, Jerry, Mark, Sheila, Jim, and Rich set off for Moria, where a blowing base-level breakdown choke held promise of a westward continuation of the system. But they found the level below the 15-meter drop flooded due to the high level of the Black Lagoon sump. So they crossed a traverse line left in 1979 to a section of passage previously explored by Peter Keys. They surveyed 150 meters of passage in this area, which

connects back into the beginning of Moria via the Sand Slide, a normally impassable sand sump. Reaching the far side of the sump by recrossing the traverse, they surveyed 50 meters into a lead called Acupuncture Crawl. Mark explored 50 meters farther, and it continued as a grim, blowing crawl.

Two teams consisting of Roy, Patty, and me and Dale, Terri, and Peter traveled through the Tubes to Babylon to map in leads off the Fissureland area. After photographing our way up there, Roy, Patty, and I pursued the unexplored upper-level lead in the Northwest Passage. We surveyed 250 meters in a gradually shrinking passage, stopping at a tube drop. The others mapped a loop to the Hellenic Borehole, and down in a fissure called the Whale's Belly.

Day four--For our last day in the cave we split into four separate teams. Terri, Peter, and Jerry mapped a lead off the Bucket, connecting it into the Río Shumate in the south Confusion Tubes. Not far away were Dale, Patty, and Roy, who mapped a hole in the floor of the Balcony Borehole that tied into the labyrinthine Octopus Tube. In a third minor connection east of the tubes called Mushroomland, Bill, Mike, Rich, and I tied in a pit lead off the D Survey into a side passage off of the Airport, an area explored in 1978. Meanwhile Mark, Sheila, and Jim traveled back to the Camp II area to push the Windsump Passage.



The Upper Northwest Passage, Babylon area. (Peter Sprouse)

They dematerialized a boulder blocking the way and pushed on through breakdown to discover a stoopway continuing, with a good wind.

Together our last day's surveys made the Sistema 51,170 meters long, with 2223 meters of that having been mapped that week.

Post-Camp Activities

The next day, November 26, we went out of the cave and filed down the boulder-filled arroyo with heavy loads. Mark stepped on the wrong rock and triggered a collapse that pinned his ankle. It took nearly all the crew to free him. Fortunately, he was able to walk on, and we spent the night in Galindo, where we bathed in the stream. The bus drove down the mountain and back to Texas, but Jim, Terri, and I stayed on for awhile. We spent the next two days completing the surface survey from Brinco to Infiernillo, often to the sounds of a large flock of parrots circling above the pines.

We drove south to the high point of the ridge, the fire tower 2800 meters above the sea. It was exceptionally clear, and we were able to see Lake Guerrero to the east and Highway 101 to the south. The next day we surveyed 80-meter-deep Sótano de la Torre, explored by members of the Pan American Speleological Society in 1973. This high-altitude pit was a cold 9 degrees Celsius at the bottom. After that we made the long drive down to the coastal plain, food, and beer.

We had a few more days in Mexico, and one of our goals was to rent a plane and fly over the area. We visited the airport and were unable to find a pilot available, but made tentative arrangements for two days later. Then we headed west on Highway 101 to San Antonio, then north 30 kilometers on a dirt road to El Carrizo. This is along the Río Chihue, and we had a report of a cave there called El Sótano, said to be the resurgence of 1500-meter-long Cueva del Tecolote. We found out that William Russell and John Gilliland had visited the cave a week before us. El Sótano proved to be a classic wet-weather resurgence sloping down to a sump after 100 meters.

On our return to Ciudad Victoria, Jim became ill, and since the sky was not clear, we gave up on flying and



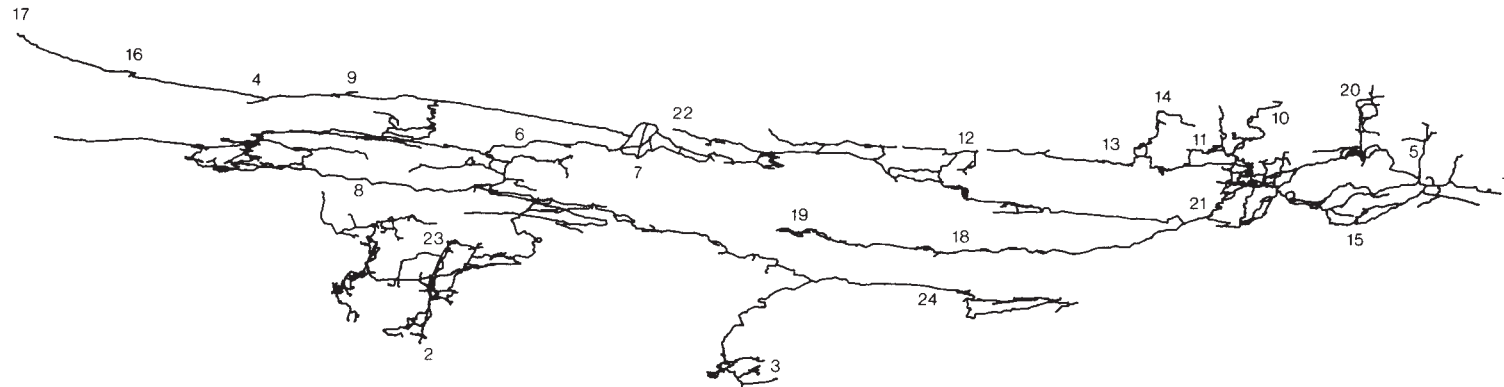
The D Survey. (Peter Sprouse)

headed north, wrapping up another good year in the Purificación mountains.

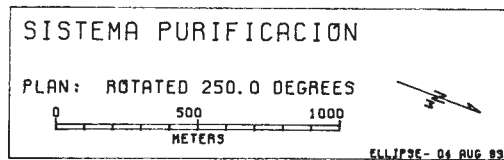
Participants in the 1982 Purificación Project were:

Jerry Atkinson	Bill Mixon
Sheila Balsdon	Patty Mothes
Jim Feely	Dale Pate
David Honea	Jim Pisarowicz
Roy Jameson	Rich Rohwer
Peter Keys	Peter Sprouse
Mike Kilpatrick	Terri Sprouse
Mark Minton	Jeanne Williams

**PROYECTO
ESPELEOLÓGICO
PURIFICACIÓN**



length: 51,170 m
depth: 895 m



KEY TO SISTEMA PURIFICACION MAP

- | | |
|----------------------------------|------------------------|
| 1. Cueva de Infiernillo entrance | 13. Babylon |
| 2. Cueva del Brinco entrance | 14. Northwest Passage |
| 3. Sumidero de Oyamel entrance | 15. Mushroomland |
| 4. Southbound Borehole | 16. Fusion Chamber |
| 5. Camp I | 17. Redrock Breakdown |
| 6. Wind Tunnels | 18. Jersey Turnpike |
| 7. Netherhall | 19. Unicorn Borehole |
| 8. World Beyond | 20. Moria |
| 9. Fantasia | 21. Bucket |
| 10. Napoleon's Borehole | 22. Windsump |
| 11. Ithilien | 23. Holes-in-the-Floor |
| 12. Isopod River sump | 24. Dragon River |

Exploraciones en Purificación

El mayor objetivo del Proyecto Purificación 1982 fue el de explorar los pasajes más remotos de la cueva, el Southbound Borehole: un pasaje 600 metros abajo de la entrada de Cueva del Brinco y 5 kilometros distante de esta.

Un campamento de siete días se realizó en el Infiernillo para tratar de encontrar la conexión entre Infiernillo y el Southbound Borehole como también para efectuar topografías en otra áreas del Infiernillo. Ninguna conexión fue encontrada, pero el mapeo de la cueva incrementó la longitud del sistema por 5635 metros más.

Un viaje fue hecho a la entrada del Brinco para tratar la conexión del Infiernillo con el Southbound Borehole pero el intento fue infructuoso otra vez. El propósito del siguiente viaje será el de extender la exploración en dicha zona. Un nuevo río fue encontrado, y otro pasaje seco fue topografiado durante 600 metros con una buena corriente de aire hasta un derrumbe. Otros proyectos incluirán el chequeo de los karst más arriba para posibles conexiones. Se localizaron varios tiros pero no conectaron desafortunadamente al sistema. El mapeo también continuó en otra cueva "El Tecolote" cuya exploración promete. En el otoño de 1982 debido a la exploración de otros pasajes. La longitud del sistema se incrementó a 51.170 metros.

México's second kilometer deep cave



HUAUTLA 82-83

Nineteen eighty-two was going to be the year of the connection in Huautla. The previous year's exploration (see *AMCS Activities Newsletter* no. 12) had brought Nita Nanta tantalizingly close to Li Nita. That connection would make the Sistema Huautla second deepest in the world, at -1370 meters. In addition, we had new hope for the long-sought triple connection of Sótano de San Agustín, Sótano de Agua de Carrizo, and La Grieta. Thus a high-spirited group left Austin on March 25. On board the school bus were Darlene Anthony

(Tennessee), Mike Doe (Arizona), Ed Holladay (Tennessee), Chris Kerr (Tennessee), Hal Lloyd (Texas), Mike McWhirter (Texas), Mark Minton (Texas), Lisa Wilk (Texas), and Ted Wilson (Indiana), along with virtually all of the supplies for a six-week stay in Huautla. Nine days later a second crew composed of Pam Duncan (Tennessee), Richard Schreiber (Georgia), Jim Smith (Tennessee), Bill Steele (Texas), and Dale Weisman (Texas) left from San Antonio. The final members of the expedition, Chris Albers (Wyoming), Scott Davis

(Arizona), Doug Powell (Arizona), and Rick Rigg (Idaho) were to join us in the field a few weeks later.

Only twenty-four hours south of Austin, just past San Luis Potosí, site of another Huautla expedition mishap (see *AMCS Activities Newsletter* no. 10), a loud knocking sound and loss of power signaled trouble with the bus. After an exciting tow back to town, complete with three-way passes on hills and other thrills of Mexican driving, a mechanic delivered the verdict: blown engine. We watched in awe as the engine was removed from the bus and completely disassembled on the spot. To make a long story short, it could not be rebuilt, and used engines were not available. We decided half of the team would go ahead to Huautla as an advance crew to obtain permission, set up a field house, and begin rigging. The rest of us would obtain a new engine in the U.S. and bring it down for installation. Remarkably, this plan proceeded relatively smoothly, and the bus was rolling again with only eight days lost. The advance crew found local relations quite good, but was shocked to find that an equipment cache that had been safely left in a local cave several prior years had now been vandalized and completely destroyed. They were thus unable to rig, and we were faced with critical shortages of carbide, rope, and bolts. A phone call back to the states caught the second crew in time for them to bring replacements for some of the lost gear. They arrived, conveniently, one day after the bus.

The Kaliman Wall

With the bad luck behind us, cave exploration got under way quickly. Nita Nanta was top priority. Familiarization trips were made to rig and stock provisions for a camp in the large chamber known as the Football Stadium at the end of the Naranja Passage, at -635 meters. An ideal campsite was found next to a large cave-pearl deposit high on one end of the room. Standing in camp, one had a tremendous vista of blackness,

punctuated by the mist and dull thunder of waterfalls pouring in from over 50 meters above. The camp crew consisted of Bill, Doug, Ed, Lisa, Richard, and me. The best lead was a climb up the far wall of the room, where a balcony could be seen receding into darkness. A similar lead in San Agustín had led to the enormous Anthodite Hall in 1979 (*AMCS Activities Newsletter* no. 10). Doug, alias Kaliman, led the ascent easily. After several meters requiring aid, it became a scramble up an angle-of-repose boulder slope. "Booty," we heard in the distance. It was spectacular. Another waterfall fell from the blackness. We had ascended 45 meters from the bottom of the Football Stadium and still we could not see the ceiling using several Wheat lamps in unison. Unfortunately, we had found a continuation of the big room, rather than going passage. Again Doug took to the walls, headed for a passage 10 meters up. He disappeared, then returned with a no-go verdict. Disappointed, we decided to call it quits for the day.

The next day, while Bill, Doug, and Ed checked another climb in the pit below the Football Stadium, Lisa, Richard, and I went up to map the previous day's find. As soon as we entered the passage above the second climb we felt good about it. It was very well decorated, and there was air flow. Richard smelled going cave beyond a breakdown pile and began to dig, following the air. It shortly opened into a down-trending tube. After a few climbdowns, we were looking down a pit. We surveyed out and contacted the other party, which had just returned to camp empty-handed. They surveyed up the Kaliman Wall and brought the large cache of PMI rope from camp. After a couple of short drops, the passage enlarged and became well decorated. Most importantly, it was heading south--right for Li Nita. Alas, our revelry ended abruptly at a flowstone near blockade. The wind howled through a crawl, and larger passage was visible only a meter away, but even the smallest person, working with a rock hammer, could not quite squeeze through. We had lost our

explosives in the equipment cache, so blasting would have to wait for next year. So close and yet so far: only 60 meters vertically and 200 meters horizontally separated the lead from a major in-feeder in Li Nita. We would be working in Nanta yet another year.

The trip out from camp was marred by an accident in the Narrows at -330 meters, still twenty drops from the entrance. Doug, laden with his camp duffle, was climbing when a foothold broke off. While trying to catch himself he suffered a dislocated shoulder. No one present could relocate it, so while Lisa stayed with Doug, Ed and Mark rocketed out in a record time of 2.5 hours. No one who entered over the course of the next day could reduce the shoulder either. Luckily Alejandro Villagomez, a caver from Mexico City, was visiting San Agustín. He had helped to establish an as-yet-unused Mexico City Police cave rescue group, and this seemed the perfect time to call them into action. With commendable speed they sent a five-man rescue team, including a doctor, which arrived in

a four-wheel-drive Jeep twenty-four hours later. Although we had finally gotten Doug's shoulder relocated, his pain and infections required the doctor's attention. Finally, after a four-day ordeal, Doug emerged safely, essentially under his own power. The next day he was taken to a hospital and released to the United States. During his ten days in Huautla, Doug never spent twenty-four hours in a row on the surface--undoubtedly a first!

Nita Nashi

With the rescue out of the way, we got back to caving. During the Nanta camp the remaining team members had been exploring a new cave we called Nita Nashi (Headwall Cave in Mazatec). The impressive entrance had been located two years earlier, but only cursorily checked. A low, wide entrance area more reminiscent of caves in Kentucky or West Virginia than in Huautla soon narrowed to a canyon and picked up a small stream. After a series of six drops to a to-



Rick Rigg emerging from the Brown Belly Blues, one of the digs in Nita Nashi (-134m). (Chris Albers)

tal depth of 90 meters, the cave became unexpectedly large and horizontal. Two impressive rooms were found, but nothing seemed to go, in spite of persistent air flow. Finally, a series of digs broke into a half kilometer of large, walking stream canyon, the Arizona Extension. Another impressive room, heavily encrusted with gypsum, signaled the change back to a more vertical nature. The second shaft series dropped 150 meters to a beautiful but treacherous steeply descending chert-ledge passage. This section was particularly unpleasant to negotiate, but fortunately it didn't last too long. A third series of drops brought us down another 135 meters to just over 500 meters deep. Again the cave leveled out, as it hit a much less soluble shaly layer. On the first trip there, Ed and Hal took off to check it out, without rope, and were gone six hours without finding an end. After that thirty-two-hour marathon trip, also attended by Lisa, Mike M., and Scott, we decided it was time to camp.

The last of our crew, Chris Albers and Rick Rigg, had finally arrived, three weeks late. They too had had problems: a head-on collision due to low visibility caused by ash from the eruption of El Chichón. Although the accident was not their fault, the bureaucratic hassles and repairs delayed them endlessly. For their warm-up, we had a photo trip and checked out campsites in Nita Nashi.

A few days later Ed, Hal, Mike M., Rick, Scott, and I entered Nashi to camp. On our first trip we split into two teams; Ed, Hal, and Scott mapped their earlier scoop, while Mike, Rick, and I rigged ahead. Unfortunately, only two drops and a short distance further, the stream entered a narrow sump, ending exploration. On that twenty-four-hour trip to 500 meters below camp a record 208 stations were set, adding 1.2 kilometers to the cave. The remainder of the camp time was used for derigging and checking higher leads. Although the cave headed predominantly south and was considered a likely prospect for connecting with La Grieta, in the final 500 meters it veered to the west, ending instead nearly under the entrance to Li Nita. From the profile map one can see that Nita Nashi dropped quickly to the same apparently impermeable layer that has controlled

and limited the descent of other caves in the area, especially La Grieta and Sótano de Agua de Carrizo. At 3.5 kilometers long and 641 meters deep, Nashi becomes the fifth-deepest Huautla cave and eighth in the Western Hemisphere.

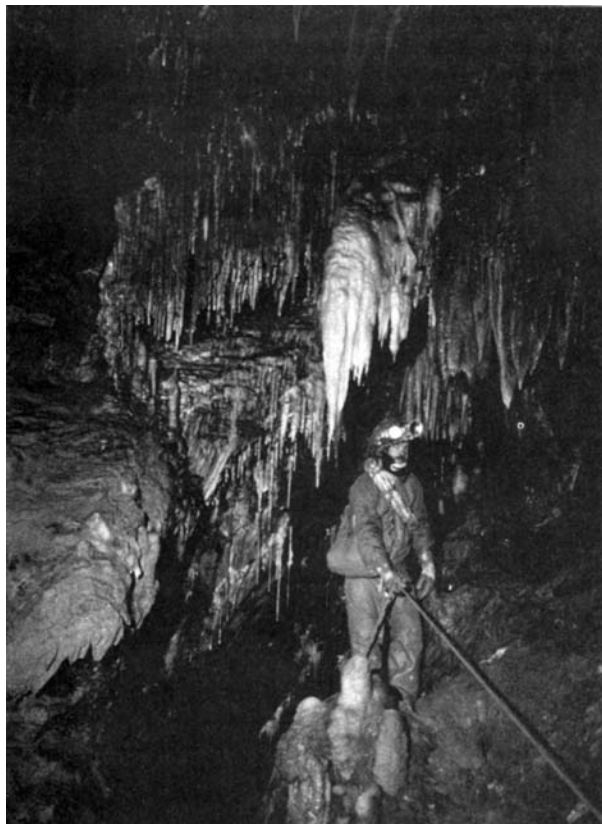
Coincident with the camp in Nashi, exploration of another new cave, Nita Sa, was initiated by Chris K. and Ted. The entrance to this cave had also been known since 1980, but it remained unentered. The impressive entrance passage soon narrowed to an impassable slot, but, by backtracking and climbing to higher levels in the canyon, forward progress could be made. Soon one could again descend to the floor. The air flow was excellent, and the small stream quickly doubled in size from infeeders. After a few hundred meters with only a couple of short rope drops, the tall, very tight canyon began to open up. As is often the case near the end of an expedition, only a few trips could be made before time ran out. The cave was explored down ten drops to a major stream junction at a depth of 212 meters. At this point the passage was developed in steeply sloping, clean-washed black rock very reminiscent of Li Nita. It was especially exciting as a prospective back door into the lower reaches of Nita Nanta, one half kilometer to the west.

1983 Expedition

After a year of anticipation, we were once again in Huautla, hoping for a connection. The '83 Project included Torie Baker (Idaho), Dave Black (Indiana), Jeb Blakeley (Idaho), Don Broussard (Colorado), Ed Holladay (Tennessee), Chris Kerr (Tennessee), Mark Minton (Texas), Ron Simmons (Virginia), Jim Smith (Tennessee), and Dale Weisman (Texas). Although the blast lead and its hoped-for connection to Li Nita were top priority, Nita Sa received our attention first, to see if it would indeed provide easier access to Camp II in Nita Nanta.

On the first trip, a large stash of PMI rope was stockpiled at the end of exploration in Nita Sa. On his way out, Chris pulled a muscle in his back in the tortuous entrance fissure. Although he was able to get out under his own power, he was, unfortunately, unable to participate in difficult trips for several weeks. The next trip to the cave was one of those

Nita Nanta



The top of the second drop in the Rat Tail File Series beyond the blast. (Ron Simmons)

exquisite scoop trips for which Huautla is renowned. We explored down eight drops in comfortably large, steeply inclined stream passage and then hit the big one. Rocks fell only two or three seconds, but we had a 75-meter rope we were tired of hauling, so it got the job. Ron won the toss and descended first. After a considerable time there came a barely audible call for more rope. I took a 25-meter piece down to where Ron was tenuously perched on a ledge, tied it on, and continued down. It was just enough. We could see down another drop and then another, but decided our work was cut out just mapping what we'd already seen. The survey took six hours and added over half a kilometer to the length of the cave, while doubling the depth.

After all the years of looking for connections, we now found ourselves in the curious position of hoping to avoid one. The field plot showed Nita Sa poised right above Camp II. But the cave was going so nicely we now hoped it would continue on independently, perhaps itself reaching over 1000 meters deep. Alas, the second drop below the 86-meter-deep Flaky Shaft was indeed in Nanta. But what a connection it was! The Maelstrom Shaft was a totally free 65-meter drop in the very center of the largest waterfall into the Football Stadium. And we had come out in the side of the room--the roof was still out of sight overhead.

The new route to the Football Stadium made camping unnecessary. A seasoned crew could be at Camp II in under three hours instead of the previous six. The Sa entrance was only 100 meters lower than the main Nanta entrance, but it was much closer and had only twenty rope drops rather than forty. Armed with plenty of Kinepak, a six-man crew headed for the blasting lead on March 16. The dig was exceedingly difficult, requiring five hours to open a sloping, body-tight crawl only 4 meters long. Just beyond the dig was a drop. Then another and another and another. We were going down fast, but hadn't gone far enough horizontally to hit Li Nita. A five-man crew returned three days later. The mountain of PMI left at the blast was suddenly looking much smaller. It disappeared rapidly as one drop opened into another time after time. The pit walls were lined with crusty, decomposing flowstone that covered everything with sand. This time we gained 180 meters of depth before running out of rope at a deep drop.

The Gorge

The effects of twenty-hour trips over 500 meters deep spaced three days apart were beginning to take their toll. But since some people were running out of time, we dared not waste too many days. One last major trip was mounted March 23 by Dave, Ed, Jeb, Jim, Ron, and me. We carried 150 meters of rope, enough to get us to the impermeable layer if it was manifest here, as it is so well in La Grieta and Nita Nashi.



Mark Minton at the top of the seventh drop in Nita Zan. (Dave Black)

The gritty ropes below the blast quickly wore down brake bars, hence the name Rat Tail File Series, where the upper bars on a rack lasted only two trips. The lead, our forty-first pitch for the day, was deeper than we had imagined, and it required two ropes tied together to descend its 55 meters. The cave below was totally different: a high, wide canyon filled with breakdown and with the unmistakable rumble of a stream. We located the water, but could only go a short distance downstream before breakdown blocked the way. By staying high, however, we found a hole leading down through the boulders. Halfway down this drop the stream came squirting in from the side. We had passed the blockage, and we found ourselves dropping rapidly in clean-polished, horizontally bedded black limestone. After two more pitches there were telltale signs of the shaly layer. We practically ran down 500 meters of Nanta Gorge to a confluence with an even larger stream. It was almost unbelievable. After all these years Nanta had finally opened up. Downstream, this larger

passage ended shortly in massive breakdown that will once again require a camp to push.

During the last trip there was one question on everybody's minds. How deep were we? The answer surprised us all. The entire Gorge was over 1000 meters deep! Cohetes flew over the doline as the cavers partied down that night. The Western Hemisphere's second kilometer-deep cave was virtually right across the road from the first. But there had not been a connection. In fact we passed under the part of Li Nita we had hoped to drop into. The deepest point, reached by Ed and Jim on a subsequent trip, was -1030 meters.

Concurrent with the last trips into Nita Sa/Nanta, work began on yet another old lead just north of Li Nita. Nita Zan was typical of the Nitas, steeply sloping passage with many short drops, a small stream, and good air flow. It was so close to Li Nita that a connection had seemed assured. Of course it didn't connect. Rather it ran parallel but dropped more rapidly. The second trip solved the mystery by connecting

with Nita Sa instead. A new possibility now presented itself. Nanta could still be connected to Li Nita via Nita Zan. Side leads in both caves were thoroughly checked, to no avail. The lack of a connection was tormenting; at their closest points the caves were a mere 17 meters apart.

The past two years have seen dramatic additions to the Huautla area cave survey, predominantly due to Nita Nashi and Nita Nanta. Dis-

coveries continue to bring new insights and surprises. Again in 1983, an incredible 1500 vertical meters were surveyed. Nita Nanta has grown to over 9 kilometers long and 1030 meters deep. The number of entrances has doubled to six. All told, there are over one hundred fifty drops in this one cave alone. But the challenge to fully integrate the Huautla system remains. It is a challenge we will continue to pursue.

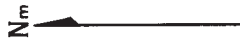
HUAUTLA PROJECT

Huautla

El objetivo principal de la Expedición Huautla fue el tratar conectar Nita Nanta y Li Nita, también el de efectuar una triple conexión entre Sótano de San Agustín, Sótano de Agua del Carrizo y La Grieta. El campamento fue colocado para buscar durante muchos días. La conexión no hallada, sin embargo excavación se le dio comienzo. Mientras tanto la exploración en Nita Nashi comenzó, diendo como resultado 3.5 kilometros de longitud y 641 metros de profundidad, convirtiéndose en la quinta caverna más profunda en Huautla y la octava en el continente americano. También Nita Sa fue explorada diez tiros abajo hasta conectar con un arroyo a una profundidad de 212 metros. La parte inferior en Nita Nanta se exploró por 500 metros hacia el oeste. La primera meta fue desde luego conectar Nita Sa con Nita Nanta. Lo cual daría la oportunidad de una entrada más cercana y fácil. La conexión estaba tapada pero finalmente se excavó, convirtiendo a Nita Sa/Nanta en la segunda cueva más profunda en el continente americano (-1030).

SISTEMA HUAUTLA OAXACA, MEXICO - 1983

LA GRIETA



NITA NASHI

CARRIZO

SOTANO
SAN AGUSTIN

NITA SA

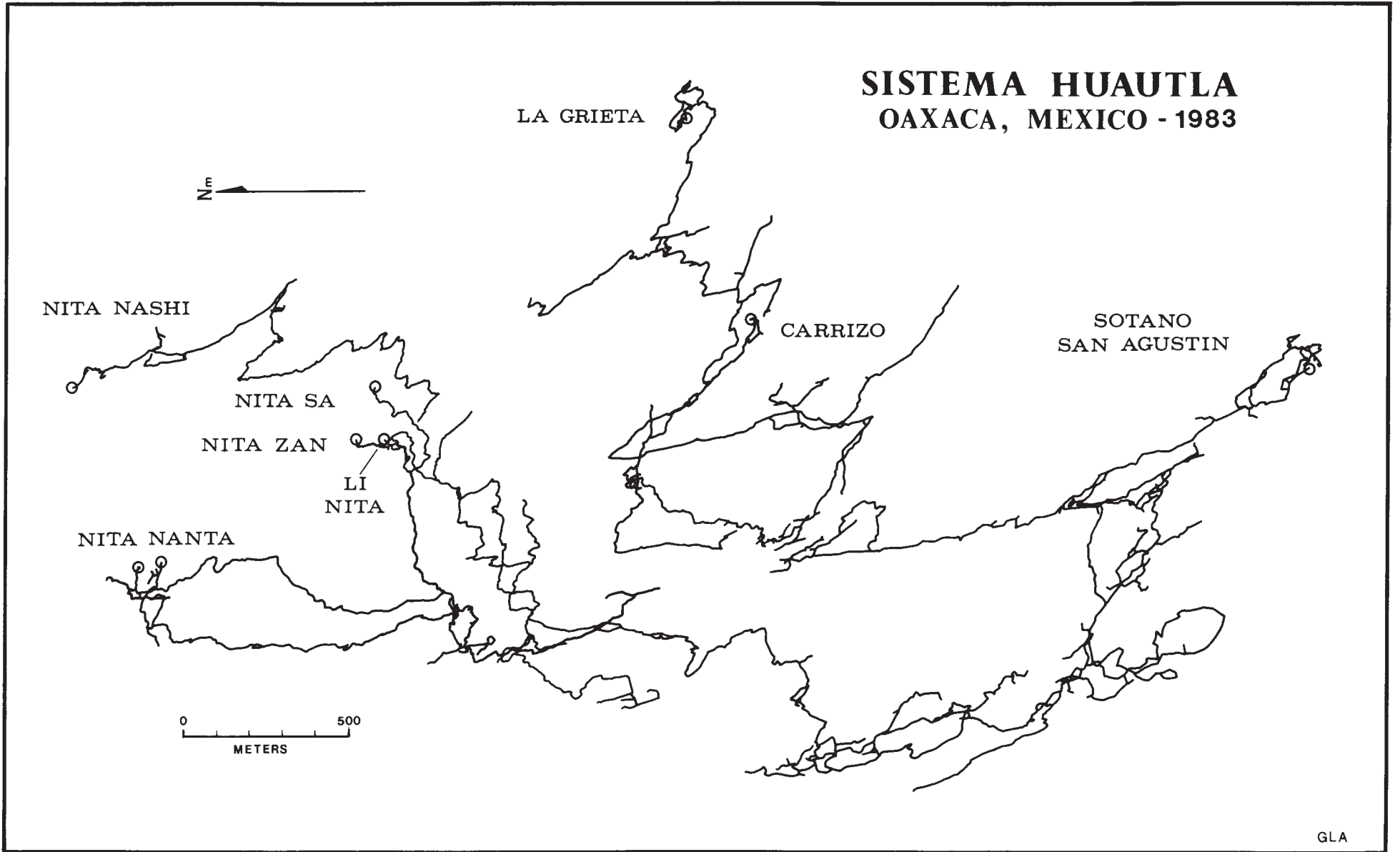
NITA ZAN

LI
NITA

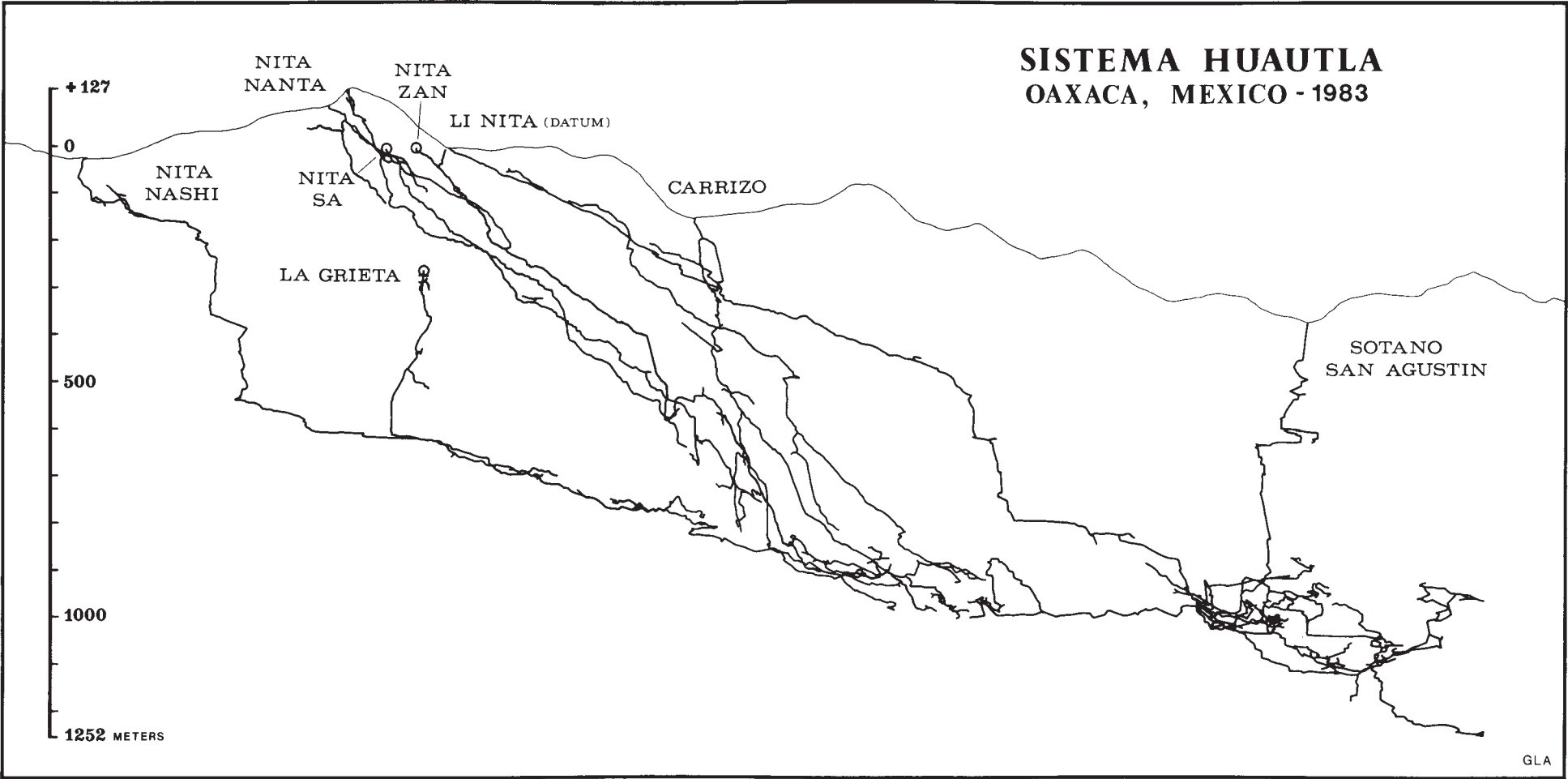
NITA NANTA

0 500
METERS

GLA



SISTEMA HUAUTLA OAXACA, MEXICO - 1983



SOTANO DE LAS COYOTAS

Carlos Lazcano

During the month of April 1982, members of the Sociedad Mexicana de Exploraciones Subterráneas set out to explore a new cave area in extreme northeastern Guanajuato. The Mirasoles area is in the Sierra Gorda de Guanajuato, part of the Sierra Madre Oriental. This area was located due to its proximity to the La Florida, Querétaro area, where we had been conducting photogeologic and speleological studies. During this first trip we explored forty new sótanos, including Sótano de las Coyotas, 581 meters deep, Sótano de las Hoyas, -282 meters, Sótano de las Coyotas No. 2, -160 meters, and Sótano de Odilón, 92 meters deep.

Access to the area is from the town of San Ciro de Acosta, in the state of San Luis Potosí, south of Río Verde. It is possible to drive to the village of Canoitas, and from there it is a three-hour walk to the uninhabited Hoya de Mirasoles.

Discovery of Coyotas

On the eighth of April, Maribel Garcia, Manuel Urquiza, and I were searching the area 3 kilometers north-east of Hoya de Mirasoles. After finding various small pits, we arrived at a wide, forested dolina. At the bottom we discovered two sótanos 80 meters apart. The first one we descended, Sótano de las Coyotas No. 2, had an entrance pitch of 60 meters. We saw that it continued, but we had run out of rope. So we went over to the other pit, Sótano de las Coyotas. The entrance is a fracture 8 meters long. I descended the entrance pit, a free drop of 30 meters, and then Manuel came down. Investigation of a short passage led to a second drop of 20 meters. We descended this to a large ledge overlooking the third drop. Since we were out of rope, we tossed a rock to check the depth. A deep one!

The following day Abigail Cervantes and I returned to the pit with over 200 meters of rope. We

quickly descended the first two drops and then the huge third drop, 56 meters deep. I descended first, and Abigail immediately after. We arrived at a small horizontal passage 5 meters long, through which there was a fourth pitch. This one dropped 68 meters to a small well, followed immediately by a fifth drop that we found to be 56 meters deep. We were then in a passage with two beautiful deep pools and a large flowstone mass coming off the base of the drop. Ahead was yet another drop, but the rope we had brought had run out. A rock drop indicated this pit was over 80 meters deep. Two hundred thirty meters down and still going!

To the Bottom

Several days passed during which we explored other pits in the area. On April 13, Antonio Saloma, Guillermo Mora, José Antonio Paez, and I returned to Coyotas with 700 meters of rope. We quickly negotiated the first five pitches and tied off a 100-meter line for the sixth. I began the descent slowly, 10, 20, 30 meters. Soon I was at 60, 70, 80 meters, and then I was on the bottom, at 84 meters. Now, six drops down, I was on a 3-meter-wide ledge over another drop. We all descended this one, of 23 meters, and the next one, which was 40 meters deep. This brought us to a large room at -400 meters, the Salón de Susana.

The Salón de Susana is the only spacious and comfortable place in the cave, and it contains a crystal-lined pool. The cave continues through a meter-diameter hole in the floor, the Hoyito Karstico. This gives access to a succession of drops of 12, 10, and 16 meters. Immediately after that was another long drop 58 meters deep. The cave then continued down drops 12, 26, 28, and 5 meters deep, with only very short stretches in between. The last drop lands in a small room in one corner of which is a fissure that becomes too tight

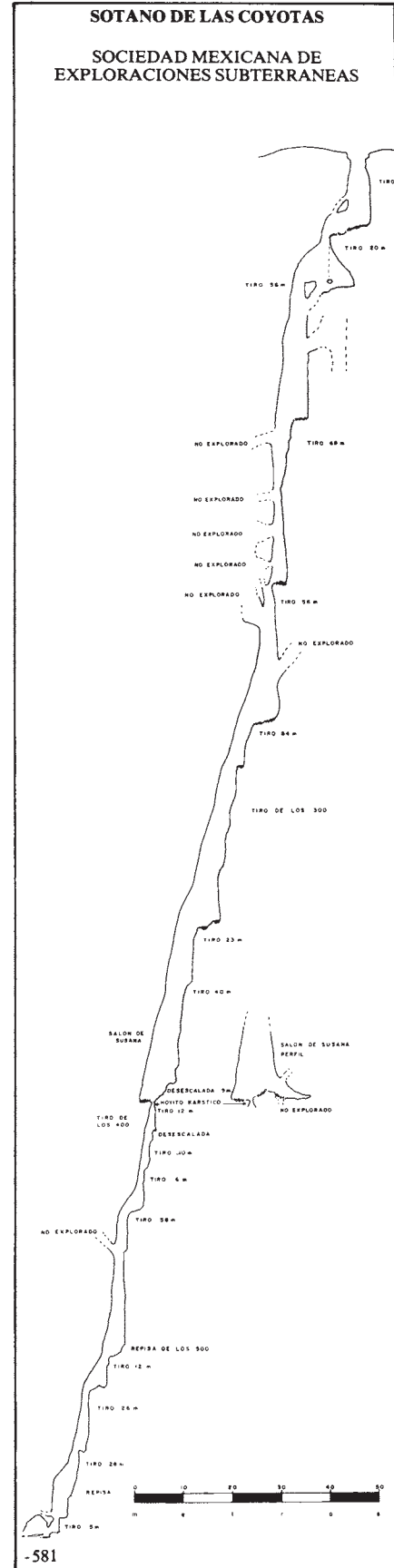
after a few meters. We were at the bottom, 581 meters down. After a good rest we began the job of completing the mapping and derigging. We left Coyotas on April 15.

Sótano de las Coyotas is a very vertical cave, but one that is easy to do. Exploration is not complete, since various leads remain to be pushed. Coyotas is at this time the twelfth deepest cave in Mexico and the Americas.

Participating in this first expedition to the Mirasoles area were Alejo Jimenez, Guillermo Mora, José Antonio Paez, Abigail Cervantes, Manuel Urquiza, Hector Guzman, Victor Granados, Maribel Garcia, Alicia León, Magdalena Garcia, Eduardo Martinez, Gonzalo Gomez, Antonio Saloma, Raymundo Arciniaga, and Carlos Lazcano.

Sótano de las Coyotas

El Sótano de las Coyotas está localizado en el lado noreste del estado de Guanajuato. Fue descubierto en Abril de 1982 por miembros de la Sociedad Mexicana de Exploraciones Subterráneas. Los espeleólogos topografiaron 15 tiros, siendo de 84 metros el más largo. Terminandose la caverna -581 metros de profundidad. La exploración no ha sido completada, quedando algunos pasajes por explorar. El Sótano las Coyotas ocupa el doceavo lugar en la lista de cuevas profundas de México y el continente Americano.



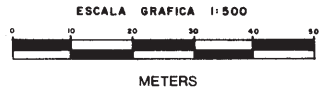
SOTANO DE LAS HOYAS

LAS HOYAS, GUANAJUATO
EJIDO DE TORTUGAS
MUNICIPIO DE XICHU

TOPOGRAFIADO EN ABRIL DE 1982
CON SUUNTOS Y CINTA

POR: C. LAZCANO R. ARCINIAGA
V. GRANADOS G. GOMEZ
M. URQUIZA A. PAEZ

DIBUJADO POR:
C. LAZCANO E. HERNANDEZ



PROFUNDIDAD 282 m.
LONGITUD 107 m.

SOCIEDAD MEXICANA DE EXPLORACIONES SUBTERRANEAS
GRUPO ESPELEOLOGICO UNIVERSITARIO

PERFIL EXTENDIDO

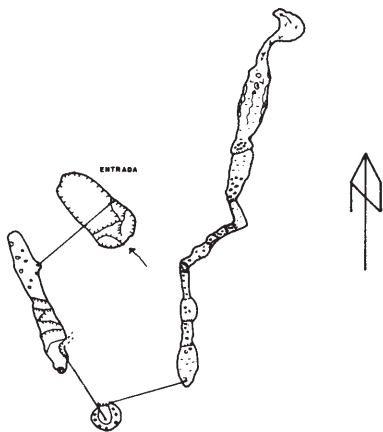
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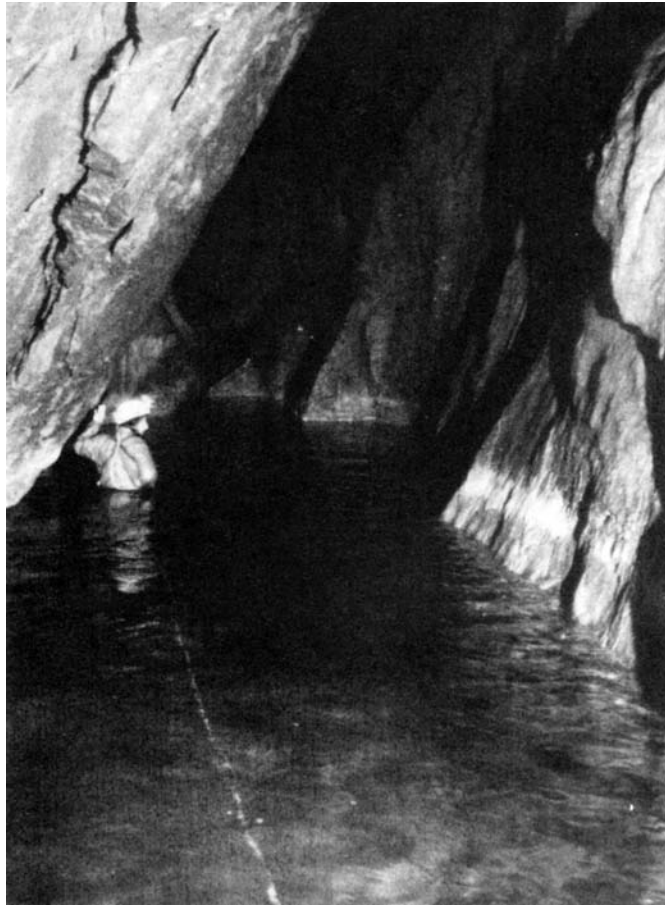
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Zongolica Project - 1983



Stephen Robertson

The Zongolica 1983 project was organized primarily to produce a film for French television depicting the spectacular river caves and the Indians of the Sierra de Zongolica, Veracruz, Mexico.

Philippe Ackermann went in advance to bribe gear out of customs and make arrangements in Zongolica. A month later, in mid-January, Genevieve Rouillon and I arrived. In early February we were joined by Jean Jacques Delannoy, Eric Loubie, and Guy Prouin.

When Gen and I arrived, Phil was anxious to return to Cotlaixco,

where he had just explored and mapped a cave, Sótano No. 1 de Cotlaixco, to -130 meters and where there remained many unchecked pits. But before we left Zongolica, we joined in a bucket brigade to help put out a burning house.

We spent about a week in Cotlaixco and descended numerous attractive pits, mostly between 20 and 40 meters deep. The most significant was named Sótano del Arco. This we mapped down several drops over polished marble to a window with a howling wind. A few less attractive drops later, the wind faded in a

series of fissures at a depth of 165 meters.

In addition, we explored Sótano de la Concepción de Axalpa No. 2, which is located just to one side of the seasonally dry Popoca river bed. This cave descends steeply over breakdown, with a couple of large rooms near the top, one with a large bat colony. Thereafter, it involves maneuvering between breakdown and the steeply dipping roof. Near the bottom, there is a lot of beautifully sparkling calcite, with one mass in the shape of a huge wine glass. We estimated we were about 80 meters deep at the bottom, where seasonal streams apparently filter through the gravel. I collected a blind amblypid here. No ropes are required if the correct route is taken.

Some locals took me on a tour of some nearby caves, showing me a water-source cave, Cueva de la Agua Escondida, with a rickety ladder leading down to a large pool, and Cueva de los Tzinpiles (urns), named after artifacts once found there. The latter is a small fossil cave with some old formations and a couple of cliff-side entrances near Palenque. Amidst a crowd of curious onlookers, Philippe descended the locally famous bottomless dead-snake-disposal-pit in Palenque, only to find the bottom a disappointing 39 meters below.

Cotzalostoc

We left many unchecked pits in the area to go to the Cotzalostoc, a stream cave near Totolacatla. A new road took us within a forty-minute hike of the cave, provided the correct trail is taken. We set up camp around a small shelter cave overlooking the massive entrance.

In a short trip, Phil rigged the drops down to the borehole they had reached two years back. There are only five or six drops, a few pendulums, and a couple of tension traverses, all in all involving more than twenty-five anchor points to negotiate. We used about 250 meters of 5/16" PMI, with all of the rigging clear of the water. The last drop is 40 meters or so against flowstone and marble, into a huge passage floored by polished boulders on marble-streaked bedrock. A couple hundred meters ahead is the first lake, and

after about another hundred meters of somewhat smaller passage is the second lake. Immediately after the second lake, the passage widens to about 20 meters, and the roof is out of sight, mainly because there is a very dense fog in this section. A couple of large unexplored side passages lead off, and bats flit about, so there is likely another entrance above somewhere. This area was the previous terminus.

As we prepared to temporarily leave the Cotzalostoc, Genevieve was scouting for a tent site and was bitten by something unseen in the brush. That night her forearm developed a grapefruit-size lump with two snake-fang marks in the center. After a feverish night, the swelling subsided.

I had collected blind catfish in the lakes and returned to Austin briefly. Meanwhile, the other Frenchmen arrived, and they filmed in Cotzalostoc's pit series and explored the cave to its end. On my return, we filmed the remaining part of the cave. From the fog room, we climbed a giant mud dune, perhaps 30 meters high and an undulating 500 meters long. To one side, a giant unexplored side passage leads off. This massive mud deposit is apparently caused by flood waters backing up behind the second pit series, which is formed in a relatively narrow fault. After a short 8-meter rope drop and then a pool, there is a slick marble climbdown where a rope is helpful. A couple climbs and a large pool follow, and then borehole passage resumes, mostly gravel-floored and very level. A huge, very muddy partially surveyed side passage leads off. A nice keyhole section is followed shortly by the terminal sump at -215 meters, which has a very large number of blind catfish in it. A small lead up in the opposite wall may get to the continuation, but we did not have time for the aid climb required. We mapped the cave for a total of over 1600 meters with the "topofil," that frustrating thread-breaking device. Jean Jacques is working on the map, and it should be published soon.

Back in Zongolica, we met with Carlos Lazcano, Gerardo Fernandez, and other Mexican cavers on a weekend

Opposite: A pool near the bottom level in Cotzalostoc.
(Stephen Robertson) (Film courtesy of 3M)

trip from Mexico City. They had just finished mapping the Apopoliukan pit in the San Sebastian area. In addition, they had also been exploring the Ahuihuitzcapa, which apparently was even more impressive.

El Precipicio

Our next project was to climb the waterfall at El Precipicio. We set off on foot from Zongolica with three mules loaded down with food and caving and cinema gear. A two-hour hike along a beautiful, well-traveled rock trail brought us to Apanga. We camped in a grassy doline pasture below Don Fidencio's house.

From Apanga, after a steep forty-minute hike along a black-streaked cliff, we arrived at the base of the falls. This is the resurgence of the Altotoco river. There are two falls, the upper and lower ones, slightly displaced horizontally. The lower falls is about 15 meters high and has a fairly large, constant flow. The upper falls, about 30 meters high, emerges from a good-size entrance. This falls flowed sporadically while we were there. Certainly the flow was less than in previous years. Some locals thought perhaps there had been a dam built far upstream, above Sumidero de Aticpac, in the state of Puebla. Eric began leading the climb to the upper falls' entrance when it was dry, and water began spilling out after about an hour. By the time he reached the top, the flow had again subsided.

The following day, Phil, Guy, and I went to film the falls from the opposite side of the valley. Meanwhile, Eric, Genevieve, and Jean Jacques climbed the fixed rope up into the cave. They found a series of lakes leading to a sump a short distance from the entrance. After they surveyed out, we met at the entrance. Phil climbed part way up, pendulumed over to the lower, larger falls, and determined it was emerging from a sump. He began continuing up to the higher entrance, but he suddenly switched over and started descending. He had just realized he had been bitten by a snake in the undergrowth by the lower falls. At first, he thought it was a lizard crawling on his leg, but, feeling pain, he found a couple of bites on his ankle. Since Phil did not see the snake and the wounds were already causing him discomfort, we decided to get him to the clinic in Zongolica as soon as

possible. Eric carried him down the trail to the nearest local's house where, fortunately, there was a mule, which we borrowed. I headed off with Phil, and the others returned to derig the falls. Above the cliff into Apanga, we ran into the father of our muleteer, who refused to let us go on with his mule, so we put Phil on one of Don Fidencio's mules and took off. Phil was feeling well, and his foot had not swollen very much. We arrived in Zongolica a mere three hours after the bite. After a couple of hours in the clinic, Philippe discharged himself, his worst pains being an IV insertion and saddle soreness. The following morning, Phil's birthday, we both hiked back to Apanga to help break camp. Phil was viewed like a living ghost, and had to recount his tale to everyone along the trail.

Sabotage?

The pits near San Sebastian were our next filming project. Arriving in the afternoon, we hiked 30 minutes to leave some gear and a 200-meter 7/16" PMI at the Apopoliukan pit. On our return the next day, we found that Eric's helmet and lamp had been stolen, along with my rack. This was the first such incident for cavers in Zongolica. After rigging the rope, Philippe descended to a highly eroded ledge that I had reached two years earlier, perhaps 60 meters down. Here, there is a small pit to one side away from the main drop, which the Mexicans had not explored. Phil rigged down this to the bottom another 20 meters or so down, and signalled us down. In the jumble of rope on the floor, he noticed a pronounced caterpillar-fray. This was in the middle section of a new rope, and it could not have occurred from lowering the rope into the pit. We realized someone had cut the rope, which we had left overnight, around the sheath and into the core. This slice had pulled apart due to the weight of rope below it as we had lowered it into the pit. Apparently whoever stole the gear had other intentions also. Fortunately, Phil chose to explore the side pit instead of continuing on down the main drop, which would have put the slice about 100 free meters above the bottom. We derigged and returned to Zongolica and complained to the officials there. We then complained to the authorities in San Sebastian,








ZONGOLICA AREA

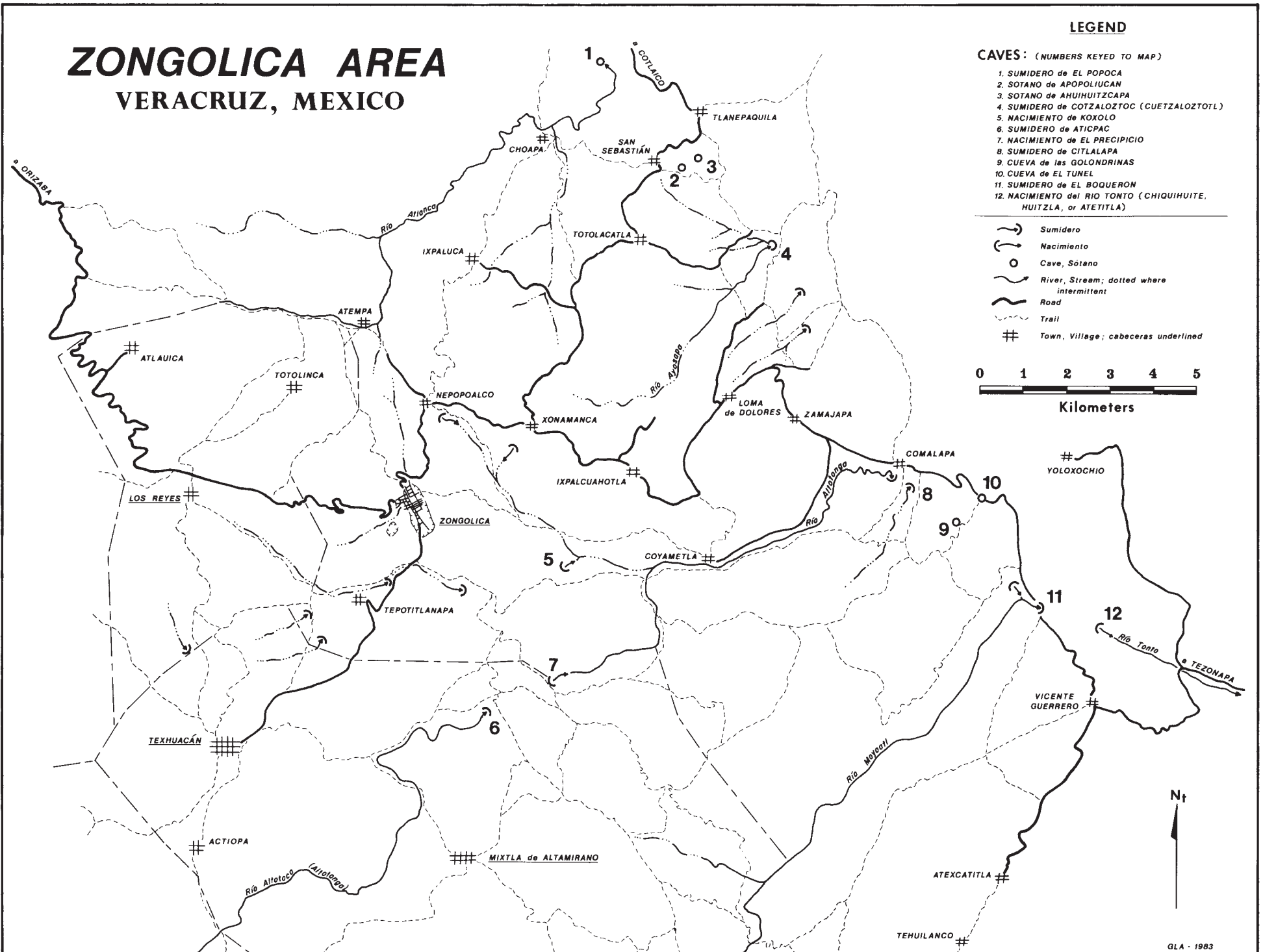
VERACRUZ, MEXICO

LEGEND

CAVES: (NUMBERS KEYED TO MAP)

1. SUMIDERO de EL POPOCA
2. SOTANO de APOPOLIUCAN
3. SOTANO de AHUIHUITZCAPA
4. SUMIDERO de COTZALOZTOC (CUETZALOZTOTL)
5. NACIMIENTO de KOXOLO
6. SUMIDERO de ATICPAC
7. NACIMIENTO de EL PRECIPICIO
8. SUMIDERO de CITLALAPA
9. CUEVA de las GOLONDRINAS
10. CUEVA de EL TUNEL
11. SUMIDERO de EL BOQUERON
12. NACIMIENTO del RIO TONTO (CHIQUIHUIITE, HUITZLA, or ATETITLA)

-  Sumidero
-  Nacimiento
-  Cave, Sótano
-  River, Stream; dotted where intermittent
-  Road
-  Trail
-  Town, Village; cabeceras underlined



who assured us the gear would be recovered and the culprit punished, but little was ever really done.

Ahuihuitzcapa

Since the drizzle kept us from filming in the Apopoliukan, we decided to go have a look at the entrance to Ahuihuitzcapa. The entrance was even more beautiful than the Apopoliukan, with rocks hitting after seven seconds or so. Ahuihuitzcapa lies in the center of a huge doline, and locals say a good-size stream seasonally enters the pit. It was so impressive that Phil and the others decided to scoop the Mexicans here.

Returning back to the Apopoliukan, we rigged another new 7/16" PMI, and, after a re-belay at the ledge, we had a free 100-meter drop to the bottom. We filmed only the main drop, and found lively tree frogs and a not-so-dead coral snake below. On the climb out, in a struggle at the ledge, my filming light switched on in my pack beneath me. The heat of the lamp burned my pack, and acrid smoke billowed out. I yelled a lot as I struggled to switch it off before the hole burned large enough to drop my five-kilogram power pack and other goodies onto Genevieve, who was climbing the same rope some 70 meters below.

Later, Eric took us on a tour of pits he had been shown by some locals. They were very attractive, but small, with perhaps 30 meter drops, and they remain unchecked.

I spent several days on the surface collecting, while the others explored Ahuihuitzcapa. Apparently it is large, clean, and beautiful, with a 190-meter entrance pitch, dropping quickly down to a short sumping stream passage at -455 meters.

On the first Friday of March, we went to film a party in Totomoxapa Cave, which is a large, dry cave with a flat mud floor. About one hundred locals gathered inside and around the entrance. Despite a live band playing underground and free-flowing mezcal, it was a pretty lifeless celebration. Half of the people dancing were cavers.

Popoca

After everyone left, we hiked down the riverbed to the Popoca, still awesome even though the water was much lower than in the spring of

1981. Eric descended an adjacent pit down to a log jam, with a fine view of the main waterfall pit.

The following day, we had a very memorable descent into the Popoca. In the sunlight, surrounded by a rainbow, the pounding water cast spray about as we dropped into the churning lake after a final 30-meter free rappel. We filmed back to the sump, which was somewhat lower than before, and not as full of blind catfish as I had remembered.

After wading across the lake and climbing out onto a slippery rock, I was startled when I nearly grabbed a snake-hold. Gen came across and helped me capture it. We put our prey in the rubber sack used to protect the underground sound equipment (a Walkman Professional). Apparent passages on that side of the lake turned out to be amphitheatres facing the lake, with many snake-like sticks between boulders. One alcove had a worthwhile set of rimstone dams leading up to a nice column, with a porch overlooking the lake.

For the climb out, I put our recorder in a plastic sack along with my other gear, with the snake gingerly on top. After swimming out to the rope, I had a hard time getting started with a pack that spurting water out of the burned hole for about five minutes. Topside, we found that the recorder was flooded. Fortunately, after a couple of days drying in the sun, it seemed to work satisfactorily.

Pigs and Riches

There were pits in Cuetzapotitla, near Tlanepaquila, rumored to be full of treasure, so we went to check, more to film the locals' reactions than expecting to find riches. Having been refused permission to enter one pit, Guy descended another to the end of 80 meters of rope, about 10 meters off the bottom, with a possible meander leading off. Numerous other deep pits remained unchecked. Locals told us of a huge dry cave in nearby Coetzala with a sun, a scorpion, and other figures painted very high up by unknown means, a story we had often heard before. A large seasonal resurgence is reportedly nearby, probably the outlet of the Popoca system. All of these promising leads remain unchecked.

Pétalo, our piglet mascot, retired me from the expedition by knocking a camp stove onto my foot, giving me a large second-degree burn.

After I left Zongolica, the others went on to film and continue exploration of the Boquerón. Water was much lower than in 1981, and they reached a sump about 150 meters of swimming beyond the previous end. Considerable gear was stolen from the van and camp in this area, and Pétalo was pignapped in San Sebastian. Such is life.

Despite all the minor difficulties and being plagued by drizzly weather, we had a successful trip. The film results should speak for

themselves. Spelling of cave names in this article may vary slightly from other publications, but those given are accurate phonetically. [Steve's Apopoliukan is spelled Alpupuluca by the Mexican cavers, for instance. See Mexico News.--ed.] We would like to acknowledge assistance from 3M (film), Duracell, PMI (rope), the French A-2 television network, and Petzl and TSA (French caving gear). We all expect to return for more caving in this superb karst area some day.



Popoca entrance drop. (Stephen Robertson) (Film courtesy of 3M)

Zongolica

Espeleólogos franceses organizaron en 1983 una expedición a Zongolica con la idea de producir una película para la televisión francesa acerca de los ríos subterráneos en la vasta Sierra de Zongolica, estado de Veracruz. Dicha filmación incluyen Cueva de Cotzaloctic, cerca del poblado de Totalocatla; las cascadas del Precipicio; el río subterráneo Popoca, también varios tiros cerca del poblado de San Sebastian y otros tantos en Cuetzapotitla. La filmación contiene dos cuevas encontradas inicialmente por mexicanos.

Reconnaissance to the



Huautla Resurgence

Bill Stone

The location of the resurgence for the Huautla cave system was the subject of conjecture for many years. Some held it to be at the base of the angular southeast buttress of Cerro Rabón, since a sizable spring had been sighted there from the air. Others said it was near the town of Agua Español, as a zone of "manantiales" had been reported there both on the old military topographic maps and from word-of-mouth information from local Mazatecs in the village of San Agustín Zaragoza. In general,

however, there was agreement among those who had worked in the caves of Huautla that the resurgence most likely lay somewhere in the depths of the Santo Domingo canyon to the south of the primary caving area. The interest in the location of the resurgence was mainly one of pinning down the ultimate depth potential for the caves of the Huautla Plateau. But there were secondary factors, the most important of which was the possibility of exploring up through the mountain and linking in from

Photo: John Zumrick prepares to submerge in Sump I for the second penetration dive on April 21, 1982. (Bill Stone)

below. In 1980 and 1981 three attempts were made to find this resurgence.

The Cerro Rabón spring was scouted in March of 1980 by Dino Lowery, Bob Jefferys, Ron Simmons, Janet Steele, and Jerry Atkinson, and it was found to be some 20 kilometers distant from San Agustín on the opposite side of an impenetrable shale stratum. While it is likely that it drains an extensive cave complex, it is highly unlikely that it is Sistema Huautla. In March of 1981, Steve Zeman, Dino Lowery, Bob West, Robert Hemperly, Jean Jancewicz, and Bob Benedict spent five days searching for the springs at Agua Español. This area is located approximately 10 kilometers southeast of San Agustín, below the town of San Juan Coatzapan. The locals, who in this area are a blend of Mazatec and Mixtec, guided them to numerous caves, none of which were the hoped-for resurgence. At the end of the 1981 expedition, we hit upon a different approach. From the prominent knob just above the entrance to Nita Nanta it is possible to obtain a panoramic view of the caving area. From this vantage it is apparent that the major dolinas that overlie the cave system follow a strikingly linear path. It has long been known that the system is basically contained within a tilted synclinal trough. Caves to the west of the central axis drain east and south. Caves to the east drain west and south. The central axis, evidenced on the surface by the linear pattern of dolinas, points to a prominent and deep side canyon of the Santo Domingo below the town of El Camarón Huautepéc. My wife Pat Wiedeman and I investigated this area in May of 1981 and eventually came across an impressive paleo-resurgence cave at an elevation of 350 meters, not unlike the Cueva de Infiernillo at the bottom of Sistema Purificación. The entrance lay at the base of a 300-meter sheer-walled escarpment. Local Mazatecs in El Camarón referred to this feature as the Peña Colorada, and so we adopted the name for the cave. We were only able to explore this for 140 meters before coming to a sump. The sump measured some 8 meters in width, was exceptionally clear, and, with the limited light we had on hand, appeared to be at least 10 meters deep. By itself that would not be much of an attraction, given the remoteness of the place. It was the size of the

arroyo leading from the entrance--20 meters wide on a 30-degree slope--that gave one the unshakable belief that something vast was happening here. A local horseman stated that more water came from this entrance in the rainy season than was normally carried by the Santo Domingo river. There was only one possible source with a hydrologic net large enough to concentrate that much flow.

Resurgence Push

In the fall of 1981 I had an opportunity to learn a great deal about long-distance cave diving from Sheck Exley, John Zumrick, and Paul DeLoach. Operating in the springs of north Florida at depths from 20 to 30 meters, we gradually worked up to a penetration distance of 900 meters. This was more than three times the exploration limit achieved in the San Agustín sump in the spring of 1981, and the immediate thought that came to mind was to have a look at the Peña Colorada resurgence. Further encouragement for a reconnaissance dive at the resurgence came from a number of sources. Art Palmer performed a series of fluid-flow calculations and concluded that the majority of the passage between the San Agustín sump and the Peña Colorada was air-filled. Sergio Zambrano then offered to assist with arrangements in Mexico City so that a team could fly in with minimal weight. With these two factors tipping the balance, we arrived in Huautla on April 16, 1982 for a ten-day stay at the Peña Colorada. The team included Dr. John Zumrick, of the Navy's Experimental Diving Unit, Pat Wiedeman, and me.

Base camp was set just inside the entrance of the Cueva de la Peña Colorada, the paleo-resurgence cave. One of our first tasks was to scout the lower sections of the Peña Colorado canyon and the western portion of the Santo Domingo canyon for the presently active springs. We found three notable ones, all along the banks of the Santo Domingo, that accounted for some 150 cusecs of combined flow. In one of these, HR Resurgence Cave, we were able to explore some 300 meters upstream before reaching a sump. The others were true springs, with the water boiling up from caves at the base of the canyon walls. In all of these we placed activated-charcoal traps to monitor the possible passage of dye. We had



Placing activated charcoal traps at the western resurgence in the Santo Domingo canyon. (Pat Wiedeman-Stone)



John Zumrick charging tanks with the 5000 psi Bauer-Variis compressor. (Bill Stone)

dumped 3 kilograms of powdered fluorescein in the Río Iglesia before beginning our descent from the high plateau. Unfortunately, we had to pull the traps after only a seven-day period due to time restrictions, and none showed a positive trace. Palmer had warned us that a good trace might take as long as two months, given any sumps or silt blockages along the way, so we had gambled that it might get through, and lost. We fared considerably better with the exploratory work at the Peña Colorada.

For diving the sump below camp, we had brought along four sets of double Acurex filament-wound high-pressure tanks and a broad assortment of peripheral hardware, which we felt would allow us to achieve up to a kilometer penetration should the need arise. The navy had generously loaned us a 30-kilogram Bauer-Variis portable compressor to charge the tanks. In order to conserve

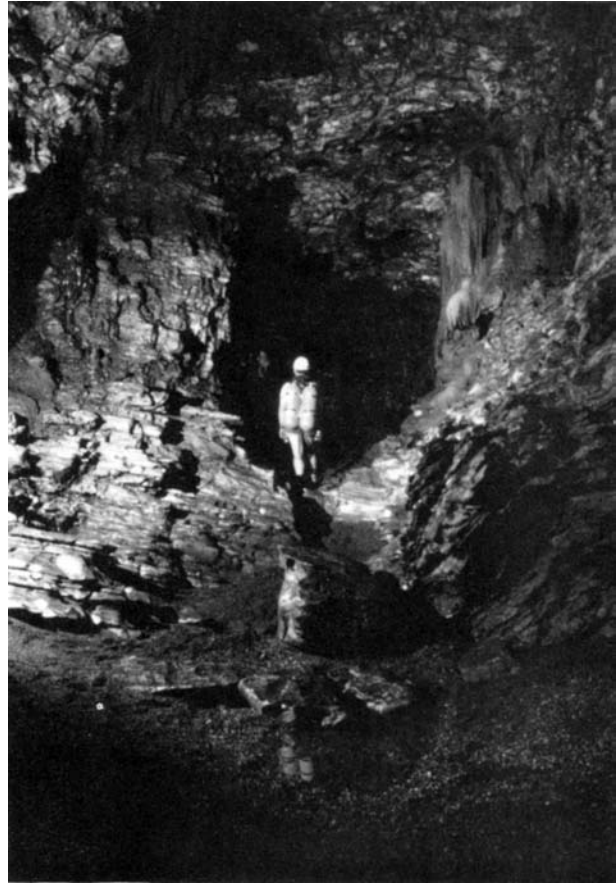
battery power on our primary 30-watt dive lights, which we had no facilities to recharge, we decided to do the first two dives solo. I took first crack and reeled out to 250 meters penetration at a depth of 12 meters. The passage maintained average dimensions of 10 meters in height and 6 to 10 meters in width. Visibility was excellent, despite a significant amount of silt percolation as the exhaust bubbles hit the roof. On the second dive, John picked up at the end of my line and reached 400 meters penetration at 20 meters depth before running out of line. We were now anticipating a fairly long dive before reaching airspace, and we planned the next dive as a double-stage effort; both John and I were to carry in two additional front-mounted bottles. These "stage bottles" would be breathed going in until their pressure was one-third down from the starting value. There they would be

unfastened from our harnesses and clipped to the dive line for subsequent use on the return. We would then be near the previous limit of exploration with a fresh set of back-mounted tanks.

Dry Borehole

On April 23, John and I broke surface at the base of a 20-meter dome, 524 meters from the start of Sump I. I free-climbed this dome and explored some 200 meters, while John waited with the tanks. The passage met with a 10-meter-diameter borehole that went both up and down dip. Considering the need for further equipment and dry-cave survey gear, we called it a short day and headed for camp. On the return dive we carefully monitored our air consumption and found that we had used barely half of the air in the front-mounted stage bottles during the round trip. The next dive could be done solely with back-mounted tanks. Following a guide line that is in place is always easier than the initial, stressful exploration.

Two days later John, Pat, and I reached the dome beyond Sump I and stacked our dive gear on the rocks. We made certain that the tank valves were securely turned off. With a 524-meter dive the only way out, we would have been in some deep trouble if even one of the tank sets lost pressure. After installing a fixed line in the dome, we surveyed up into the dry gallery, bearing right at the junction where I had stopped. John took point and surveyed up a steep sand slope. After a few hundred meters the passage leveled out and began to narrow down. The floor was composed of compacted mud and showed signs of ponded water at some time in the recent past. This was not the main route that we had seen part of lower down, but more of a side branch where the water backed up when the cave flooded. The passage was heading due east now, and we knew we had to be getting close to the west wall of the Peña Colorada canyon. This notion was reinforced when Pat noticed dead leaves on the floor and a change in air temperature. The tunnel soon took a sharp rise in elevation and showed signs of pinching out. Pat was ahead with the lead end of the tape, doing a final poke while John and I went over the survey notes. "Hey guys, you're not going to believe this," she said, "I see day-



Zumrick hauling tanks from base-camp to Sump I, Cueva de la Peña Colorada. (Bill Stone)

light!" Zumrick and I sat there momentarily stunned, then scrambled up the slope. Pat was forcing herself through a small hole where the light was coming in. Beyond, there were banana trees growing inside a gigantic old phreatic entrance with eroded formations clinging to the roof. It took only a moment to pinpoint our position: we had popped out the side of the canyon wall a little over a kilometer due north of camp. This was an unexpected turn of events!

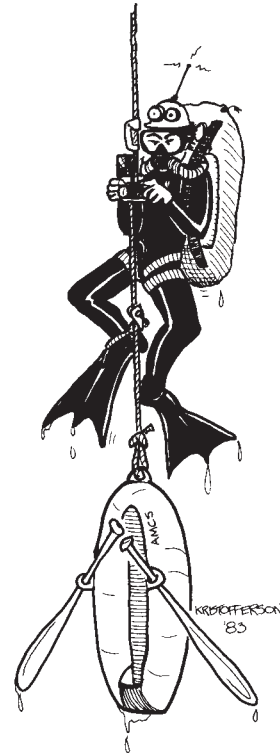
Sump II

The urge at the moment was to attempt to climb and rappel down into the canyon and return to camp that way, but our dive gear was on this side of the sump and the easiest way to carry it back was to swim with it. Having the optional exit immediately relieved the leaden weight of remoteness, and with renewed vigor we fired

our carbide lamps and headed back in to see where the left-hand trunk would lead us. Back at the junction we tied in to the previous survey line and began a series of 30-meter shots that continued for 400 meters on a northwestern bearing to the top of an immense slope of clean-washed gravel. This descended for 60 meters at the angle of repose to the edge of a lake. We swam across to a small gravel bar some 30 meters distant, and there we could hear the telltale echoing of water lapping at the edge of a sump pool. The final chamber was 15 meters in diameter. The sump was deep and crystal clear, and we could see an underwater tunnel taking off to the north.

Pat and I returned the following day via the new canyon entrance to survey a large, upper-level formation gallery in hopes of bypassing Sump II. Unfortunately, it ended after 300 meters, leaving a dive as the only means of future progress. The Cueva de la Peña Colorada currently has 1.97 kilometers of surveyed passage, of which nearly a third, including side passages off Sump I, is under water. Sump II lies 5.5 kilometers from and 200 meters below the San Agustín sump, a substantial distance if any large percentage of it is flooded. Since 1977 diving in Huautla has become progressively more sophisticated, as longer and deeper underwater galleries have been probed. Sometimes the efforts, as in the case of the San Agustín dive in 1981, have yielded only slight short-term rewards. Other times, such as the 1980 link from Li Nita to San Agustín

and the breakthrough at the Peña Colorada, the discoveries have shown the promise of this new tool that will take its place beside the old, time-proven methods of caving. Perhaps the 1984 expedition to the Peña Colorada will be the first to achieve that promise. An underwater tunnel will then become just another obstacle, like big walls, like vertical drops, like everything else.



Peña Colorada

La Cueva de la Peña Colorada se localiza abajo del poblado de Camarón Domingo en lo profundo del Cañon de Santo Domingo. Esta caverna se presume como la paleo resurgencia del Sistema Huautla. En Mayo de 1981 Bill Stone y Pat Wiedeman exploraron la cueva hasta un sifón. In Abril de 1982 regresaron junto con Dr. John Zumrick para bucear con tanques. Dicho sifón que se prolonga durante 524 metros, terminando en un grande pasaje. El cual lleva a una conexión con otra galería que consigue a una diferente entrada en el cañon. El segundo pasaje lleva a otro sifón. Bill Stone planea regresar en 1984 para bucear el sifón II. Dicho Sifón está 5.5 kilometros con un desnivel de 200 metros abajo el sifón del Sótano de San Agustín. Actualmente la cueva mide 1.97 kilometros.

Cueva del Túnel, Veracruz

Stephen Robertson

Cueva del Túnel is a short, attractive cave of particular biological interest because it is one locality where the blind catfish of the genus *Rhamdia* is found. The cave is located in the Zongolica, Veracruz area, about two kilometers north of the source of the Tonto River. The entrance is adjacent to a dirt road from Zongolica, between Comalapa and Chicomapa in the ejido Porvenir in the district of Mahuilca. The cave is near the house of Aristeo Zopiyactle Porrás, who told us about the fish and said he occasionally captured them to eat.

Also known as El Ostoc, the cave is widely used as a water source by the locals. At an elevation of roughly 250 meters above sea level, the entrance opens into a good-size room with some formations along the right wall. A slope leads down to the first pool, and there are steps carved into the mud on the steeper parts of the left side, bypassing a muddy pocket. A little alcove on the right wall has a small pit choked with boulders.

The edge of the first pool is lined with organic debris from the surface. The pool is narrow, and a little over a meter deep at the deepest part, where the roof dips down to within half a meter of the water's surface. The opposite side is a sandy bank leading up into a muddy room with a dry stream channel along the west side. At the end of this room is a steep, muddy slope overlooking the second major pool.

This pool is just under a meter deep, with small breakdown blocks on the bottom and flowstone at the edges. Beyond is a small platform with two large columns, and then the largest of the three major pools. It is about waist deep, with a regular silt-covered bottom. A sandy beach follows, and a boulder-strewn slope on the right goes up to a dry side passage that leads over muddied flowstone to dry rimstone dams. A large, dry flowstone curtain with a couple of small rimstone dams overlooks the main passage. Along the left wall from the beach, a corridor with a small trench and a couple of

tiny pools leads up to the flowstone curtain. There is a small pool up against the base of the curtain, and some sharply fluted rocks are to one side. A couple more small pools follow, with a large block between them. The terminal room is mud-floored, with a little opening at its lowest point that appears to drain a small amount of water at certain times.

In late March of 1981, I explored most of the cave with Sr. Zopiyactle and managed to collect only one catfish in a dip net. After two more trips in the cave, one with Gerardo Fernández of Mexico City, we had a total of only two specimens collected. On Christmas day, I returned to the cave with Jeff Robertson, equipped with a seine and other nets, and we soon collected over twenty specimens and also mapped the cave. At that time, the water temperature of the first pool was 19.5°C (it was a cold day on the surface), and the third pool was 21°C. Terrestrial isopods, millipedes, diplurans, spiders, and large crickets were also collected.

Fish are found in all three of the larger pools, and one small specimen was sighted in a little pool near the end of the cave. Debris on the walls nearly two meters above the water indicates occasional flooding of the cave. This certainly enables the fish to migrate freely between the pools. Curiously, there is a very wide range in the morphology of the eye and the pigmentation of the fish.

Related surface fish, locally known as "cuiles," are a common food fish from the Tonto and Popoca rivers. The Popoca drains into a cave where both blind and eyed forms have been collected from the sump at -76 meters. Blind catfish have also been collected from the Sumidero de Cotzalostoc down to -215 meters. Fish are said to be abundant in the bottom level of Sótano de Ahuihuitzcapa (-455 meters), but only one decomposing specimen was collected.

The fish in El Túnel are probably from the Comalapa drainage system, towards which the Cotzalostoc and Ahuihuitzcapa likely flow. This

CUEVA DEL TUNEL

MUNICIPIO DE ZONGOLICA

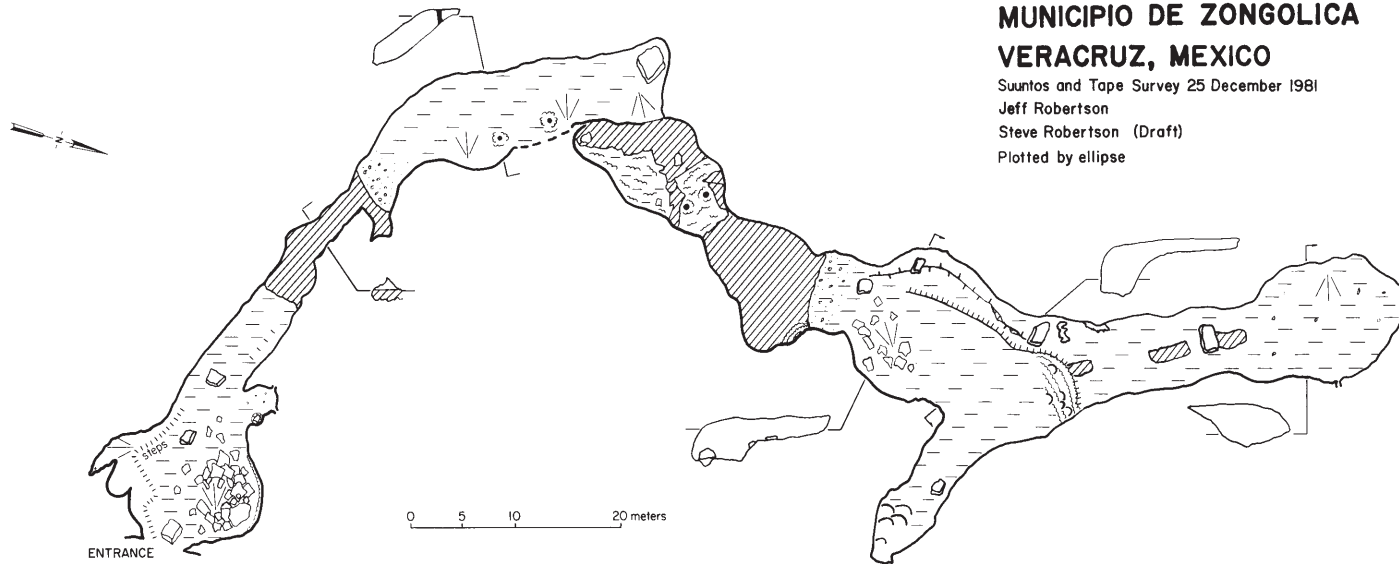
VERACRUZ, MEXICO

Suuntos and Tape Survey 25 December 1981

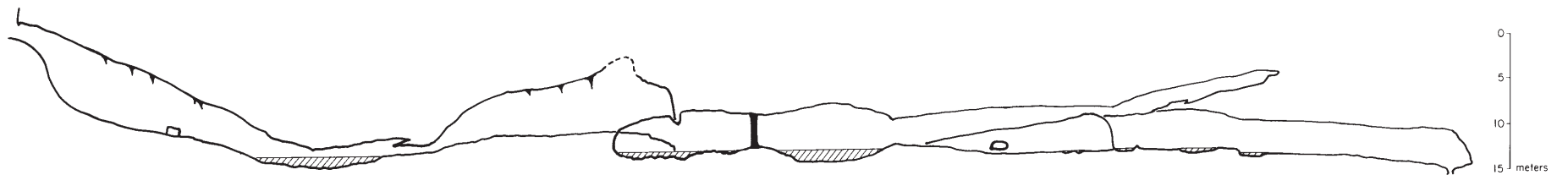
Jeff Robertson

Steve Robertson (Draft)

Plotted by ellipse



EXTENDED PROFILE



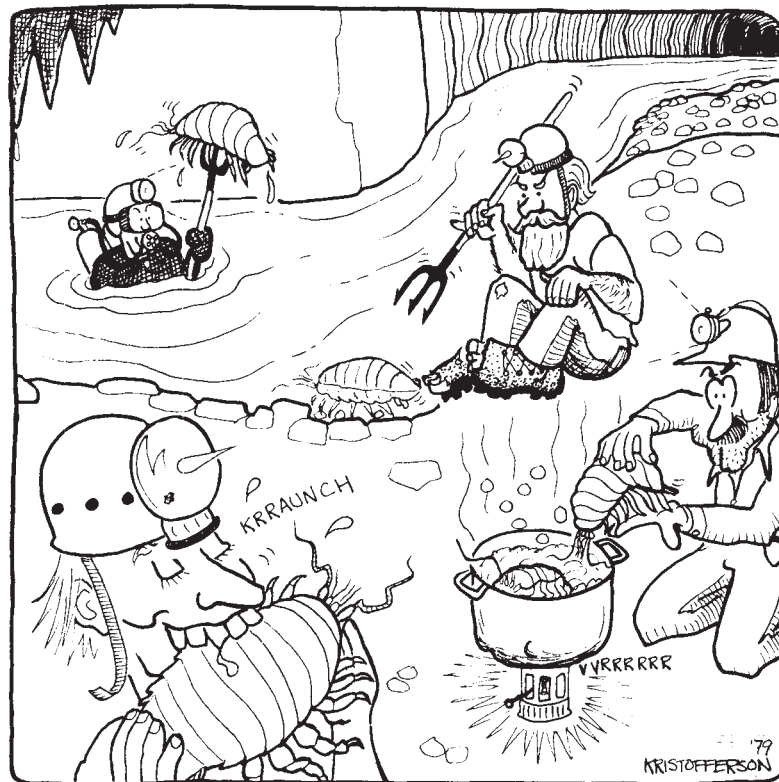
water may be forced into El Túnel when the system is backed up during heavy rainfall. It is thought that normally this water emerges from the Altotoco sump and immediately joins the Río Moyoatl, which then forms the river flowing into the Boquerón. Trips are planned to collect in these rivers in the near future.

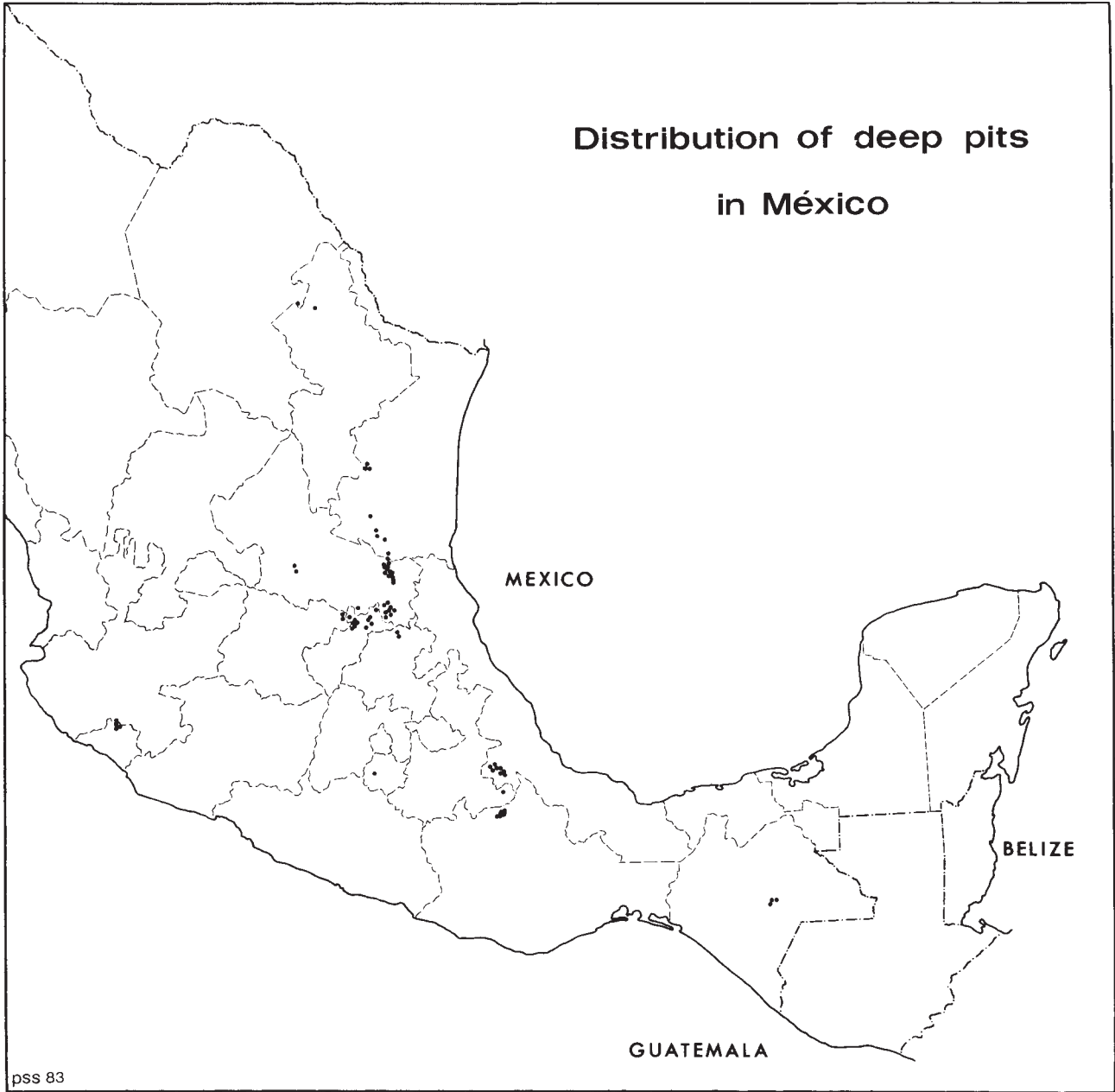


Blind catfish of the genus *Rhamdia* from Veracruz. (Stephen Robertson)

Cueva del Túnel

La Cueva del Túnel es también conocida como Cueva del Ostoc, y se localiza en el área de Zongolica en el estado de Veracruz. Esta cueva es pequeña pero contiene numerosos pozos con agua en las cuales habita el "pezgato" del género *Rhamdia*. Peces ciegos también son encontrados en dos cuevas cercanas: Sumidero de Cotzalostoc y el Sótano de Ahuihuitzcapa.





DEEP PITS OF MEXICO

Peter Sprouse

It perhaps may be said that Mexico is most famous speleologically for its spectacular deep pits. Deep drops were known by Texas cavers as early as 1956, when cavers from the St. Mary's University club in San Antonio visited Cueva de El Abra, seeing the 116-meter skylight drop, but descending only the lower part. Then in 1960, deep pit exploration began in the Xilitla area, when Robert Mitchell and others made a hand-winch descent of Sótano de Huitzmolotitla. This was followed by the exploration of nearby Sótano de San Antonio (118 meters) and Sótano del Pozo (115 meters) in the first half of the 1960s.

In November 1962, one of the first trips by the newly organized Speleological Survey of Mexico, later to become the AMCS, explored deep pits in the Tequila, Veracruz, area. Among these was 111-meter-deep Sótano de El Crucero.

Ventana Jabalfi in the El Abra range was explored by Bill Bell, David McKenzie, and Terry Raines in April 1964. Terry and Bill returned later that year to descend the 153-meter skylight drop, then the longest in the Western Hemisphere. After they rappelled in, they yelled up to their Mexican guide "¡Baja el macate!" and their rope was dropped so they could walk out the horizontal entrance.

In what surely must be one of the most spectacular discovery trips of all time, T.R. Evans, Charles Borland, and Ranald Stearns conducted a reconnaissance west of Aquismón, San Luis Potosí. Upon reaching the edge of Sótano de las Golondrinas, they first thought it to be no more than 100 meters deep. They realized its true depth when a rock dropped in took 10.5 seconds to reach the bottom. Golondrinas remains arguably the most spectacular of the world's shafts, and the 376-meter high-side rappel is still the longest totally freefall drop.

Another pit record was set in

March 1971, when the 288-meter second drop in Sotanito de Ahuacatlán was explored. At the time, it was the deepest shaft inside a cave. The narrow shaft was descended three times with progressively longer ropes before the explorers reached the bottom.

The Sotanito led to the discovery of another pit, 12 kilometers to the northwest: Sótano de El Barro, the deepest in the world at 410 meters. El Sótano, as it is often called, is a huge gaping hole in the side of a mountain. Craig Bittinger and Logan McNatt were guided to the pit on 20 January 1972. On the descent trip eight days later, Craig and Logan simultaneously made the first descents on two ropes.

Since El Sótano, there has been considerable emphasis on long and deep systems, rather than deep pits as such. But in the last few years a number of deep ones have been found. French cavers have explored the 330-meter Sótano Tomasa Kiahua, in the Zongolica region of Veracruz. Nearby, two deep shafts have been explored by Mexican cavers: Alpupuluca (190 meters) and Ahuihuiztcapa (180 meters). Additionally, SMES cavers recently discovered the 233-meter-deep Resumidero del Pozo Blanco in Jalisco.

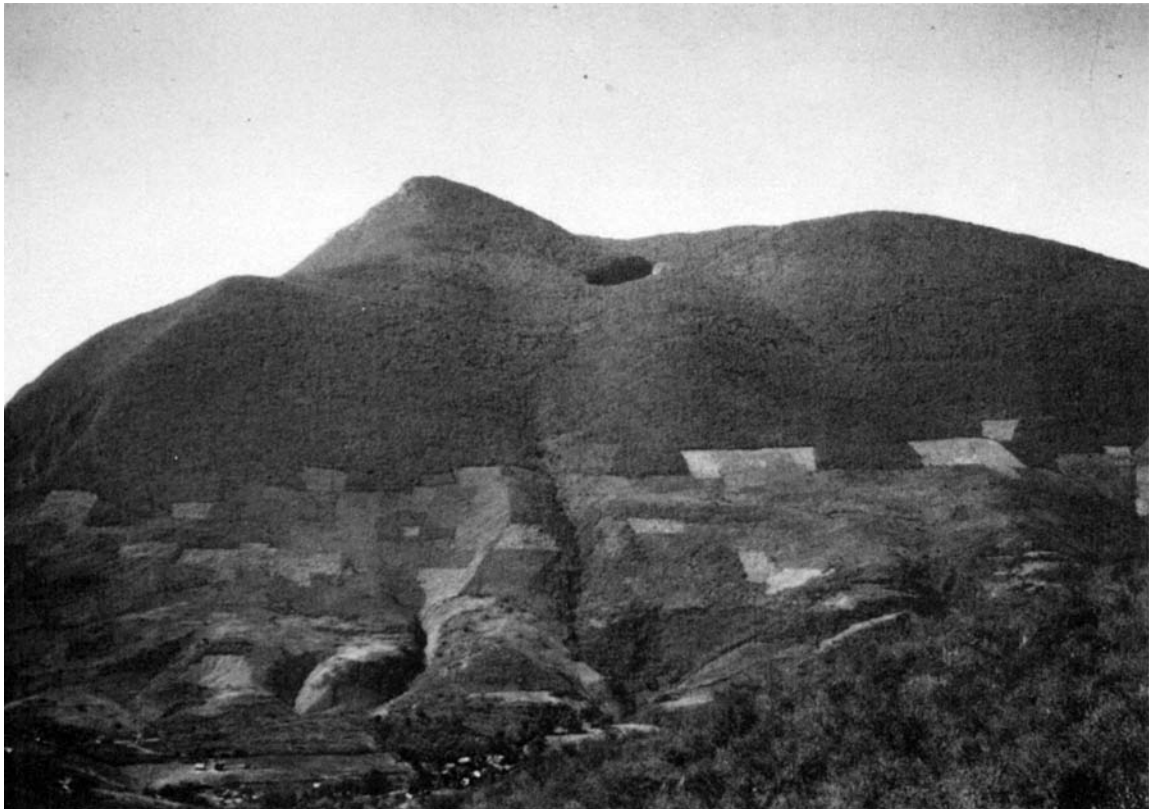
It may seem that no new pit records of any sort are being set these days. But Florida divers have opened up a whole new category with the totally submerged Macho Pit in the Nacimiento del Río Mante, Tamaulipas, which has been descended to a depth of 102 meters.

In the deep pits list, the longest drop is given for each pit, when known. Pits are entrance pits or first drops unless otherwise noted. No strict definitions have been applied in compiling this list, but rather popular acceptance of a pit has been used. Since this list is the first of its kind for Mexico, omissions are inevitable, and corrections and additions will be welcome.

1. El Sótano (Sótano de El Barro)	Querétaro	410
2. Sótano de las Golondrinas	San Luis Potosí	376
3. Sótano Tomasa Kiahua	Veracruz	330
4. Sotanito de Ahuacatlán, second drop	Querétaro	288
5. Resumidero del Pozo Blanco	Jalisco	233
6. Sótano de Coatimundi	San Luis Potosí	219
7. Sótano de Sendero	San Luis Potosí	217
8. Hoya de las Guaguas	San Luis Potosí	202
9. Sótano de Soyate	San Luis Potosí	195
10. Sótano de Alpupuluca	Veracruz	190
11. Sótano de Puerto de los Lobos	San Luis Potosí	189
12. Hoya de la Luz	San Luis Potosí	188
13. Ahuihuiztcapa	Veracruz	180
14. Sótano de la Cuesta	San Luis Potosí	174
15. Sótano de los Monos	San Luis Potosí	171
16. Sótano de Otates	Tamaulipas	171
17. El Socavón	Querétaro	171
18. Sótano de Agua de Carrizo, Flip Pit	Oaxaca	164
19. Ventana Jabalí	San Luis Potosí	153
20. Sótano de Coatituesday	San Luis Potosí	147
21. Sótano de Milpa	Veracruz	146
22. Sótano de Paila	Querétaro	143
23. Sótano de los Guacamayos	Tamaulipas	140
24. Sótano de Río Iglesia, Christmas Shaft	Oaxaca	140
25. Sótano de Gadsden	San Luis Potosí	137
26. Sótano de Agua de Carrizo, Sima Larga	Oaxaca	134
27. Illusive Pit	Coahuila	133
28. Sótano de Otates	Querétaro	133
29. Sótano del Arbol Sangre, second drop	San Luis Potosí	132
30. Sótano de Aguila	Querétaro	128
31. Sima Sin Nombre	Chiapas	128
32. Ch'ensibilmut	Chiapas	126
33. Sótano de Cepillo	San Luis Potosí	126
34. Pozo de Montemayor, fourth drop	Nuevo León	126
35. Pozo de los Lentiscos	Colima	126
36. Sótano de Culebra	San Luis Potosí	125
37. Sótano de Soukup, second drop	San Luis Potosí	125
38. Sótano de la Selva	Querétaro	123
39. Sótano del Rancho El Tigre	Querétaro	122
40. Sótano de San Antonio	San Luis Potosí	118
41. Nita He	Oaxaca	117
42. Cueva de La Peña, fifteenth drop	San Luis Potosí	116
43. Cueva de El Abra, skylight drop	Tamaulipas	116
44. Resumidero de Vizcaino, second drop	Colima	116
45. Sótano del Pozo	San Luis Potosí	115
46. Sótano Hondo	Querétaro	115
47. Sótano de Seis Segundos	Oaxaca	114
48. Sótano de Trueno	San Luis Potosí	114
49. Sótano de las Tres Penurias	Veracruz	113
50. Pozo Oscuro	Tamaulipas	111
51. Sótano de El Crucero	Veracruz	111
52. Sótano de las Guayabas	Guanajuato	111
53. Chen Ulish	Chiapas	110
54. Cueva de San Agustín, seventeenth drop	Oaxaca	109
55. Cueva del Nacimiento del Río Choy	San Luis Potosí	108
56. Sótano de Trinidad	San Luis Potosí	108
57. El Hundido	Tamaulipas	108

DEEP PITS

58. Sótano de los Parandicos	Hidalgo	108
59. Sótano del Profesor	Veracruz	108
60. Sótano de Agua de Carrizo, Son of a Pitch	Oaxaca	107
61. Oztoatlichaloo	Veracruz	107
62. Sótano de Macho Rey	Querétaro	106
63. Sótano de las Virgin	Querétaro	106
64. Sótano P. 106	Hidalgo	106
65. Sótano de Huitzmolotitla	San Luis Potosí	105
66. Sótano de la Palma Real	Querétaro	105
67. Sótano de la Rama	Tamaulipas	105
68. Pozo del Otatillo	Colima	105
69. El Hoyanco	Morelos	105
70. Sótano de San Francisco	San Luis Potosí	104
71. Sótano del Buque, fifth drop	Querétaro	103
72. Nacimiento del Río Mante	Tamaulipas	102
73. Sótano de las Hoyas, second drop	Guanajuato	101
74. Cueva de las Colmenas	Tamaulipas	100
75. Sótano de Coyomeapan	Puebla	100



El Sótano, the world's deepest pit. (Tom Ramsey)



NITA HE

Gerald Atkinson

Nita He (nē'tä hā, meaning deep cave in Mazatec) is located 1.5 kilometers north of the town of San Andrés Hidalgo in the municipio of Huautla de Jiménez, Oaxaca, Mexico. The cave was discovered March 1, 1980 by Jill Dorman, Dino Lowrey, and Janet Steele during a reconnaissance hike in the cone and cockpit karst north of Li Nita. At the base of a steep hillside they located an entrance 10 meters wide by 6 meters high that immediately opened into the top of a large pit. Of all the caves they found that day, this one was the most promising, as rocks bounced for thirteen seconds.

A couple of days later, Jill, Dino, Jim Smith, and Steve Zeman rigged the first few drops of the cave and found the entrance to be a spectacular 117-meter shaft broken by two intermediate ledges. The southwest side of the pit was marked by a prominent fault that could be traced down the entire length of the drop. A short passage at the bottom led to a small hole choked with cobbles and dirt that was blowing a howling gale. Jim dug this, the Vortex, open to reveal a 50-meter offset pit developed along the same fault as the entrance shaft. The cave had picked up a small stream, which was cascad-

Photo: Bob Jefferys rappelling into the Vortex at the bottom of the 117-meter entrance shaft. (Bill Stone)

ing down the drop to disappear over the lip of yet another deep pit. Convinced that Nita He was going somewhere in a hurry, the group left the cave rigged and prusiked out.

On March 12, Jill, Dino, Jim, Steve, and Jerry Atkinson returned to explore and survey beyond the previous exploration. The third drop turned out to be 40 meters deep and opened into the ceiling of a 40-by-20-meter room floored with cobbles and mud. A couple of small, muddy crawlways took off from there, but the water followed a flowstone-encrusted gallery averaging 3 meters wide by 10 meters high. After 150 meters of short pitches and climb-downs, the gallery intersected a much larger stream, which emerged from a breakdown choke some 100 meters upstream. Downstream, the passage continued for 90 meters as a series of cascades and pools, to finally emerge high up the side of an immense dome-pit at -300 meters. Even though the team had electric lights, they were unable to distinguish the ceiling, floor, or walls beyond the edge of the drop. Out of rope, they surveyed back to the -220-meter level and left the cave.

Electric Shaft

On March 17, Jerry, Bob Jefferys, and Doug Powell rerigged the entrance drops with a 200-meter PMI, as the Blue Water was beginning to fray. They surveyed down to the -220-meter level to close the hanging survey. Two days later, Jerry, Doug, Jim, and Bill Steele returned to rig the dome-pit lead. The first new drop of the day was a fine 40-meter pitch that was rigged in the middle of the waterfall. This pitch landed them on a spray-whipped ledge that immediately dropped a few meters and ended at the top of a 20-by-12-meter-wide pit. The stream was gathering in a small trough and then arcing silently into the void. Even though there was the sound of cascading water behind them, they were a bit surprised at not being able to hear the waterfall below. Their surprise turned to elation when small boulders were tossed in, again with no response from below. The pit turned out to be 90 meters deep, essentially free, and rigged by necessity in the stinging waterfall. No one had anticipated the need for a 100-meter rope that day, so a knot had to be passed halfway down. As carbides were fairly useless in the

water, the pitch was dubbed the Electric Shaft.

The base of the Electric Shaft opened into the ceiling of an 80-by-40-meter breakdown-floored chamber 15 meters high, with the water softly sheeting into a 20-meter-long lake. At the far end of the chamber there were two leads, a high climbing lead 10 meters off the floor and a smaller, gorge-like passage reached by threading down through the breakdown to where the stream was found again. Twenty meters beyond this point, the water was lost once more to a narrow rift that was too tight to enter. As no other leads were immediately found, the prospects that the cave would continue were considered fairly dim at the time. A later survey indicated a depth of -510 meters at the rift.

Extension

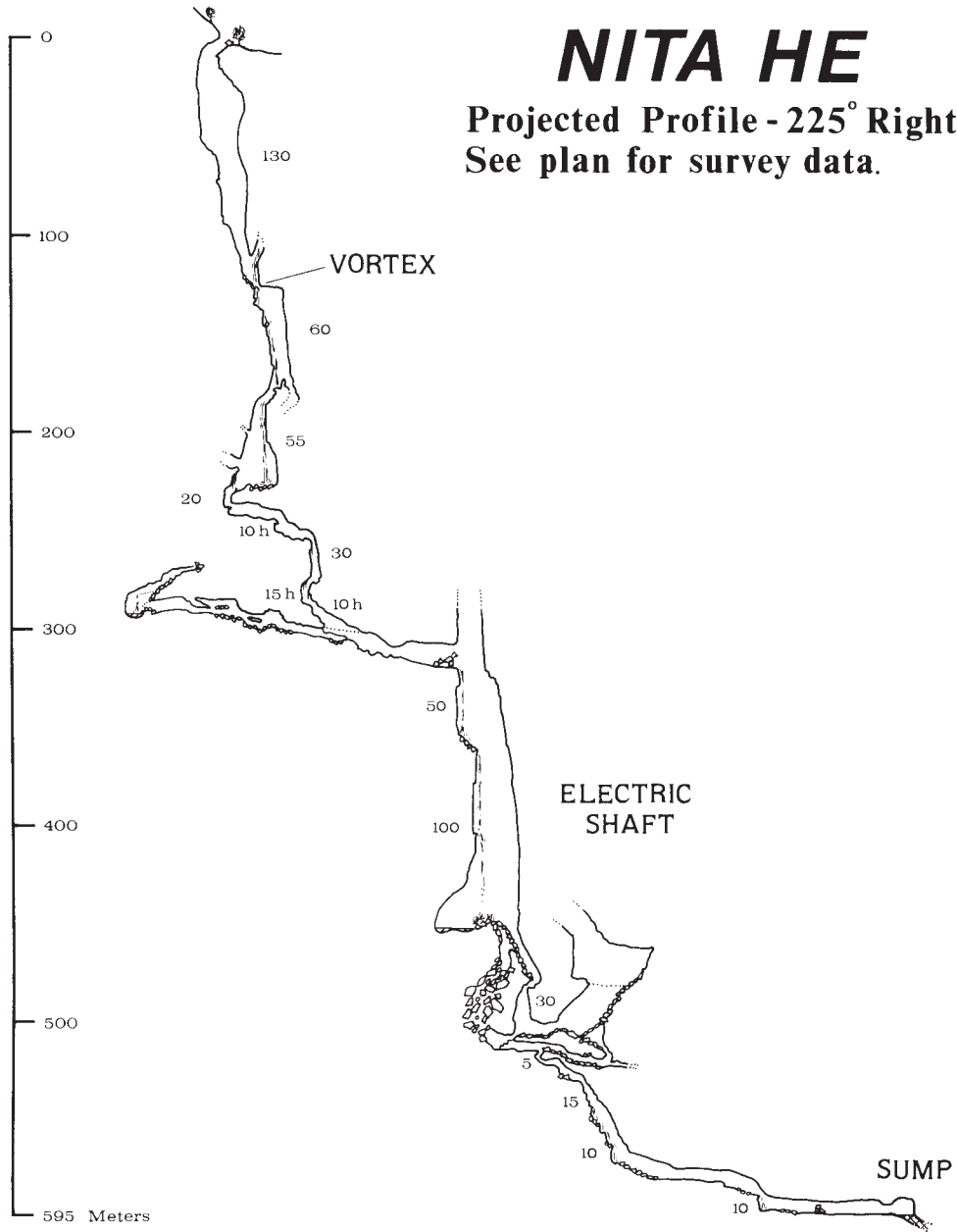
On March 21, Bob Jefferys and Bill Stone descended to the big room at the base of the Electric Shaft to attempt an aid climb to the remaining lead. One bolt, one pin, and a lot of step digging with a rock hammer resulted in their reaching it. They found a wide, low-ceilinged gallery leading to a 25-meter drop. This pitch led to a parallel series of large overflow passages and one 30-by-30-meter chamber 25 meters high and floored with huge breakdown blocks. Two small crawlways connected back to the stream gorge where the previous group had stopped. As they were about to leave, Bill noticed a narrow slot in the breakdown that dropped 6 meters to a 50-meter-long passage. This ended in a pit from which came the roar of the main stream below.

On April 4, Doug, Jim, Steve, Bill Steele, and Ron Simmons returned to Stone and Jefferys's lead with 400 meters of rope and high hopes. Unfortunately, the group followed the stream down 80 meters of climb-downs and small drops to a sump at -595 meters. The only lead they noted was a blowing breakdown choke at the base of the third rope drop.

On April 7, Jerry, Jill, Bob, Ron, Jim, Steve, Bill Bockstiegal, Mark Minton, Bill Steele, and Bill Stone mopped up the survey and derigged the cave. Everything went smoothly until Bill Steele's Kelty was accidentally knocked into the entrance shaft, smashing on a ledge about 90 meters below. Luckily, only an empty carbide bottle made it all the way to the bottom, where a wait-

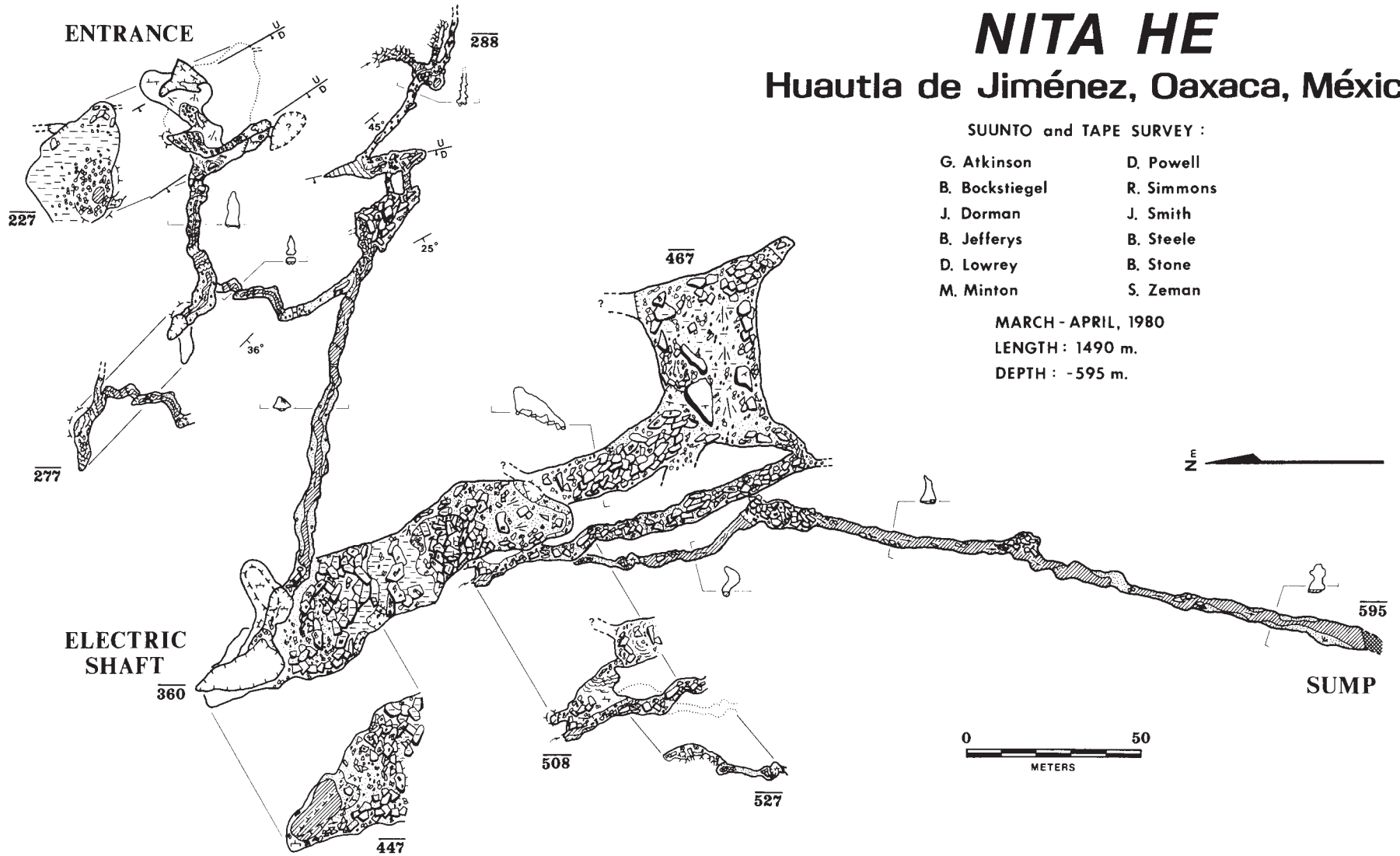
NITA HE

Projected Profile - 225° Right
See plan for survey data.



[Base Profile by B. Stone]

ENTRANCE



NITA HE

Huautla de Jiménez, Oaxaca, México

SUUNTO and TAPE SURVEY :

- | | |
|----------------|------------|
| G. Atkinson | D. Powell |
| B. Bockstiegel | R. Simmons |
| J. Dorman | J. Smith |
| B. Jefferys | B. Steele |
| D. Lowrey | B. Stone |
| M. Minton | S. Zeman |

MARCH - APRIL, 1980

LENGTH : 1490 m.

DEPTH : -595 m.



ing Steele recognized it as his own.

More Cave?

The surveyed length of Nita He now stands at 1490 meters, with a depth of -595 meters. A few side leads remain; the most promising is

the breakdown and air choke at -560 meters, which may be an overflow route. Considering the large size of the passage, the way most caves in the Huautla area develop, and the amount of air and water movement in the cave, it would be surprising if Nita He is truly finished.



↑ The third pitch at -220 meters in Nita He. (Bill Stone)
→ Prusiking up the final drop in Nita He (-580m). (Ron Simmons)



Nita He

La Cueva de Nita He está localizado a solo 1.5 kilometros al norte de San Andres Hidalgo en el municipio de Huautla de Jiménez, Oaxaca. Dicha caverna fue topografiada y encontrada por miembros del Proyecto Huautla en marzo de 1980. La cueva tiene -595 metros de profundidad, y 1490 metros de longitud. La entrada es vertical y la mas profunda en la cueva (-117 metros) y se desarrolla en una prominente valle. Una pequeña corriente es encontrada en el fondo del segundo tiro y 200 metros abajo se encuentra un corriente más grande. La cueva termina en un sifón a menos 595 metros aun quedan algunos pasajes secundarios por explorar sin embargo. La continua corriente de aire sugiere una más profunda exploración.

the legend of Boruhuitz

The hillside climbs four thousand feet from valley floor to high plateau and on its side a dark green V, a verdant patch of pubic hair, a woman on the slope. Below the V a canyon, smooth as legs, slithers softly down to flatlands far below. A mule trail twists and turns through trees and tan back-broken stalks of sun-dried maize and flowers waving in the wind, and climbs and climbs and climbs. A level stretch and then a step inside a green cathedral. Hidden there a high white wall of layered limestone overhead, a pubic arch, stands guard above the gaping maw of Mother Earth. A thousand stalactites hang about like snagged teeth, while a moss-green carpet grows upon the ground and stumbles down a hundred steps of time-worn travertine, little dams of crystal formed when water fell and tumbled trickling down to fall and fall again. Beside them in the sun an earthen pot, many centuries old and calcite-covered several inches thick, traps holy water dripping from above--or maybe not so holy, magic (encantada), local people say! You drink a cupful just to ease your mind. One can't take chances in a cave like this.

Far below a sandy floor stretched wall to wall; the gaping mouth arched down and met the ground. Far to the left behind a broken breakdown block a passage leads, it's said, into the depths of hell. A person coming here can talk, and trade or even sell his soul, or maybe just ask some advice. Brujas, sorcerers, or those with evil eye come here to see the man--the

Devil! The Devil? What's to say? The Devil does what devils do.

But, on the right side of the cave, climb frozen stone cascades below a fire-blackened sloping slot where only brave believers go to speak with God, and God speaks back. Yes, they say, it's God, and here in Boruhuitz He speaks and tells you what to do--but there's a catch: not even God will give advice without a well-planned trick or two.

Quaking scared but satisfied that God would hear their humble prayers they turned to go out of the cave. But magic rays of sun broke through the trees outside and found their ways among the entrance stairstep dams. A steaming mist arose as sunbeams flickered ghostly to the floor. Beware! For all is not quite as it seems: these rays they hold a curse. They say that when returning from the talk with spirits down below, you must drink the holy water again. And you must not allow even one small ray of light to fall upon you--DEATH. It's true. She said she'd known of many. Crossed herself. Several people looked around and rolled their eyes and shook their heads. They'd never even heard of one. It's true, she said again and crossed herself. I know. I've been there, heard and talked to God. It's true. The others laughed and grinned and shook their heads. It's just Marcelo, they all said.

Gill Ediger

Sótano de Las Calenturas

Dale L. Pate

At the base of high limestone cliffs, the Nacimiento del Río Corona flows from a deep pool, beginning its long journey. With added flow from the Nacimiento de San Antonio, the Río Corona carves the deep, beautiful Cañon el Olmo through the front ranges of the Sierra Madre Oriental on its fall to the Gulf of Mexico. Like most rivers and springs that flow from these high, rugged mountains, the river and its surroundings are a wilderness paradise.

Sótano de Las Calenturas is situated 140 meters above and 1500 meters south of these springs, at an elevation of 1,455 meters. It is located amid a pine forest near the logging village of Yerbabuena in the state of Tamaulipas, Mexico. The first caverns to enter this general area were John Mikels, Mike Padgett, and other members of the Pan American Speleological Society, in May 1973. They were passing through, searching for a large sinkhole they had spotted from the air. This was El Hundido, a large open-air pit with an entrance pitch of 108 meters. It was two years later, in May 1975, when Charles Fromen, Mike Connolly, Sheila Balsdon, and others from the Houston Grotto drove through Yerbabuena itself looking for caves. Calenturas was one of the names on a list of caves the locals told Charles about.

Soon afterwards, Proyecto Espeleológico Purificación workers had begun a massive project to explore and document the caves of this high karst region of Mexico. On March 22, 1979, Peter Sprouse, Terri Sprouse, Mark Shumate, Jerry Atkinson, Leslie Turpin, and I hiked into Yerbabuena looking for caves. We had spent the day hiking from Conrado Castillo, 8 kilometers to the north. The following day we were shown a large pit with an arroyo emptying into it. This was Sótano de Las Calenturas. A brief look by Mark and Jerry indicated that, indeed, the cave was large, and it had four major leads. We would definitely return.

The Survey Begins

On November 18, 1979, Paul Fambro, Jerry Atkinson, Peter Strickland, Leslie Clarfield, Jeff Horowitz, Terri Sprouse, Peter Sprouse, Mark Shumate, Louise Hose, Joseph Lieberz, David McKenzie, James Reddell, Sheila Balsdon, Frank Endres, Elizabeth Ross, and I drove into Yerbabuena and acquired permission from the jefe to camp near Calenturas and also to explore in the caves of the area. Our camp was located 100 meters to the north of Sótano de Las Calenturas. Our week-long expedition produced significant results. Each day we were able to send at least a couple of teams into the cave, though considerable time was also spent exploring and mapping other caves in the area. Nacimiento de San Antonio was located, and the cave there was explored and mapped, as were Cueva del Arado and Cueva los Arquitos. Exploration and mapping were also begun in Cueva de Tecolote in nearby Los San Pedro.

The entrance drop of Sótano de Las Calenturas is 22 meters deep and falls into a fairly large chamber, 30 meters by 50 meters. This chamber leads off in four directions. To the east, a passage leads down fairly steep cobble slopes to a sump, Lake Louise. To the south, the passage continues large, 30 meters wide, for another 60 meters before ending; this section is called Kingdom Kong. To the north, the Cobble Factory, a passage with thousands of rounded cobbles lining the floor, runs for 120 meters to the Wall of Jericho; at this climbdown the passage begins to widen until, at its widest, it is 20 meters in width and, in places, 25 meters high. This passage ends in the Sand Sump, a sand-filled continuation with air blowing through a small channel near the ceiling. A small passage, Mango Downs, runs off from this passage to a 10-meter pit that was not explored.

The last passage from the entrance leads to the northwest, where at one point a large log 10 meters long, the Captain's Log, lies wedged between two walls. Beyond this, the

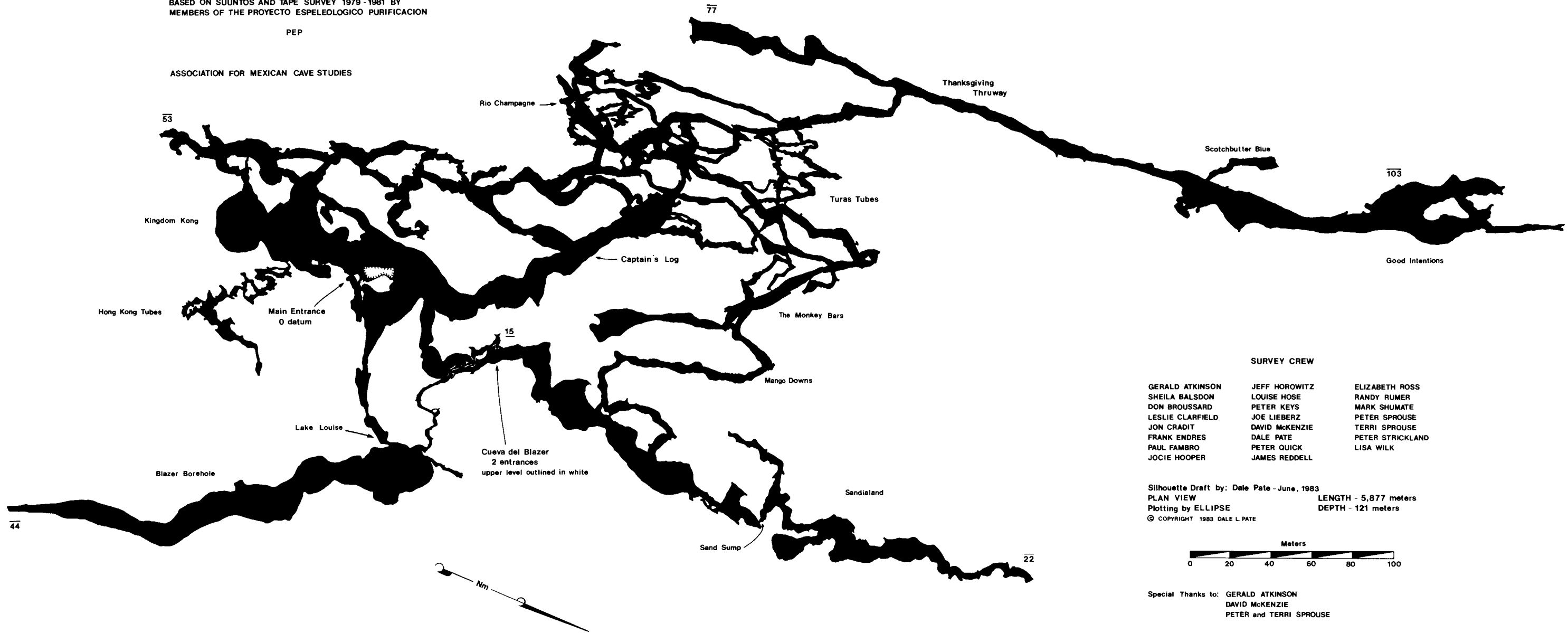
SOTANO DE LAS CALENTURAS

TAMAULIPAS, MEXICO

BASED ON SUUNTOS AND TAPE SURVEY 1979 - 1981 BY
MEMBERS OF THE PROYECTO ESPELEOLOGICO PURIFICACION

PEP

ASSOCIATION FOR MEXICAN CAVE STUDIES



SURVEY CREW

- | | | |
|------------------|----------------|------------------|
| GERALD ATKINSON | JEFF HOROWITZ | ELIZABETH ROSS |
| SHEILA BALSDON | LOUISE HOSE | RANDY RUMER |
| DON BROUSSARD | PETER KEYS | MARK SHUMATE |
| LESLIE CLARFIELD | JOE LIEBERZ | PETER SPROUSE |
| JON CRADIT | DAVID MCKENZIE | TERRI SPROUSE |
| FRANK ENDRES | DALE PATE | PETER STRICKLAND |
| PAUL FAMBRO | PETER QUICK | LISA WILK |
| JOCIE HOOPER | JAMES REDDELL | |

Silhouette Draft by: Dale Pate - June, 1983
 PLAN VIEW LENGTH - 5,877 meters
 Plotting by ELLIPSE DEPTH - 121 meters
 © COPYRIGHT 1983 DALE L. PATE



Special Thanks to: GERALD ATKINSON
 DAVID MCKENZIE
 PETER and TERRI SPROUSE

passage splits and enters a very mazy section of cave called the Turas Tubes. Forays into this area produced a small stream named the Río Champagne in a passage with well-scoured walls, more upper-level maze passages with pits, and many meters of survey. Jerry, Peter Strickland, and Louise finally broke through the tubes and discovered the Thanksgiving Thruway, a major north-south trending passage that appears to carry the flood waters for the lowest sections of the cave. Near its northern end, the passage attains a size of 20 by 25 meters before plunging down a 23-meter drop. Pete rappelled down this drop and was unable to explore further after slipping and cutting his hand on the sharp rock.

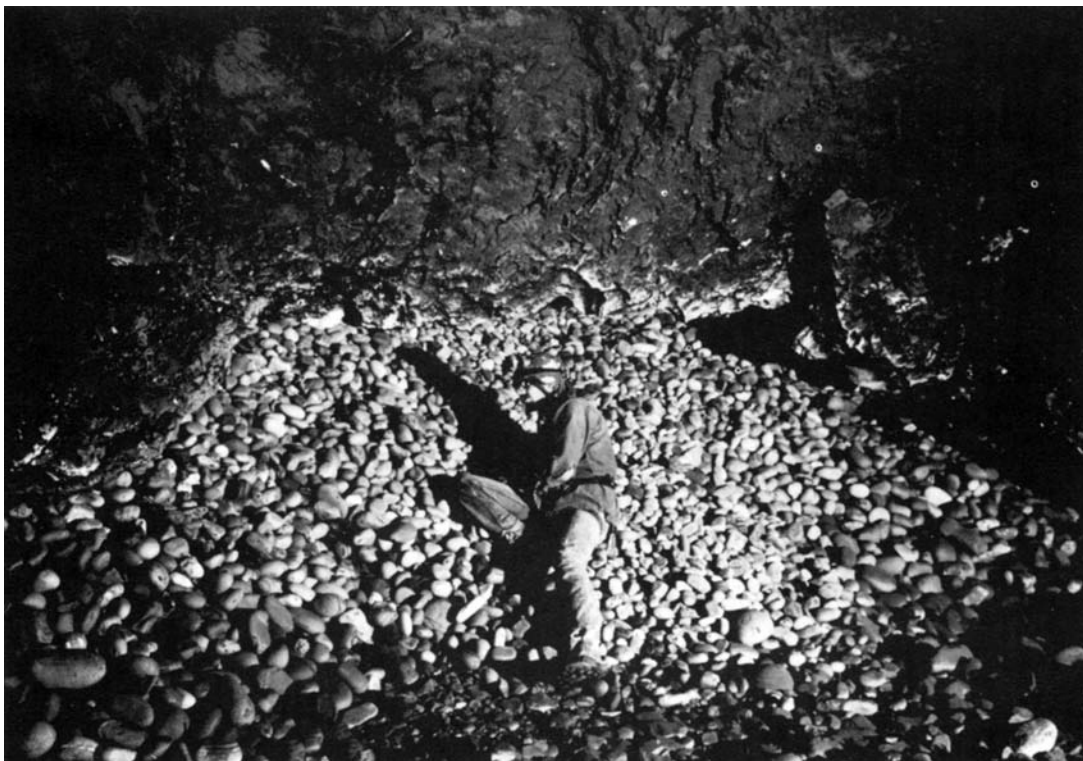
The same day that the Thanksgiving Thruway was discovered, Peter Sprouse, Terri, and James began the exploration and mapping of Cueva del Blazer, a small crawlway cave right next to where David's Blazer was parked. After mapping 150 meters, James reported that the crawlway ended in a pit that looked down into blackness, and he could hear a stream flowing somewhere down below. The crawl had ended at a 32-meter pit, the Crank Shaft, that comes down in

the middle of a large passage running north-south. To the south, the passage turned abruptly and became a lake with a small air space. Peter Sprouse, Sheila, and Joseph returned to this Blazer Borehole to finish the survey the following day. By coincidence, Terri had gone into Calenturas and had stopped by Lake Louise, where she heard voices on the other side. A connection had been made. To the south, Blazer Borehole ran for several hundred meters before turning downward and sumping out.

This first week-long expedition netted 3,438 meters of mostly walking passage, and we left several good leads.

Second Push

Another trip to Calenturas lasted from April 23 to April 28, 1980. On the trip were Jerry Atkinson, Leslie Clarfield, David Honea, Peter Keys, Don Broussard, Randy Rumer, Lisa Wilk, Peter Sprouse, Terri Sprouse, Peter Quick, Jeanne Williams, Louise Hose, and I. The two main leads we had come to push had great potential, and these were tackled first. The pit in Mango Downs emp-



Jerry Atkinson in The Cobble Factory, Calenturas. (Terri Sprouse)



Onza Falls in Sandia-
land, Calenturas.
(Terri Sprouse)

tied into a broad passage 6 meters wide and 8 meters high, with deep, well-scoured tinajas, many with holes broken out in their sides. The entire passage was worn smooth by the eons of flood waters. The passage was aptly named the Monkey Bars. To the west, this passage became harder to traverse, and a final climb-down led to a survey station left by the Thanksgiving crew. The Río Champagne was just a short distance away. From back at the rope drop, the passage extended to the east until sumping out in a deep, wide pool, Mango Sump.

The other main lead was the large drop at the end of the Thanksgiving Thruway. A large lake just beyond this drop, Turkey Sump, was pushed to a split in the passage. Both ways got smaller; one led to a sump, and the other pinched out in flowstone. The Turas Tubes were also a focal point of exploration and surveying in Calenturas. Every team had its own section of Tubes. A total of 1,463 meters of passage was added to the survey, bringing the total length of the cave to 4,901 meters. Total depth was 121 meters.

Also during this week, two separate teams tried to reach the Nacimiento del Río Corona, but were unsuccessful. Both were stopped by high cliffs.

1981 Expedition

No one returned to the Calenturas area until April 2, 1981, when Jerry Atkinson and Andy Waddington hiked to the cliffs overlooking the Nacimiento del Río Corona for reconnaissance. Jerry returned to these cliffs with Jocie Hooper, Pete Strickland, Jon Cradit, and Jeff Horowitz on November 23, 1981, and they did succeed in reaching the nacimiento. A large, deep pool and a sump confronted them. More mapping was done in Calenturas during this Thanksgiving period. Along on the trip were Jocie Hooper, Pete Strickland, Jerry Atkinson, Peter Sprouse, Terri Sprouse, Jon Cradit, Jeff Horowitz, Susan Raines, Terry Raines, and Mark Shumate. One major objective of this trip was the Sand Sump at the end of the Great Mud Room. With the help of wood shoring, the sand was dug away, and several hundred meters of large passage was explored and mapped in Sandialand. More tubes were mapped in the Turas Tubes, and a new area of tubes was discovered off the Kingdom Kong area. These are the Hong Kong Tubes, which don't appear to be as complex as the Turas Tubes. This expedition brought the total length of the cave to 5,877 meters; it remains 121 meters deep.

Activities other than explora-



Graded cobble slopes near the entrance of Calenturas. (Terry Raines)



Main streamway to the north of the entrance of Calenturas. (Terry Raines)

tion and surveying have included photography and the collection of cave fauna. Three new species of millipedes, a new cirolanid isopod, and one new species of trechine beetle, all of which are troglobitic, have been described from the collections made in Calenturas so far. Many thanks to Peter and Terri Sprouse, Jerry Atkinson, and David McKenzie for their continued assistance in preparing this article and map. The studies continue....

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Sótano de Las Calenturas

Sótano de Las Calenturas es una cueva de grandes dimensiones, encontrada en el area de estudio del Proyecto Espeleológico Purificación. Dicho caverna se encuentra en el poblado de Yerbabuena, estado de Tamaulipas, y por primera vez fue mostrada a espeleólogos por los nativos de la region en Marzo de 1979. La entrada consiste en un tiro vertical. En el cual se precipita un arroyo. Dentro del pasaje principal del cual se derivan cuatro pasajes secundarios. La exploración y mapeo comenzo en Noviembre del mismo año. Actualmente la cueva mide 5877 de longitud y 121 metros de profundidad. Dos resurgencias se ha localizado a 140 metros de desnivel y 1500 metros al este de Calenturas. Posiblemente estas dos son las resurgencias sin embargo ambas terminan en una boveda sifonada.

Cueva Ayockal

Peter Bosted

It was in early January 1982 when eight members of the Western Region 1982 Mexico Expedition, led by Steve Knutson, gathered in the small town of Xochitlán del R.R., near Cuetzalan, Puebla. The crew was made up of Bill Bockstiegel, Bill Liebman, Jim Pisarowicz, Todd Rasmussen, Randy Spahl, Dave Walker, Steve, and me. We were fortunate in being given a house to stay in by Don Carlos Gomez, a local coffee grower. The main focus of the trip was the exploration of Sumidero Santa Elena (see Mexico News), a large river cave nearby, but, shortly after we arrived, Carlos's son Moses showed us a resurgence cave whose stream joins up with a surface stream and enters Santa Elena 500 meters further downstream. The convenient five-minute walk across lush fields riddled with sinkholes and karst outcrops, along a trail heading northeast from the northeastern end of town, tempted some of us to explore a bit and see where this stream came from.

Cueva Ayockal

On the first day of exploration, Randy and I entered the resurgence and began mapping upstream. We followed a relatively spacious passage filled with cobbles, breakdown, and shallow pools until the ceiling suddenly lowered at a point where the main stream has been pirated by a small crawlway on the left. Looking back, the reflection of the sun striking the thick verdant foliage hanging above the dam at the entrance made us a lovely view. Rather than crawl in the water, we followed the breeze, and soon came to the Junction Room, where extensive collapse has taken place at the intersection of two joints. Heading north along a narrow fissure, we soon found the Twin Domes, which are impressively tall. A small waterfall splattered down one of them. We noticed several crosses and initials scratched in the wall here, proving that we were not the first in this part of the cave.

The Boring Hole

We then headed northeast from the Junction Room, coming upon the Fossil Trunk Passage, which is roomy and has some colorful flowstone. We crossed over several holes and a long slot that led down to the newer trunk passage about 10 meters below. After this, the passage suddenly turned back to the north, and, after passing a waterfall that plunges into a pool with a hidden outlet, we suddenly found ourselves looking down a sheer 8-meter drop into the Boring Hole. We went back to the slot and climbed down to the lower level. The hydrology is fairly complex here. At the base of the slot an inlet comes in, presumably from the pool in the Fossil Trunk above, meanders across the large cobble-strewn passage, and wanders into a sump. Thirty meters to the northeast one encounters the main stream where it disappears into a crawlway heading towards the Junction Room. It looks like part of it continues straight in flood conditions. Another 30 meters upstream, one encounters an inlet from the Washbasin Domes, so named for the green algae covering the 5-meter climb up to the domes themselves. From here we continued up the Boring Hole until we came to a pool that was over our heads and had a small waterfall at the far end. Preferring to return later with full wetsuits, we decided to map the Bypass Crawl off of the Junction Room. After going for what seemed like a real long way, I looked at the notes and said, "You know, we must be pretty close to the entrance here." Randy decided to be brave and squeeze through a low, wet, muddy spot, which we discovered, to our relief, led us right back to the entrance.

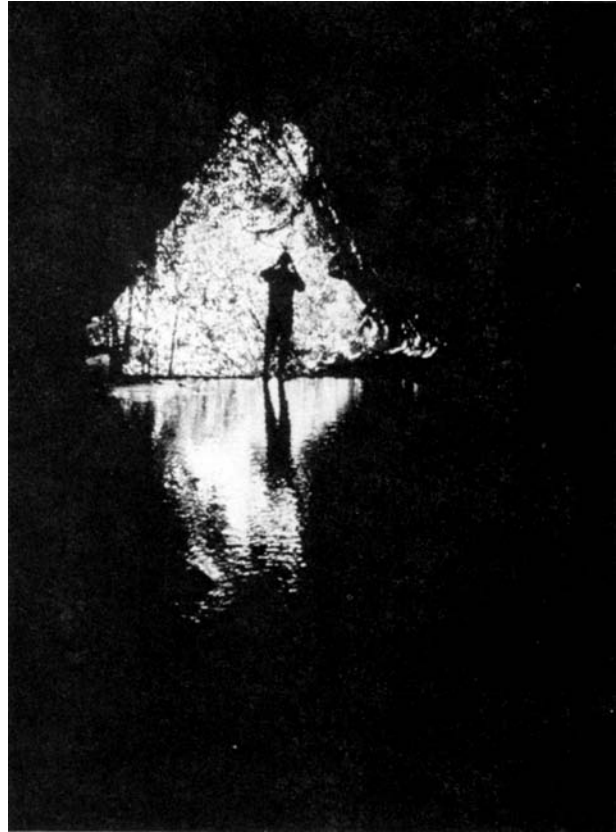
On the next major trip, Randy and I were joined by Jim and Axel Mahler, who was visiting from Germany. We had brought full wetsuits, so Randy immediately found a way to bypass the deep pool in the Boring Hole, but we all swam through it anyway to

cool off. We ran out a dozen or so 30-meter shots down the Boring Hole passage, which is apparently formed along the strike of the bedding planes. At low water, the stream meandered, through occasional large breakdown blocks, over cobbles and sand, occasionally undercutting the walls on either side. We passed a small dripping dome on the right, then arrived at a large breakdown complex with two entrances far above us. When we looked at these entrances from the surface, we found they were at the bottom of a very large sinkhole filled with nasty mala mujer trees, so we called them the Mala Mujer Entrances.

Streams and Dead Cows

Poking around for a while, we soon realized that we were at the junction of several tributaries with the main stream. Following the latter, we found the going getting rougher and rougher, as the passage became filled with breakdown, until finally we came to a spot where the stream gushed from an impenetrable crack. We then decided to follow one of the tributaries, in the Cascading Kaleidoscope Passage, so named for the frequent small waterfalls that pour over black glistening rock into pools that are often chest-deep. We noticed we were now climbing up dip instead of along the strike. Axel and Randy eventually left to take pictures, but Jim and I pushed on as the passage became lower and narrower, often being filled almost to the ceiling with breakdown. The walls became yellowish and crumbly, with black cherty layers, popcorn, and many dry stubby stalagmites. When we got to a very small crawlway half filled with water, I asked Jim, "Are you sure you want to see where this stream comes from?" Unruffled, he replied, "We can't stop now. Look how straight this crawlway is. We'll get a 15-meter shot for sure!" Jim's perseverance paid off, for after a bit more nastiness we popped back into decent-size passage, which soon climbed up to the base of a 20-meter pit entrance with the gleaming white bones of a dead cow at its base. We found another pit entrance nearby, but by then we were out of survey paper. "Gee," commented Jim, "we ought to be able to find these two entrances on the surface, rappel in, and continue the survey that way."

The next day Jim, Randy, and I



Resurgence entrance of Cueva Ayockal. (Peter Bosted)

tried out Jim's idea. We soon found two holes that looked about the right distance apart. We rappelled in one, about 20 meters deep, but after we'd explored 100 meters or so of tight passage it soon became obvious we'd hit the wrong one. Actually, we were in the eastern-most of the Triple Pits, as we discovered later when we did a surface survey. This survey also allowed us to accurately locate the Dead Cow Domes, which we eventually did rappel into, only to find that the passage soon ended in a lot of breakdown in a narrow fissure with 10-meter roots hanging in it. Back on the surface, we found that we had run into a valley, and so we concluded that more passage in this direction was not likely.

Insurgence Connection

Meanwhile, Bill Liebman and Todd had found the insurgence for the main stream, which enters at the base of a 10-meter cliff. Outside, the stream flows over shining white limestone with nice green moss. Inside the cave, they found the stream flow-



Dead Cow Dome. (Peter Bosted)

ing down a large breakdown-filled gallery and suddenly disappearing into an impassable crack. A dry parallel passage to the left showed that the stream had migrated down dip. A small tributary came in from the left, so they followed it for 100 meters to a near sump, which they didn't want to do without wetsuits. In fact, the passage, with only 10 centimeters of airspace, was so uninviting that Randy and I, when we returned later to map this section of the cave, didn't want to do it either, even with wetsuits on. We should have, though, for when the data were plotted up back in town, we found we had been only 10 meters from the Mala Mujer Entrances.

Returning to that area via the Resurgence Entrance a few days later, I plopped with great confidence into a pool where the plot said the Near Sump Crawl should be. Instead, I found the Surprise Passage, which is similar in character to the Cascading Kaleidoscope Passage, although not as hard on the body. Randy and I mapped this to find an end at a tall waterfall. It seems possible that this could be the same little stream

that flows through the passage at the base of the Triple Pit we had mistakenly dropped before, which is only a few hundred meters to the south. We returned to the Mala Mujer, and this time I found the right pool to squirm through to join the Near Sump Crawl, only 10 meters from where it was supposed to be. It wasn't Flint Ridge to Mammoth, but we had our connection.

On various other trips we mapped several side passages, bringing the total length to 2,702 meters. Some of the more notable ones were the Main Stream Crawl, which is extremely wet but has a lead with a bucket in it and lots of air movement, the Hidden Entrance Passage, which has many bats and emerges in a clump of bushes just above the Resurgence Entrance, and the Popcorn Passage, with its sharp prickly walls that tore our clothes to shreds and a tantalizing lead where it ends at a small dome.

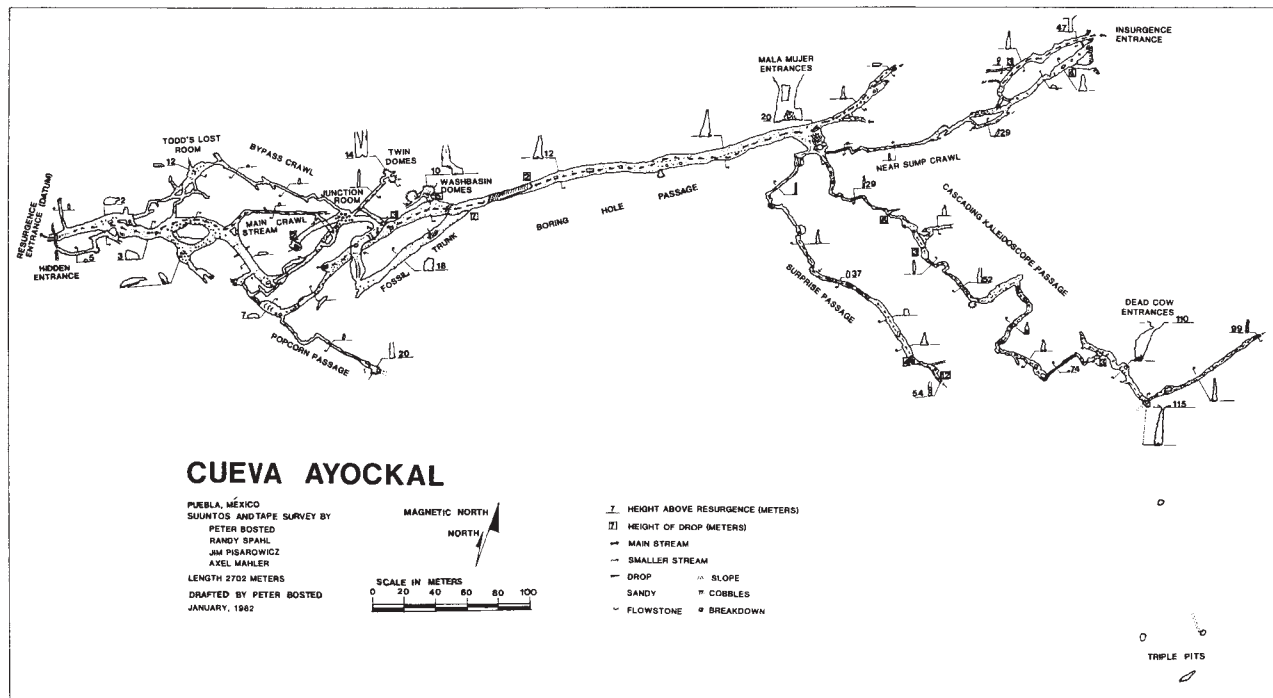
Stream Observations

One day when the water was at its lowest point of our stay, Todd took his gauging equipment into the cave to learn more about the hydrology of the area. He measured flow rates of 2 liters per second in both the Cascading Kaleidoscope and Surprise passages, 9 liters per second in the main stream above the Mala Mujer, and 11 liters per second below that point. The measurements have an estimated 20 percent error. The difference between this and the 18 liters per second measured at the resurgence can be accounted for by the many inlets in between, such as the Twin Domes, Popcorn Passage, Washbasin Domes, Fossil Trunk, and Todd's Lost Room inlets. It is interesting to note that the passage sizes seem well correlated with the stream volumes, and major collapse areas seem to occur principally at stream intersections. On the day the rates were gauged, the Ayockal resurgence accounted for about one fifth of the water entering Santa Elena and about one thirtieth of the flow from the presumed resurgence into the Río Ateno. One might therefore conclude that even relatively small streams can make substantial cave passages in this area, most of them presumably still waiting to be discovered.

Although of relatively modest proportions, Cueva Ayockal is fun and interesting to explore. Ropes

are required only if one of the four pit entrances is used. Wetsuits may be desired in some of the wetter passages. A few small leads remain, and a connection with the Triple Pits

would seem likely, at least hydrologically. With any luck, we'll be back next year to check out some of these possibilities.



Cueva Ayockal

La Cueva de Ayockal se localiza cerca del poblado de Cuetzalan en el estado de Puebla. Su resurgencia se conecta a la corriente que se resume en el Sumidero Santa Elena, mas o menos 500 metros río abajo. The Western Region del NSS realizó una expedición en 1982, mapeando sobre 2 kilometros de pasaje, planeando la exploración de pasajes secundarios posteriormente. Al lado de Ayockal se encuentran tambien cuatro tiros.

Hydrothermal Caving:

GRUTAS DE TOLANTONGO

George Veni

It began in December of 1979, when Scott Harden, Gary Poole, and I were touring through some nice caving areas in the Mexican interior. After visiting Xilitla and finding a new 100-meter pit in the Hidalgo highlands (see *Activities Newsletter* no. 11), we eventually made our way to the Hidalgo lowlands to check out a cave called Grutas de Tolantongo. Scott had this wonderful little book that describes all sorts of interesting places to visit off the well-beaten tourist trail in Mexico. In it Tolantongo is described as a fair-sized hot-water cave located at the base of a deep canyon near the town of Ixmiquilpan. When we arrived in town, one of the first sights to greet us was an old rusty sign, "GTS. TOLANTONGO." A series of these signs led us through Ixmiquilpan to a northbound road. Twenty kilometers later we turned at another sign and followed a dirt road another 20 kilometers to the rim of the 600-meter-deep Cañon de Tolantongo. According to Scott's book, we now had to hike 8 kilometers down to the cave. Not having our hiking feet on that day, we were relieved to find that a road had been built. This steep, narrow, and sinuous typically Mexican thoroughfare was not built with acrophobic drivers and passengers in mind. Eventually we made it all the way down, paid our 10-peso entrance fee into the camping-resort park, and were off to see the cave.

Into Hot Water

Grutas de Tolantongo was a unique and visually spectacular cave. The thin blue-white line of water and the faint rumbling we had observed at the top of the canyon were now seen as a roaring river emerging from the mouth of the cave. The stark desert landscape 600 meters above was forgotten in this lush

tropical setting. To enter the cave, it was necessary to traverse the river, and it was here that the 37-degree-Celsius (100°F) heat was first experienced.

Stepping into the first chamber, we were struck not only by the tremendous heat and humidity, but also by the varied manifestations of water. It poured down the walls, flowed furiously over the floor, and shot out of holes in the walls and ceiling. The most prominent feature of this chamber was a centrally located 10-meter-high downspout. Who stuck an open fire hydrant up there?

Childhood was relived as we played in the water. In a short while, that curiosity of youth nudged us forward to explore deeper into the cave. The water came from a 2.5-meter-wide passage that opened into another room. This narrow passage kicked up the water velocity, and, combined with a small waterfall less than a meter high, it thwarted all our efforts to get into that second chamber. Soon we were again on the road in search of adventures elsewhere.

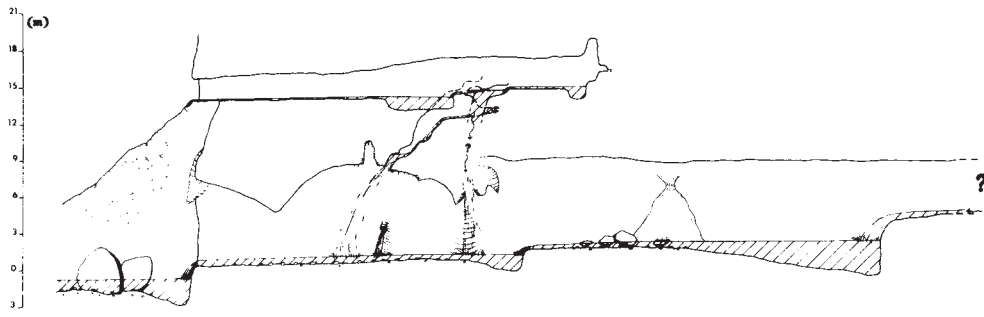
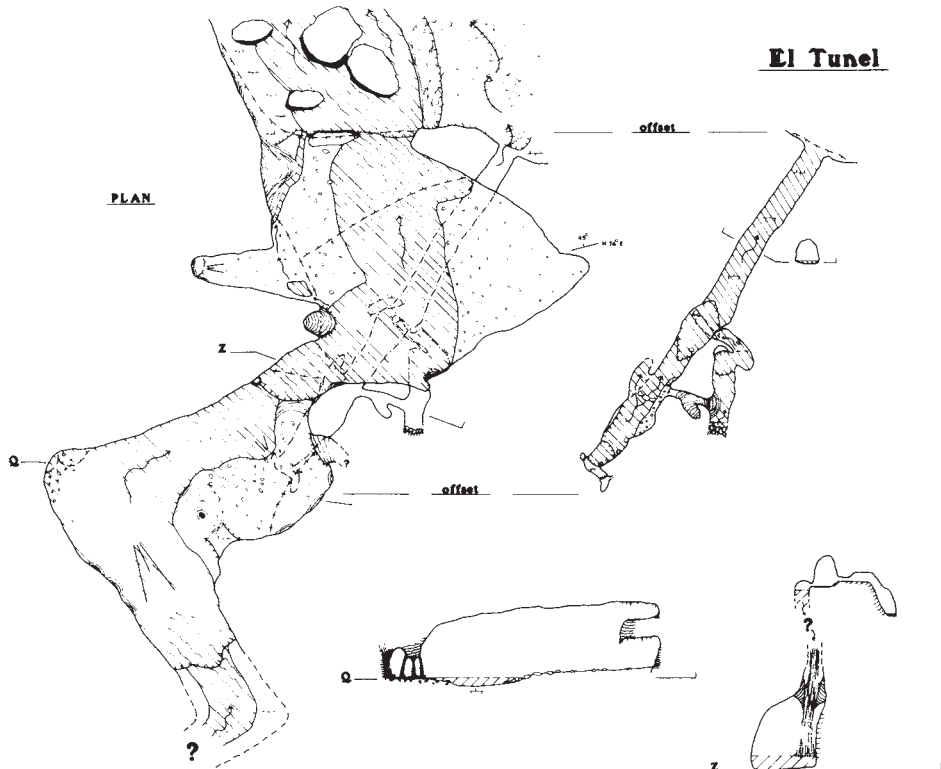
The Survey

Two years later, I was playing the role of third-year geology student and thought that Tolantongo would make an interesting study. Little did I realize how much it would teach me and that it would develop into an undergraduate thesis. I was also very fortunate in that a lot of good people donated equipment and ideas to help the study along. In December 1981, a mini-expedition left San Antonio, Texas, for the cave. Inside the first of the two white VW vans were Gary Poole, Eric Short, and I, and following us were Dottie and Kirsten Kern and Eri Weinstein.

Our first job was, of course, to

Grutas de Tolantongo
Municipio de Cardonal; Hidalgo, Mexico

Suunto & Tape Survey: Dec. 1981 © '82
Dottie Kern Eric Short
Gary A. Poole George Veni, draft.



IDEALIZED PROFILE

survey the cave. This was complicated, though, by the thundering of the Río Tolantongo. Verbal communication was impossible, so we just did a two-man survey. I did a complete sketch and then placed points as Gary read the instruments and tape and recorded the numbers.

In 1981 the water was a bit lower than in 1979, and we managed to get into the second room. About 7 meters high and 8 meters wide, the cave headed west for 20 meters before turning sharply to the south. Twelve meters onward was a second falls, 2 meters high, which halted our exploration. Due to a vicious undertow and smooth passage walls, the falls could not be approached any closer than 9 meters. The other highlight of this room, however, was a bizarre combination of speleothems and water-spouts. Descriptions are difficult, and efforts at photography were futile; the high humidity soaked our cameras with condensation.

Caving in Tolantongo was like working in a hot tub. The heat was quite draining, and the generally easygoing mañana atmosphere kept our work efforts at a very mellow pace. Yet during the course of our six-day stay at the cave, a fair amount of field work was accomplished.

El Túnel, a 2-meter-diameter by 33-meter-long cave just above and slightly east of Tolantongo, was surveyed. Eric measured water, wall, and air temperatures throughout the cave and tested for various gasses possibly present. Kirsten and Eric collected water samples, which I field-analysed for pH, dissolved oxygen, sulfides, and alkalinity; further analyses were done after our return to the U.S. Dottie interviewed many of the locals for history on the cave and for cave leads. One of the more interesting facts she picked up was that during the rainy season the Río Tolantongo changes from blue-white to dark brown, with occasional goats and small trees being washed out of the cave.

Those less learned in Spanish didn't do as well as Dottie. In particular, Eric came up to me one afternoon, after doing the gas analysis in the cave, and related that some Mexicans, obviously curious about his work, began talking to him. Eric told them that he didn't speak Spanish, but they babbled on all the same. Repeating himself, in case the cave river had drowned out his voice, only increased their en-

thusiasm. He tried a couple more times, to no avail, and the one-way conversation continued. I asked Eric exactly what he had told them and discovered he'd informed them that he didn't speak English.

Near by Features

Everyone did lots of searching for caves, springs, and other geologic features. In addition to hiking about the immediate vicinity of the cave, Gary, Eric, and I drove up into some nearby karst highlands, 10 kilometers north of Tolantongo. We checked some of the large sink-holes indicated on the topographic map, but found only one cave. It was a 25-meter-deep pit in the smallest of the mapped sinks, and it had a small stream flowing into it. It would be another year, however, before it would be explored.

The most fruitful of our searches was when Kirsten, Eric, and I sought out the sources of the many cascades tumbling down the canyon walls near the gruta. Our hike located all of the springs, none from caves, and took us above Tolantongo into a 100-meter-high gorge, a tropical fantasy of water, plants, and limestone. About 200 meters back, the gorge narrowed to about 2 meters and was blocked by a 10-meter-high wall of travertine. Halfway up the wall, a hole was blowing hot air. Being able to climb up into it, but no higher, we found that it dropped off almost immediately, and a roaring river could be heard below. Unfortunately, we didn't have time to check it out. We had friends to meet in the San Francisco area of San Luis Potosí, where we discovered a new pit, Sótano de Trueno, but that's another story.

Return 1982

Returning to Texas, I continued work on proving the origin of Tolantongo's heated water. References on the regional geology and hydrology were closely examined. I'd also obtained a better copy of the topo map, which showed that the large Arroyo de Chalmita ended in a 60-meter-high headwall less than a kilometer from the cave. This would explain the source of the goats and trees washed out of Tolantongo during floods. In December 1982, Eric and I returned to mop up a few loose ends, or so we thought.

In El Túnel, an unexplored side passage was surveyed. Its stream was the source of the 10-meter downspout in Tolantongo, directly below. Wayne Russell, of Austin, had generously loaned us his water-proof Nikonos camera to photograph the cave. High water, however, kept us from entering the second chamber again and from photographing the unique waterspouts. A surface survey tied in all the major springs to the cave and also extended up the gorge to the hole in the travertine wall. We decided not to push in through this hole, but rather to concentrate our efforts at the sinking of the Arroyo de Chalmita. This would wait a few more days, though, for we wanted to take a look at another cave, Grutas de Xoxafi.

Xoxafi

Located 30 kilometers south of Tolantongo, Xoxafi had been described in the literature, and by some cavers who probably read it there, as a paleospring maze or a "dry Tolantongo." Bull! The entrance is a ceiling collapse into a large room below. There is no evidence of it ever having been a spring. Rather simple in its layout, the cave shows both phreatic and vadose development, with strong influences from a rapidly lowering water table.

Hoping it could still be used as a model to compare Tolantongo with, Eric and I agreed to survey Xoxafi. From the entrance collapse, we moved west into a large room, past a skylight, to a down-sloping passage. This passage led us further into the dry and dusty cave, down a couple of wooden ladders to the large room at the bottom of the cave. After three days of detailed surveying, beginning at the bottom, our survey reached the entrance. There was still more to do, but we had lost our enthusiasm for this lifeless, uninspiring cave. Our poor mood was partly because we had expected something pertinent to our work in Tolantongo, and better things awaited us in the Arroyo de Chalmito.

Other Sótanos

Taking a day-long break before our assault on the arroyo, we drove around checking leads. Cerro de Cushmame was 15 kilometers west of Tolantongo, southeast of where the dirt road to the cave turns off the paved road. The topo map indicated

many sinking streams on the east flank of the mountain, and a 1950 report mentioned that one fed into a "cavern of unknown extent." Those most easily accessible and least hopeful, checked for the sake of thoroughness, were located off the mountain and in the alluvial valley. They turned out to be man-made dirt dams. More promising swallets were higher up on the mountain, but since this was a day of rest, we drove away to the highlands we had visited the year before.

Eric was anxious to drop into the pit we found in 1981, but sadly discovered that it ended in a moderate-sized lake room. The cave was named Sótano de los Pañales because someone had discarded a few dozen disposable diapers to be washed downward: out of sight, out of mind. The remaining unchecked sinks in the area were checked, but nothing was found. According to local villagers, the sótano is the only cave in the area.

The Canyon

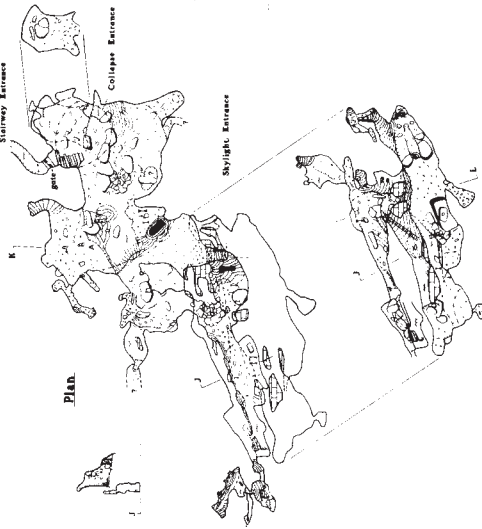
The next day, after closely examining the region with binoculars and studying the topo map, we decided on our route into the 450-meter-deep Arroyo de Chalmita. Our plan was to follow a side canyon into the arroyo, then hike downstream to where the water disappeared. With close to 80 meters relief between the entrance to Tolantongo and the prospective upper entrance, we thought it would be easier to bolt across a waterfall and rappel down, rather than bolt our way up and across. If we made the connection, we would survey it and then pack our way down through the cave on a pull-down trip, to emerge out of Grutas de Tolantongo. From there we could easily hitch a ride out of the canyon to our vehicle awaiting us on the plateau above.

Things seldom go as planned. Due to all the ropes, ladders, and metal hardware we carried, our packs weighed about 45 kilos each. This was manageable until the side canyon turned vertical. The least steep of all possible routes now confronted us with dozens of drops from 5 to 15 meters. All were free-climbable or bypassable with varying degrees of difficulty, but none could be done with frame packs holding more than 15 kilos of gear. We were forced to take turns lowering the packs by rope. Nuisances like trees and plunge pools

GRUTAS DE XOXAFI
Hidalgo, Mexico

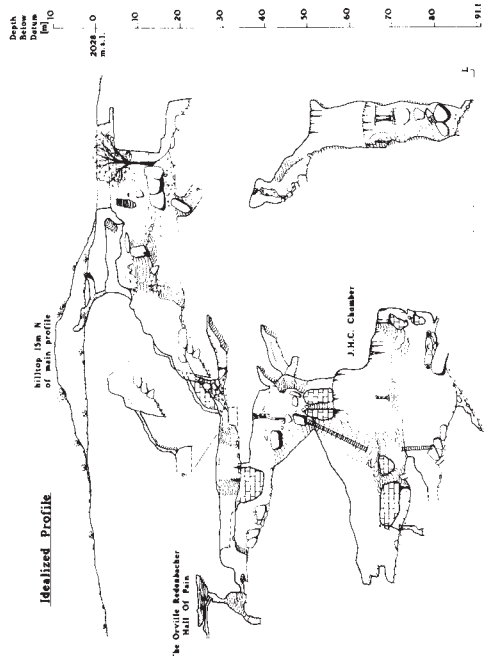
Suunto Compass & Inclinometer
30 m Fiberglass Tape

Survey: 13-15 Dec. 1982
Eric B. Short
George Veni; draft

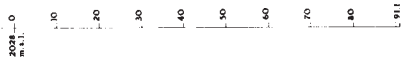


Length: 514 m
Vertical Extent: 97 m

Idealized Profile



Depth Below Surface (m) 10



served to aggravate this already tedious process and greatly slowed our progress. We'd hoped to be at our final destination within eight hours, but it took us twelve hours to simply get out of the side canyon into the arroyo. Nightfall was then only fifteen minutes away, and the 60-meter headwall an additional 3 kilometers. We stopped there and set camp in the dark.

Morning came and we reevaluated our situation. No way would we leave the arroyo the way we came. Our time-table had been set back at least a full day. The depletion of food and other supplies wasn't critical, but was definitely noticeable. One Wheat lamp was damaged beyond available field repairs. The only sure way out was a full day's hike up the arroyo to a road crossing. The cave offered a potential escape route, but it was also too much of an unknown factor. Deciding to play it safe, we would retreat up the arroyo.

Before packing out, though, we grabbed flashlights and camera and, without the heavy packs, literally ran downstream to the cave. As we neared the headwall, we noticed a sudden increase in the volume and temperature of the arroyo's perennial stream. The canyon walls were now covered with lush vegetation, and warm springs flowed downwards. Our excitement was building. At any moment we'd find the gaping cave entrance that we had traveled so long and hard to see. Exuberantly running through the stream, we suddenly turned a corner and found a Mexican family doing their laundry. The irony was ridiculously funny and very characteristic of what we should have expected in that wonderful country.

The 60-meter-high swallet was just up ahead. La Gloria, the Mexicans called it. Truer words have seldom been spoken. Where can one begin to describe it: water, waterfalls, springs, mist, rocks, vegetation, mineralized vegetation, heat, harsh sunlight, beckoning darkness--an incredibly beautiful bombardment upon all of the senses. Much to our surprise, the gorge above Tolantongo

did not end shortly past the travertine wall, but continued, to emerge at the arroyo's headwall as La Gloria. (Mexican provisional topo maps leave out contours when things get too crowded, leaving the details to one's imagination.)

Dimly lit in the shadows, about 100 meters away, was the far side of the travertine wall. Somewhere between that wall and the entrance into La Gloria, the newly born Río Tolantongo disappeared downward in the shadows. As our foul luck would have it, the only way to press on was a 2-meter dive into a deep pool. To come back upstream, out of La Gloria, we'd need at least 5 meters of our 300 meters of ropes and ladders, which we had left back at camp, to climb out of the pool.

"Frustrated" is pitifully inadequate to convey what we felt and still feel towards the situation. As we returned to camp, we looked at the Mexican's trail, out from La Gloria and presumably to Tolantongo, but decided it would be easier to hike along the broad, brush-free base of the arroyo. The gentle upslope gradient would be easy to walk and grant us ample opportunity to view the magnificent geology, as compensation for our efforts.

Eventually we got to the road crossing the arroyo and immediately caught a ride. Naturally our trek to that point wasn't as smooth as predicted. Three times we had to free-climb up vertical shale faces, reaching heights of nearly 30 meters. Climbing splintery shale is interesting. When confronted with a troublesome overhang or bulge, you simply reach out with one hand and tear it apart, contouring to your own personal needs. Of course, that doesn't speak favorably about the holds your fingers and toes are latched onto.

So Grutas de Tolantongo still awaits completion, and so does Grutas de Xoxafí. If all goes according to plans, we should be able to finish our work in at least one, if not both, of the caves during our next venture to Hidalgo. But then again...

Espeleología Térmica

Las Grutas de Tolantongo es una caverna con aguas termales (37°) y se localiza en un profundo cañon cerca del poblado de Ixmiquilpan, estado de Hidalgo. La cueva fue mapeada hasta el segundo salón, donde una cascada de 2 metros detuvo nuestro viaje. El Túnel es un cueva de 2 metros de diametro y 33 metros de largo la cual se dirige a la galería de Tolantongo. Grutas de Xoxafí está localizada a 30 kilometros al sur de Tolantongo fue también mapeada. Sin éxito se busco el sumidero de aguas del Tolantongo.

Upstream in

TOLALTONGO

Alejandro Villagomez

It was a slow morning. I woke up lazy-drunk. Slowly, I got out of my rented car and almost immediately my body began to tingle. A wiff from the morning breeze awakened my sleeping body. The odor was familiar-- the smell of a cave nearby, a river cave.

Grabbing my lamp, helmet, and rock climbing shoes, I scurried off in the direction of the smell. Soon my efforts were rewarded by an entrance measuring, perhaps, 10x20 meters with water flowing out. Gaining entrance from this side of the river looked difficult, but fortunately I found an old cable which made crossing the river easier. Before long I was in the entrance chamber.

This was a warm water cave and occasionally felt downright hot! As I made my way further upstream I found a second waterfall. Trying to climb this waterfall I suddenly slipped and fell. I was in trouble again. In the river's turbulent water I almost drowned.

After this experience with solo caving I decided to return to México City and get help. At the caving meeting I proposed a return trip but this time prepared for serious exploration and survey.

Returning in November with a larger party we began working our way upstream once more. This time we had ropes so that the first caver through could swim and belay from upstream. In this way, if any problems were encountered with the white water, the lead caver could pull the others up to safety.

Using this method we reached the second chamber named Donkey Blue. Things became interesting again as we

quickly encountered another waterfall. This obstacle coupled with the fast water that was running around the Donkey Blue chamber made for some challenging caving.

Ricardo Torres and Pablo Boobs climbed about 2 meters up a very slippery wall right out of the water. This got them to the top of the third waterfall. From this point we could see that the water was flowing out of a more or less round passage.

The next day we reached the Socky Cascade about 1.5 meters high by doing a tension traverse. I reached the opposite wall and moving to the left found a dihedral which David Castañeda climbed. From here David and I saw the next two challenges: Hot Legs Wall and the Turbine, which was shrouded by the mist from chamber three.

January 1983

In January 1983 I returned to the cave with Pablo Francisco and David Castañeda. The first order of business was to dive into the pool below the second waterfall in search of equipment lost during the November trip. Unfortunately we did not find anything.

After this excursion we rigged the cave again and I took the lead. Ten meters of free climbing led to the top of chamber three. Then some walking and a rope was rigged to a large stalactite. After a few more meters, another climb, and we were up the Hot Legs Wall.

From here we could see the turbine entrance. I started chimneying through this area and was glad that I was wearing rock climbing shoes. After several more meters of

passage were traversed (without belay) I returned, having seen the sixth waterfall. More equipment would be needed on the next trip.

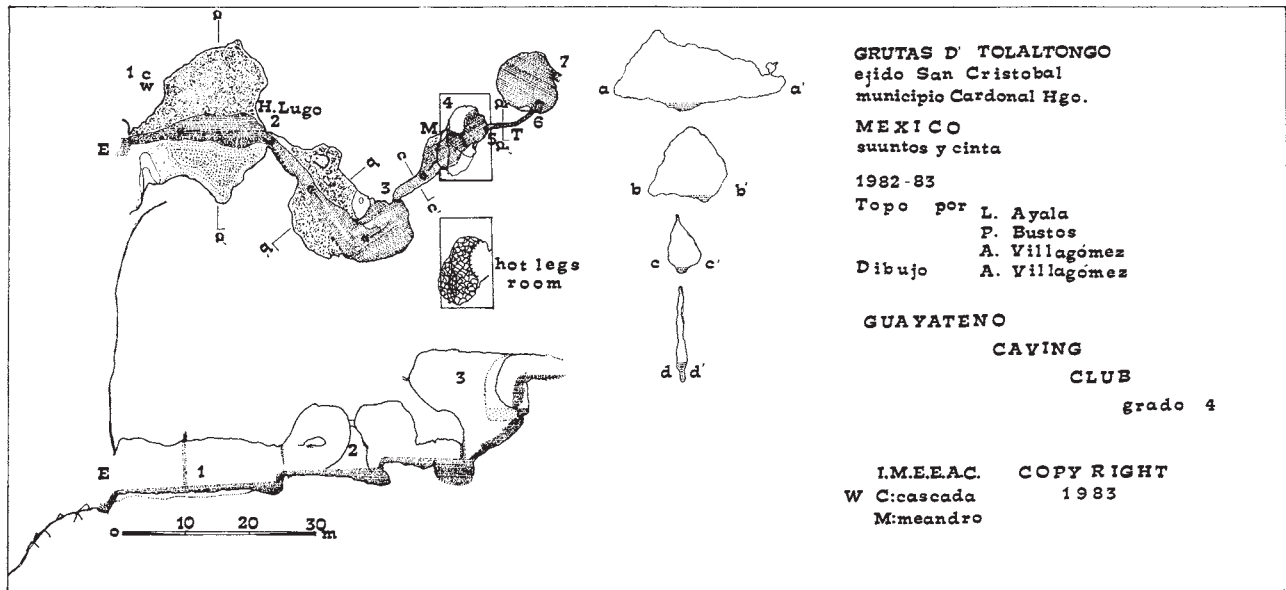
Easter 1983

On the Easter trip, J. Montiel, Gloria Montiel, Javier Montiel and Joseluis Vazquez joined us at the main campground. On the first trip Jorge Francisco, J. Montiel and I went in to resolve the Turbine problem. We put in a good 3/8" bolt and I again started fighting the wall.

For psychological reasons a 1/4" bolt was drilled and I continued to climb about 2.5 meters higher to the base of the sixth cascade. This involved a very difficult layback move. Pablo, Montiel and Joseluis followed.

Climbing around the fourth chamber yielded yet another waterfall--the seventh. We tried to build a wooden scaling pole out of trees but finally decided to return with a steel pole on the next trip.

A survey was completed as far as exploration has progressed. So far about 65 hours have been spent in the cave.



Tolantongo 82-83

Proyecto Tolantongo 1982-83: Espeleólogos del IMEEAC han estado explorando este río subterráneo de 37° C. La exploración hasta ahora ha sido dura pues se ha progresado sobre 6 cascadas explorando río arriba. Hasta ahora la exploración se mantiene limpia pues no se has empleado técnica de escalamiento artificial. La cueva es comercial y como todas en México tienen un dueño, de tal manera que se ha regeerido el permiso ha estos. Para su exploración personas o clubes interesadas en la exploración favor de contactarse con Francisco Dardon, c/o Alejandro Villagomez, calle 21 #13, Col. Prohogar, CP 02600, México DF, MEXICO.

Resumidero



Carlos Lazcano

del Pozo Blanco

Early in 1981 I began to review geologic maps of various regions of Mexico, with the idea of locating new areas of promising speleological potential. During this process I found a limestone plateau over 2000 meters in elevation in the states of Colima and Jalisco that appeared to be favorable for development of deep caves.

The following July I conducted a preliminary investigation of the area, called Cerro Grande. Access is difficult: 45 kilometers of dirt road, a five-hour trip. Three municipios cross the area, Comala and Minatitlán, Colima, and Toluca, Jalisco. It was immediately apparent that there existed a large number of vertical holes, which the locals called pozos or resumideros. In late September I returned to the area with Victor Granados and Hector Guzmán, but our trip was frustrated by a hurricane. In May 1982, Victor Granados, Eusebio Hernandez, and I succeeded in

exploring thirty caves on Cerro Grande, including the spectacular Resumidero del Pozo Blanco, a 241-meter-deep cave with a 233-meter vertical drop.

Pozo Blanco

The deepest cave we had found in the area was Resumidero del Aserradero, about 180 meters deep, when our guide, Sr. Ramón Jimenez, told us of several deep resumideros in the north part of the plateau in an area called El Pozo Blanco. We shifted our activities up to this area, camping in a village called El Terrero.

We left camp early on the morning of May 26. Sr. Jimenez guided us to the north for 4 kilometers, through a forest of oak trees. There were numerous holes in the ground along the way, but we continued on to the one our guide indicated was "profundísimo." The hole in question was situated in a large

dolina with an arroyo running into it. The entrance to the pit was 14 meters long and 3 meters wide. Looking down, we could see only blackness. We tossed in a rock. After a few seconds, the rock bounced several times, then we heard no more. "A drop of at least 70 meters," pronounced Victor.

We rigged an 80-meter line, and I began the descent. Unsure if this would reach, I carried with me another rope 40 meters long. Little by little I slid down into the darkness; below me the abyss yawned as if it were infinite. At 58 meters down I reached a tiny ledge. I began to think the rope might not reach, so I tied on the extra rope and continued down. I reached a second ledge, sloping but large enough for two people. I was now 83 meters down, with little rope left. Below me the pit continued down, 10 meters in diameter.

I threw another rock. One, two, three, four, five, six seconds, and a distant dry thud. Six seconds! I nearly jumped for joy. At least 100 meters more to go. From the ledge I shouted up to Victor to come down with the two ropes we had left. When Victor arrived, we rigged the two ropes, which together gave us another 100 meters. But we doubted it would reach.

I continued down the shaft, a cylinder with slick walls 10 meters apart. The rope hung free, a meter away from the wet wall. Below was only a deep blackness.

After some minutes of slow descent, I reached the end...of the rope! I was 180 meters down and the pit continued. Below my feet all I could see was a dark void. Elated, I began my climb out.

To the Bottom

The following day we returned with 500 meters of rope, in six pieces. At the entrance we rigged the longest line, 180 meters. Eusebio and I were to descend this time. As before, I entered first. At the second ledge (-83 m) we tied the rope off. I continued down with a 75-meter line and rigged it off a rock projection a little above the end of the 180-meter rope. I lowered myself down into the unknown, deeper into the mountain. Thirty meters below the last tie-off the shaft opened into a large chamber. My light would not reach the walls; all

I could see was darkness. The rope seemed to have no end, but at length I could see the bottom and the end of the rope. There was only half a meter of rope on the bottom, but I had arrived at the floor of the terminal chamber.

Eusebio came down immediately. This was indeed the end of the cave; the floor of the room was covered with semi-consolidated mud, with no possibility of a continuation. From certain positions you could see the entrance to the pit 233 meters above, like a single star in an infinite universe. During our time on the bottom, we conducted a survey; the room measured 30 meters long, 20 meters wide, and 40 meters high. The lowest point of the cave was 241 meters below the entrance.

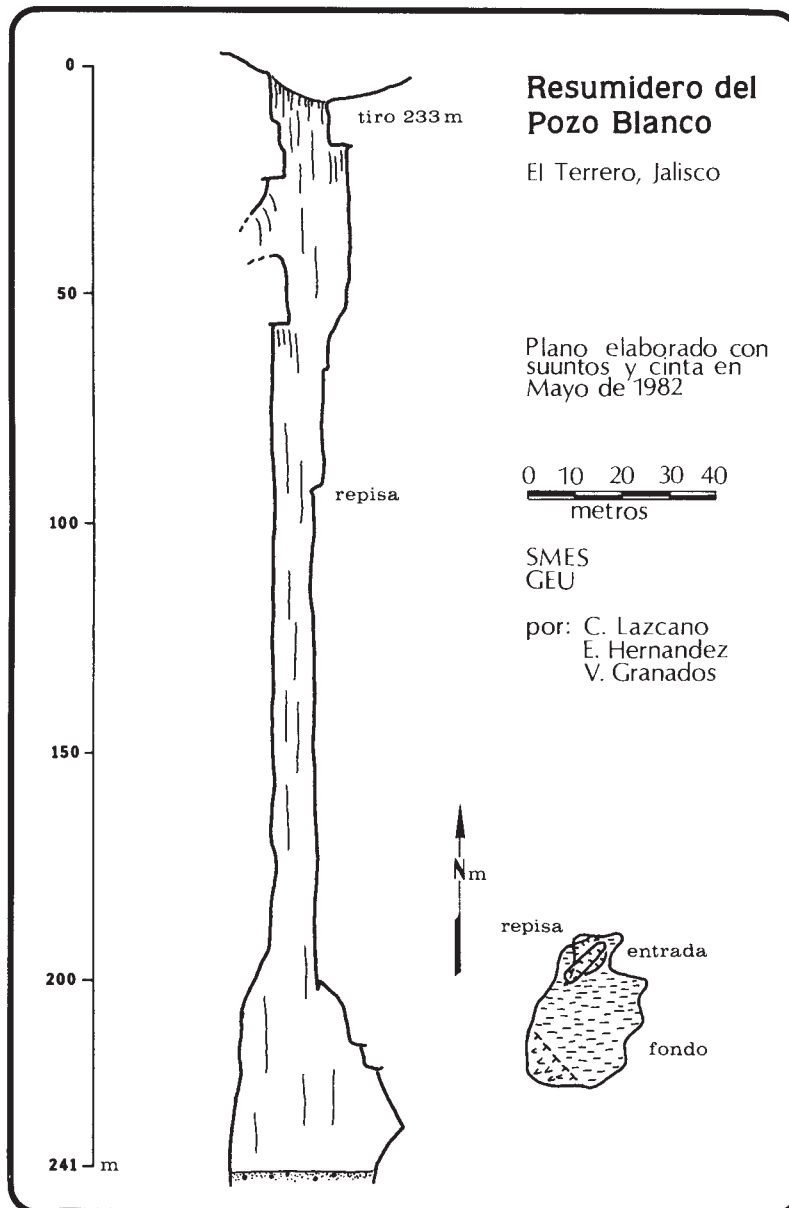
Other Caves

During the same expedition, we also explored a number of other pits, the deepest of which were:

- Cueva de los Cipreses--This cave starts out horizontal, then descends down a series of eight drops, the largest being 20 meters, and reaches a total depth of 120 meters.
- Resumidero de la Plaza de Toros-- A pit 62 meters deep.
- Resumidero de la Lagunita-- A 58-meter pit.
- Resumidero de los Ventiscos--A 51-meter pit.

At the end of December 1982 and in early January 1983, the third trip to Cerro Grande took place. On this expedition were Gonzalo Gomez, Victor Granados, José A. Paez, and José A. Saloma. The exploration of Resumidero del Asseraderito was completed. The total depth was 200 meters, and the longest drop was 60 meters. Also explored was Resumidero de la Escondida, with a vertical drop of approximately 120 meters, which continues. They also discovered Pozo del Tapeizte No. 1, an 82-meter drop, and Cueva del Pozo Blanco, a 35-meter drop. Twelve caves were explored in all.

Much remains to be discovered in the Cerro Grande region. There is a depth potential of 1500 meters, with annual rainfall of 1500 millimeters. During 1983, the Sociedad Mexicana de Exploraciones Subterráneas will be concentrating its activities in this area.



Resumidero del Pozo Blanco

En Julio de 1981 Carlos Lazcano condujo una exploración preliminar al area de Cerro Grande. El cual se encuentra a una altura de 2000 metros sobre una meseta coliza entre los estados de Colima y Jalisco. En Mayo de 1982 Carlos y otros espeleólogos regresaron al área, explorando 30 cuevas, de las cuales el Pozo Blanco fue el mas espectacular con un tiro vertical de 233 metros y una profundidad total de -241 metros. Posteriormente en diciembre de 1982 un tercer viaje fue efectuado a Cerro Grande. El Resumidero del Asseraderito fue mapeado hasta una profundidad de -200 metros, junto con otras cuevas. Durante 1983 la Sociedad Mexicana de Exploraciones Subterráneas concentrará sus actividades sobre dicha región. Sin embargo hay mucho más que por descubrir ya que el potencial es de 1500 metros junto con 1500 milímetros de lluvia anual.

BOOK REVIEW

Draco. José Montiel Castro, ed.
Manuel F. Soto no. 131, Col.
Constitucion de la Republica,
Codigo Postal 07460, México
D.F., México. Numero 1, May
1982. 34 pages, 5 maps, 11
diagrams. US\$5.00. Numero 2,
January 1983. 33 pages, 6 maps,
3 diagrams. US\$5.00.

Much of the existing literature on Mexican caves has been written by foreigners to that nation's soil. Organized caving in Mexico has never had a strong footing, and only in the last five years have Mexican caving groups risen above the "excursionista" level. It is therefore auspicious that *Draco*, a Mexican caving newsletter, has recently appeared.

Draco number 1 is essentially a one-man publication; the editor wrote seven of the eight featured articles and drafted all but one of the numerous diagrams and maps. Such enthusiasm often results in a somewhat narrow focus, but the editor has presented a wide range of technical knowledge and imagination. Articles include a history of Mexican speleology, trip reports and cave maps from the Zacatecolotla, Tlamacazapa, and Acuitlapan areas of Guerrero, cave mapping, vertical techniques, and histoplasmosis.

Of particular interest to Mexican aficionados is Montiel's essay on the stages of speleology in Mexico, which outlines the speleological milestones that Mexican nationals have accomplished. Many of us are familiar with only North American or European activities in Latin America, and it is educational to reflect on the many important con-

tributions that have been made by Mexican cavers. Such notables as Dr. Candido Bolivar y Pieltain and Dr. Federico Bonet were pioneers in Mexican cave studies and were instrumental in sparking the enthusiasm of later explorers.

Draco number 2 is similar in content to number 1. Articles include the birth of speleology in Europe with an overview of the dangers involved in caving, the first installment on what is to be a series of articles on first aid, a preliminary report on the cave biology of Grutas de Juxtlahuaca, Guerrero, material on vertical techniques, a request for information concerning cave accidents that have occurred in Mexico, and a report on the mapping of several caves in the Zacatecolotla area, Guerrero.

The Zacatecolotla article deals specifically with the Resumidero La Joya, Cueva Gavilan #1, and Cueva Alas de Mariposa. La Joya is a fairly long stream cave that is well known to the Mexican cavers and weekend adventurers. Unfortunately, the map of La Joya has been cut up into six sections and presented on four pages with instructions on piecing it back together, and the middle part of the cave is not shown. It's rather confusing; I can only guess that the author plans to supply the missing link in a future issue. The article concludes with a hand-colored map of the region south of Mexico City that indicates limestone outcrops.

Draco is a bit expensive for its length, no doubt related to the high cost of reproduction in Mexico. Hopefully, as more Mexican nationals become skilled in the techniques necessary to explore the spectacular Mexican karst, we will see their efforts reflected in more publications such as *Draco*.

TAKE NOTHING BUT PICTURES

LEAVE NOTHING BUT FOOTPRINTS

LETTER

In late February 1983, a group of French cavers exploring in the Zongolica area of Veracruz committed one of the lowest acts of piracy that has occurred in Mexico. The French, knowing that Mexican cavers had explored down 200 meters in Ahuihuitzcapa and it continued, decided to explore it themselves, with no consideration for the Mexicans.

This act of piracy by the French has caused great indignation among the Mexican cavers. Each time the French have come to Mexico, they have been received with friendship by the Mexicans, and information regarding explorations has been freely shared. It is well known that in Europe speleopiracy is common, even among

some famous speleologists. Due to this lack of ethics and respect, much is kept in secrecy.

Fortunately, in America respect and friendship predominate between cavers, and up to now secrecy has not been needed. Between the U.S., Canadian, and Mexican cavers, who together have done the most work in Mexico, there has never been an act of piracy. There is an unwritten code of respect for the work of others.

Personally, I have come to develop a great admiration for French speleology. The writings of legendary figures such as Norbert Casteret, Robert de Joly, and others have inspired in me fascination and love for caves. It is sad that along with the great speleologists, there is also trash.

Carlos Lazcano Sahagún

