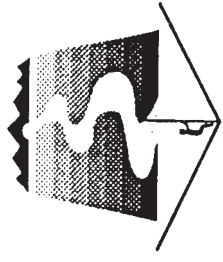


Proyecto Pápalo Expedition Report 1986 - 1989



by Carol Vesely and Bill Farr

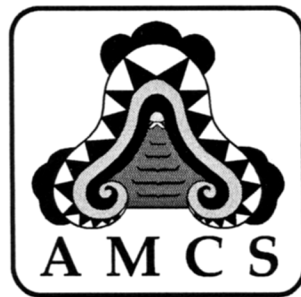


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Proyecto Pápalo Expedition Report 1986–1989

By Carol Vesely and Bill Farr

The Association for Mexican Cave Studies thanks the authors for permission to reprint this report on the initial exploration of this deep cave system in Oaxaca. The cave and project have both subsequently come to be called Cheve, and Sistema Cheve is now 1385 meters deep, second deepest in Mexico. It was the deepest in Mexico for a few years in the early 1990s, before Sistema Huautla regained that distinction. Additional explorations in the system and area are described in *Proyecto Cheve 1986–1993*, published by the project in 1994.



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Front cover: Bill Steele rappels down 80-meter Saknussem's
Well at -600 meters in Sistema Cuicateca. Bill Stone photo.

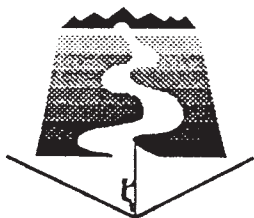
Proyecto Pápalo

Expedition Report

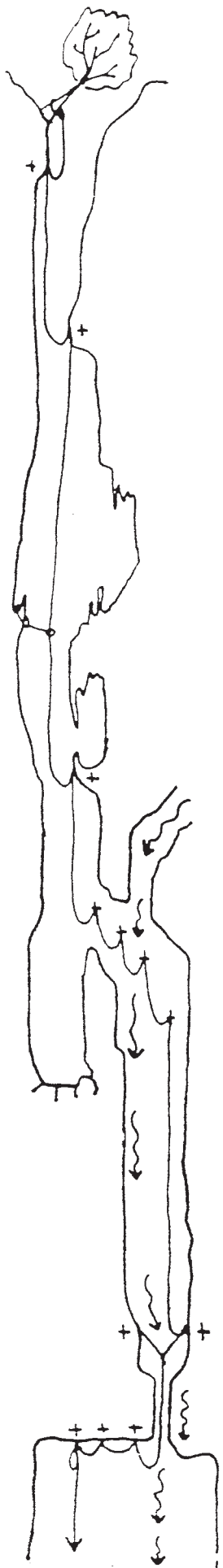
1986 - 1989

The exploration of Sistema Cuicateca-
second deepest cave in the Western Hemisphere

by Carol Vesely and Bill Farr



In December 1986, Bill Farr and Carol Vesely discovered the entrance to Cueva Cheve, located in the Pápalo area of the Sierra Juárez, Oaxaca, Mexico. In the two and a half years since this discovery there have been five trips to the area. Cueva Cheve has been connected to Cueva Moscas and Osto de Puente Natural establishing Sistema Cuicateca, which is currently 16.3 kilometers long and 1243 meters deep, the second deepest cave in Mexico and the eighth deepest in the world. This report describes the exploration to date in this promising system with potential to be the deepest cave in the world.



Proyecto Pápalo

The Area

The Pápalo area is located in the Sierra Juárez in the state of Oaxaca, Mexico just south of and across the Río Santo Domingo from the famous Huautla area. The area is characterized by its high elevation and relatively uninhabited pine forest. The narrow band of karst is bounded on the east, west, and south sides by metamorphic rocks that concentrate the surface runoff into streams that sink when they hit the limestone. To the south, the karst rises to a maximum height of 3200 meters and then gradually descends to the north for 19 kilometers to reach the Santo Domingo at 300 meters elevation. The nearest large town is Concepción Pápalo, approximately 10 kilometers away.

Discovery Trip: In Search of the World's Deepest Cave

Although for many years cavers have been curious about what might lay across the river from Huautla, the Pápalo area remained unchecked until December 1986, when Bill Farr and Carol Vesely, acting on a topo map lead given to them by Peter Sprouse, ventured into the Sierra Juárez in search of new caves.

The initial target was a large sink that appeared on the map to be two kilometers long by one kilometer wide. After seeing no signs of karst on the long drive up the mountain, Bill and Carol finally located the sink-hole and descended to the bottom via an abandoned logging road, blocked in several places by fallen trees. They hardly paused for breakfast before running down the drainage axis of the sink in search of entrances. After passing several cold-air "bug-holes," a couple of which took small streams, the first find worth noting occurred where the drainage axis turns from west to north. Here, an arroyo five meters wide by seven meters deep, drops into a tall, fissure entrance one-and-a-half meters wide by six meters high. Christening the cave Grieta de los Bichos for the cloud of gnats that occupied the first ten meters, Bill checked it out briefly, finding that it consisted of a couple of parallel fissure passages dropping rapidly down a series of short climbs.

As they were not yet to the bottom of the main sinkhole, they decided to leave this discovery temporarily, and proceed in search of larger caves. A couple of hundred meters farther was a seeping resurgence area giving birth to a small stream that flowed along the floor of the sink. They began to run through the pine forest alongside the stream, eager to see where it went. Then, just as Carol proclaimed, "Wouldn't it be great to find a really grand Mexican-style entrance," there it was. The stream dropped down a seven-meter waterfall to flow lazily across a beautiful, grassy-green llano (field), whereupon it was swallowed by a gaping black hole at the base of a limestone cliff, 80 meters high.

The main entrance to Cueva Cheve is 30 meters wide and six meters high and leads to the top of a large, 30-degree-sloping, breakdown room 70 meters wide by 200 meters long by 30 meters high. It is located at an elevation of 2700 meters. A second, tall, narrow entrance lies to the east of, and slightly higher than, the main entrance. The stream sinks into breakdown just inside the main entrance and reappears in a waterfall at the bottom of the room. From the Entrance Chamber three large passages are visible, two along the east wall and one at the base of the room. Picking a way down the breakdown to the base of the falls, Bill and Carol followed the stream into a seven-meter-wide by 18-meter-high canyon, which continued into darkness, sucking a stiff breeze. Their single flashlight seemed inadequate for exploration beyond this point.

First Survey

The next morning they began with a perimeter survey of the Entrance Chamber. Then, they followed the canyon passage downstream for 80 meters to a second large room, the Basket Room, named for the pieces of woven basket and mat found amongst the rocks. Nearby, the stream sank again. Although it was possible to follow the water by crawling through the breakdown blocks, they chose to follow the air instead. Scrambling down between car-sized boulders brought them to a continuation of the canyon and the first drop of the cave. A rappel

of seven meters led to more canyon passage. By now, they were beginning to notice one of Cheve's primary characteristics: at 47 ° F (8 ° C) it is cold.

Continuing the survey of Cool Canyon, the two encountered a second breakdown area, which required some digging through rotten rock to get through. Beyond, was an unattractive drop of eight meters, followed shortly by another drop of six meters with a small stream trickle going over it. They ended the survey at this drop.

The next day, they continued down the third drop, landing in an ankle-deep pool that trickled into a sump along the side of Cool Canyon. Past the Deceptively Deep Pool, they soon arrived at the next vertical section of cave, the Double Dip. Here, Cool Canyon dropped eight meters to a deep plunge pool, followed immediately by a second drop, of two meters, into another pool, followed immediately by yet another drop, into darkness. As they were accustomed to much warmer caves in Mexico, they had not yet learned to dress warmly enough for surveying in the windy, 8° C passages of Cheve. While debating the best rigging of Double Dip, through the icy cold water or along a high traverse, followed by a drop straight down after the second pool, the cold overcame them, and they headed out instead.

By the time they reached the Entrance Chamber, they were warm again and so decided to survey one of the other two side passages off the room. Choosing the highest one, thinking that it might connect to the upper entrance, the two cavers began surveying with consecutive 30-meter shots in ten-meter-diameter borehole sucking a gale of icy wind. Alpine caving in the tropics – who would have expected this in Mexico!

By the end of this three-day trip, the surveyed length of Cueva Cheve stood at 0.9 kilometers, with a depth of 100 meters. The cave was basically heading north into the heart of the mountain and towards the Río Santo Domingo, 17 kilometers away.

March 1987 - It Goes!

Bill and Carol returned to the Pápalo area two and a half months later. The goals for the March trip were to see if Cueva Cheve was going to keep going, and to further assess the cave potential of the area. In addition to work in Cueva Cheve, they began extensive surface work, locating and tagging numerous entrances for future exploration. From the beginning, it was obvious that the Pápalo area was worthy of a serious project orientation.



Descending the rapids just before the Stop Drop.

Resuming explorations downstream in Cheve, they descended the Double Dip Drop via the plunge pools. At the base of this drop Cool Canyon continued horizontally for 50 meters to the sloping, Fissure Drop of 15 meters. Past two more short drops of seven meters and three meters, was a T-junction, where Cool Canyon rejoined the main stream passage. Upstream quickly hit Triple-Whammy Falls, a 12-meter-high triple cascade. The downstream lead went over a series of beautiful rapids and falls to a waterfall drop, the Stop Drop, where they

turned around for lack of equipment. On the same trip they also finished surveying the large trunk passage that led from the Entrance Chamber to the upper-level entrance, named the Frozen Chicken Loop for the cold wind and chicken bones it contained.

Surprise Stream

Finally surveying the middle Entrance Chamber lead, they were in for a real surprise. It contained a parallel stream system! Downstream, Bill and Carol stopped at a six-meter drop due to lack of rope, while upstream they surveyed about a hundred meters, ending exploration at eight-meter-high Bold Falls. A side passage of Surprise Stream led to a dry, crumbly, mazy area, El Llucó, where they surveyed a couple hundred meters before becoming too disgusted with the loose crud falling off the walls.

After this four-day trip, Cueva Cheve had been surveyed to 1.5 kilometers long and 200 meters deep, with going leads, and strong airflow and water. In addition, six new cave entrances several taking water and air, had been located and tagged. They decided to re-

turn with more people next caving season to continue exploration.

In seven days spent in this remote area they had yet to see a single local person. However, on the way home they stopped in the nearest large town, Concepción Pápalo, to obtain permission from the presidente for a return trip. The local people were very friendly, and despite language difficulties permission was easily secured. The townsfolk claimed that the cave had no local name, but that the beautiful llano at the entrance is called Llano Cheve (pronounced with a hard 'ch' as in 'cherry' and ending in a long 'a' sound as in 'way'). Cheve is an Indian name, but none of the locals seem to agree on its meaning, or if it even has one.

Christmas 1987: Elephant-sized passages

In December 1987, Bill Farr and Carol Vesely returned to Cheve accompanied by Peter Sprouse, Susie Lasko, Nancy Pistole, Matt Oliphant, and Don Coons. While caravanning through Texas, the group encountered a herd of elephants in the middle of nowhere-ville in a supermarket parking lot. They took the event to mean that they were destined to find elephant-sized cave, and hence, elephants became the unofficial symbol of the expedition.

After a day of acclimatization and setting up camp in the llano, everyone was ready to resume exploration and surveying.

Peter, Don, and Bill headed downstream past the eight-meter Stop Drop, encountering more fun stream passage. After bypassing the next waterfall with a rope traverse followed by a down-climb, the team encountered an even more impressive waterfall, the Storm Shaft. At the bottom, as they were whipped by wind and spray, they were presented with two choices: either continue following the stream down more cascades, or take a dry side lead that Peter located. Choosing the dry alternative, they rappelled down a 20-meter shaft into a canyon,

four meters wide by ten meters high, that appeared to roughly parallel the streamway they had been in. Continuing down a series of two short nuisance drops, the trio came to the finest pit yet in the cave, the Elephant Shaft. This beautiful, clean-walled shaft dropped 45 meters to a continuing canyon. They could see down another drop to where the passage rejoined the main stream after this pleasant bypass. They ended the survey at the top of the next drop, having passed 300 meters in depth.

Meanwhile, Carol, Matt, and Nancy descended the six-meter drop in Surprise Stream, and followed the water for about 20 meters to a down-climb to a sump. Retreating from this area, the team headed to the Black Elephant Room, which Carol had discovered at the end of the last trip. A perimeter survey of the room located several infeeding passages, a couple with active streams. The main stream, which had sunk in the Basket Room, also reappeared in the Black Elephant Room, where it plunged down a short drop between large boulders.

The next day was spent ridgewalking to the north. Most notable was the discovery of Osto de Puente Natural (Natural Bridge Pit), an entrance three meters high and wide that led to a room with a deep pit, where rocks rumbled down for ten seconds.

The Christmas Present

The next day, Christmas Eve, Carol, Don, Nancy, and Matt headed into Cheve to continue exploring from the bottom of the Elephant Shaft, while Peter, Susie, and Bill headed downstream from the Black Elephant Room. On their way to the Elephant Shaft, Carol's team decided to check a previously unexplored lead at the top of the Fissure Drop. Don led across a short, exposed, traverse into a huge chamber and a steeply descending borehole they dubbed the Christmas Present. Clambering down over car- and house-sized breakdown blocks, they came to three short rope drops of seven, eight and eleven meters, and finally rejoined known passage at the base of the dry bypass drop from the Storm Shaft. This new route totally bypassed the wet

streamway. It was now possible to descend to the farthest limit of exploration without getting wet above the ankles: a great Christmas Present, indeed.

Starting the survey at the base of the Elephant Shaft, the cavers descended the 15-meter Junction Shaft, where they rejoined the main stream, as expected. Another four-meter drop and a short stream passage brought them to the top of 30-meter Angel's Falls. After rappelling along-

side the beautiful falls, where the water is close enough to touch, they landed next to a deep pool. A large in-feeder comes in from the east at the base of this drop. They followed the stream down the main passage as it got bigger and bigger. Soon they found themselves reeling out 30-meter survey shots as they descended a large borehole passage 15 meters wide and 20 meters high, the Giant's Staircase. The stream disappeared in breakdown after about 100 meters, and they

followed the dry borehole up over the Camel's Hump and down the other side. Again dropping at a 30° slope, they rapidly picked up depth as they climbed down over huge boulders. After 500 meters of borehole, the ceiling lowered, and the passage made a 120° bend. The passage opened up again at the top

of a large drop. Rappelling 50 meters, the cavers landed on a flowstone bridge, from which the stream could be heard below. They dubbed this impressive shaft Saknussemm's Well, and estimated it to be at least another 50 meters to the bottom. The cave had now passed 500 meters in depth. Their total survey for the day was 660 meters.

Back in the Black Elephant Room, Peter, Susie, and Bill descended a ten-meter drop

through boulders to follow the stream in a 15-meter-wide, ten-meter-high passage. After surveying 350 meters down the Río Cuicateca, they came to Terminator Falls, which they presumed would connect to the top of Triple Whammy Falls. Instead of descending, the trio surveyed a well-decorated ledge, Santa's Shelf. Here, Peter found a small hole blowing air, and proceeded to hammer it open. This led to the discovery of Elf Land, a small upstream in-feeder.



Nancy Pistole descends the drop in Surprise Stream

The descent of Mondo Pit in Osto de Puente Natural was the objective of the next trip. Finding the 90-meter rope to be inadequate to reach the bottom, and the lower part of the drop to be much wetter than anticipated, the group temporarily abandoned the descent. Instead, they sur-

veyed the entrance room and a short upper level directly above the pit.

Returning to Cheve the next day, Carol, Don, and Nancy surveyed their previous find, the Christmas Present. Next, the team ascended the dry drop to the base of the Storm Shaft. From here, they followed the water downstream, surveying down a few short climbs to a sump and up a steeply ascending tube to an overlook of the Junction Shaft. Then they ascended the wet route, derigging the drops and taking photos on the way.

Saknussemm's Well

Meanwhile Peter, Susie, Matt, and Bill descended to the flowstone bridge in the middle of Saknussemm's Well. Rigging the drop with a 90-meter rope, Bill descended, only to find that the rope had been blown under the waterfall, and had become hopelessly tangled around numerous knobs and pendants. After an hour of untangling rope and then rigging a series of rebelays to keep the descent out of the water, Bill was surprised to see Matt rappelling down towards him. The noise of the water had drowned out all communication with those at the top of the pit.

Eventually, the rope just reached a ledge from which it was possible to free-climb down an additional five meters to the bottom of Saknussemm's Well. Here, the cave went horizontally, picking up water from an infeeder that doubled the flow of the main stream just before a sump that could be bypassed with a tight chimney and high canyon.

The way ahead required swimming. As everyone was cold enough already, the team ended the survey at the infeeder, and headed for the surface. Here, they were greeted not by a rising sun, but by clouds and a cold, bone-chilling drizzle. For the next three days it drizzled, hovering just above freezing. Everyone sat around camp watching the water flow into the cave triple, as dry gullies turned into streams. The group did manage one trip into Elf Land, where 150 meters was mapped in Santa's Workshop, a well-decorated room

with a tight infeeder that still goes.

With the first day of sun all anyone wanted to do was dry out, and besides the water levels in the cave were still high – not optimal conditions to push the bottom of Saknussemm's Well. By the next day, everyone except Don and Nancy had colds, putting a damper on enthusiasm. As time was running out again, Don, Nancy, and Bill headed in to push the streamway. Peter and Susie had to head home, leaving Matt and Carol to commiserate on the surface.

Donning wetsuits at the bottom of Saknussemm's Well, the three cavers began the chilly survey of the Salmon Ladder. The Salmon Ladder consists of a series of progressively larger cascades, which eventually require a rope. At the end of the Salmon Ladder the cave descends steeply, as the stream enters the Turbines, where air and water tend to become one. Here, the survey team stopped. Don rigged the next drop and rappelled down to check it out. Radical, but feasible was the report. At one point the force of the water was so strong that Don had trouble clipping onto the rope to ascend.

In an effort to increase the depth of the cave, Don, Carol, Matt, and Nancy searched the karst above the Frozen Chicken Loop. Their efforts were rewarded with the discovery of two higher entrances, both of which connected into the main cave near the Frozen Chicken Entrance, adding 60 meters to the depth.

Mondo Pit

With only two days remaining and three people suffering from colds, exploration of Cheve was finished for this trip. At over 4.5 kilometers in length and 720 meters in depth the cave was still going, and starting to get serious. There was one goal left: the descent of Mondo Pit in Osto de Puente Natural.

The remaining five cavers descended upon Puente armed with a 120-meter rope for Mondo Pit and enough ropes for five additional

drops. Bottoming the pit at -100 meters, the group continued down a series of narrow canyons interspersed with short drops of seven to 20 meters. After several hours, Carol and Bill felt quite weak due to their colds, and left early, leaving Don, Nancy, and Matt to continue. They finally ran out of rope after 426 meters of survey. On the way out, Nancy's knee gave way in the middle of a tricky climbing maneuver, causing her to fall backwards three meters into a plunge pool. Despite the pain, she made it out of the cave under her own power, although it was three weeks before she stopped limping.

The next day everyone cleaned up the llano and packed out. Dropping Don off at the road to Huautla, the rest headed back home, already planning a more extended March return.

SPRING 1988: Breaking -1000 meters

Word about Cheve spread quickly and there was no shortage of people who wanted to help explore the cave. Bill and Carol planned a three-week expedition from the second week in March until the start of April. The main goal of the expedition was to try to push the cave to over one kilometer deep.

Arriving at the llano at the scheduled time, Bill Steele and Mark Minton of Texas, Jeb Blakley, Bob Benedict, and Steve Zeman of Idaho, and Bill Farr, Carol Vesely, Peter Bosted and Gary Mele of California found that Don Coons, Jim Smith, Ed Holladay, Mason Estes, and Lee Perry had arrived from Huautla a few days earlier loaded with ropes and gear. They had done a push trip at the bottom, breaking through the Turbines into gently descending stream passage.

A few days later Karlin and Beth Meyers, and Ernie Garza arrived, having completed their reconnaissance to the nearby Cerro Rabón. Llano Cheve was quite a contrast from the December trip. Then, the green, tree-lined field had a peaceful, pastoral ambience. Now,

with 17 people and gear everywhere, the place was ablaze with noise and activity.

East Gorge

Cheve continued almost horizontally for the next several trips. Water levels were noticeably lower than on the December trip. The main stream was followed, various infeeders were noted, and several sumps were found and bypassed. Finally, a trip by Bill Farr, Mark, Jim, and Bill Steele encountered a distinctive 23-meter free drop into the East Gorge, a borehole in the same black-and-white-banded rock that is characteristic of Huautla. This was followed immediately by a 15-meter drop next to an impressive waterfall. Jim descended this drop and continued following the water down the East Gorge for almost 800 meters.

Returning the next trip with Bob, Jeb, Ed, and Steve, Jim surveyed his scoop, and they continued onwards in the East Gorge. After going horizontally for almost a kilometer, again the cave descended steeply in a short rope series leading down to a large sump at -958 meters.

Camp 1

Part way through the expedition, Bill Stone and Matt Oliphant joined the crew. As trips were becoming over 24 hours long, the three Bills and Matt decided to try an underground camp in the Giant's Staircase at -400 meters. They soon decided that the camp was too near the surface to make much difference, and the three Bills headed out after four days. Matt, who had never camped underground before, stayed for a total of ten days, the full extent of his time in Mexico.

After a photograph and derig trip to the -958 sump, the three Bills and Matt attempted to find a bypass to the sump. Locating a place to climb up out of the East Gorge, they encountered an upper-level borehole, 15 by 15 meters. But progress in the downstream direction was blocked by a pit back into the East Gorge. So they surveyed upstream instead,



Mark Minton rigging the 18 meter drop in Cueva Inclinada.

netting several hundred meters of easy passage until they reached another pit.

Northwest Passage

On the next trip, Ed and Jim located another climb-up farther downstream that went to a continuation at the same level as the previous borehole. The two-person team surveyed an incredible 800 meters in the spacious and occasionally well-decorated Northwest Passage at over 900 meters depth, and had one loop of several hundred meters that closed to within one meter! They ended their survey at a bolt climb.

The bolt climb at the end of the Northwest Passage seemed certain to bypass the -958 sump. For the final deep push trip of the expedition, Ed and Bill Stone headed into the cave early to get Matt so they could start the bolt climb. Matt led an easy traverse that actually bypassed the anticipated bolt climb. On the other side, the passage broke into large borehole, 15 meters in diameter and filled with extremely fresh breakdown. The three cavers scooped ahead for about a half hour, then returned to the traverse to wait for the others. After an hour of waiting, Bob, Jeb, Jim, and Steve finally arrived. They had been taking

pictures on the way. The whole group explored through the large borehole. Rappelling a 15-meter drop, they found that the passage continued to another drop, where they could hear water flowing at the bottom. At this point the group broke into two teams. One team headed out, surveying what had just been explored. The others proceeded down the Widowmaker Drop, where Jim set two bolts to redirect the rope away from a large loose rock. They found the stream again; it had now doubled in flow to about two-thirds cubic meters per second. The sump had been bypassed. They followed the water down some small cascades and through two boulder chokes. Exploration finally stopped at a third boulder choke at -1038 meters. The group surveyed out and derigged the cave to the top of Saknussemm's Well. In total, the two groups surveyed over a kilometer in a trip that lasted 33 hours.

Cueva Moscas

One of the more obscure entrances discovered on the March 1987 trip was that of Cueva Moscas (Fly Cave), located in a small brush-filled sinkhole. The descending muddy crawlway just inside the Moscas entrance had strong airflow, making this miserable-looking hole worth pushing. After ten meters, the cave opened into walking passage, which split into two descending leads. The right-hand passage began as a meandering canyon that went a few hundred meters and down two short pits before becoming too tight. The left lead went to a pit with good airflow. This led to a room followed by a series of five more pits separated by short stretches of horizontal passage and rooms. The wind blew strongly through the small fissure passages in particular. Moscas was pushed primarily by Carol, Peter, Mark, and Gary with help from Ernie, Bob, and Steve. After four trips and a surveyed length of 790 meters, Moscas connected as an infedder to the Black Elephant Room in Cheve, adding 70 meters to the depth of the cave and creating Sistema Cuicateca (named after the Cuicateca Indians of the area).

Llano Español

Another objective of the expedition was to begin investigating some of the areas farther from Cheve in the hopes of locating more entrances. After Bill Steele, Mark, and Bill Farr discovered several entrances in nearby Llano Español to the south, Peter, Carol, Gary, and Mark camped there and surveyed the caves. They began with Cueva Inclinada (Inclined Cave), located next to a streambed and issuing a strong breeze. The entrance was in a rock-pile, but soon the cave opened into a sloping walking passage, which followed the area's 30 degree dip. The canyon passage became progressively larger and eventually led to an 18-meter pit. At the bottom, the passage continued descending, with cobble and sand fill lining the walls. In some places this fill formed significant sections of ceiling more than eight meters overhead. Eventually, the cave ended where the stream channel became completely filled with sediment in a large terminal chamber. The air seemed to disappear into a dome, ten meters overhead. Cueva Inclinada is 365 meters long and 114.5 meters deep.

The next day the group spent several hours in vain trying to find a way through blowing breakdown in a promising area on the other side of Llano Español. Frustrated, they headed for the last known entrance in the area, Cueva Tutilomo, named for the beautiful orange flowers growing near the arroyo entrance. Tutilomo is formed along a steeply dipping fault. The cave had good airflow but one rope drop and numerous climb-downs eventually brought Mark, Peter, and Carol to the bottom after only 140 meters.

Puente Natural

Throughout the expedition four trips were made to Osto de Puente Natural. On March 16, Don, Steve, Jeb, and Bob pushed down a series of tight, awkward canyons and short drops to the base of the narrow, drizzly, 90-meter Fissure Drop. The next day Ed and Karlin hauled in massive amounts of rope and surveyed down the second of two Flowstone

Drops, each about 30 meters deep, and into the descending canyon passage beyond. Unfortunately, some confusion about the end-of-survey station resulted in a hanging survey. The following day, Carol, Peter, and Gary surveyed the first Flowstone Drop, thereby tying in the hanging survey. They continued their survey down a dry 13-meter pit that bypassed a wet drop. After a five-meter pit and some small crawlways they called it quits. Their survey left the cave length just 40 meters shy of a kilometer long. A final push and derrick trip by Mark and Bill Farr nudged Puente to just over a kilometer long and 442 meters deep. A surface survey placed the cave directly over known parts of Cheve, making it very likely to connect.

Continuing surface work netted over 30 tagged entrances. A couple of other small caves were mapped, but much work remained in the karst to the north of Llano Cheve. At the end of the March 1988 expedition Sistema Cuicateca was 1038 meters deep and 9.2 kilometers long.

Spring 1989: Deep Camps and a Connection

The six-week Proyecto Pápalo '89 expedition had three goals: 1) to push deeper in Sistema Cuicateca by establishing a series of underground camps, 2) to connect Osto de Puente Natural to the main system, and 3) to conduct a dye trace to determine which spring is the resurgence for the water in Cheve.

In mid-February of 1989 Bill Farr, Carol Vesely and Don Coons arrived in Oaxaca ahead of the rest of the team to begin making preparations. The presidente of Concepción Pápalo initially denied the group permission to remain in the area without approval from a "higher authority." Although the local people have always been friendly, recently the presidente had been getting heat from his constituents, who mistakenly thought that the cavers were taking gold from the cave. After three days in Oaxaca City, Don and Carol managed

to obtain permission from the Head of the Bureau of Mines, who spoke good English, provided a letter of permission and even sent one of his assistants back to Concepción Pápalo to talk directly with the presidente. Thus, everything was all settled by the time the main group began to arrive at the end of February. Trip participants were Bill and Pat Stone, Pam and Jim Smith, Louise Hose, Todd Warren, Peter Quick, Bob Benedict, Jeb Blakely, Bitsy Ray, Steve Knutson, Peter Bosted, Mark Minton, Matt Oliphant, Nancy Pistole, Ron Simmons, John Schweyen, Andy Grubbs, Tim Jones and Rolf Adams (Australia).

To further establish good relations with the locals a date was arranged for a slide show about the cave to be given at the town square one evening. Bill Stone did such a good job of narrating the show that the townfolk insisted on a repeat performance. In addition, about 50 copies of a description of the project, written in Spanish, were distributed to people attending.

Sistema Cuicateca

Finally, with the P.R. work done, it was time to begin exploration. In order to push the deepest part of the system, it was necessary to set underground camps as trips from the surface were just too long. To reach Camp II it is necessary to traverse 3.7 kilometers of cave and descend to -830 meters in 33 rope drops.

After Don, Jim, Rolf and Bill Farr rigged the drops down through the Turbines, the first camp crew of Peter Bosted, Don, Bill Farr, Steve, Peter Quick, Jim, and Carol packed their duffles and headed in with Bill Stone lending support by carrying a load of group gear to the base of the Fuel Injector. Fortunately, we didn't have to actually go through the Fuel Injector (the wettest, most 'sporting' drop in the cave) this year thanks to Don's finding a high bypass.

The objective was Camp II, located located in a flat, sandy area above the East Gorge. Along the way disaster struck as Steve took a three meter head-over-heels fall with his duffle, breaking a couple of ribs. Fortunately, he

was able to largely move himself out of the cave over a period of five days with the assistance of everybody in the area (and even some people not in the area, such as Noel Sloan and Bill Steele) at various stages. Although he was unable to do anymore caving in Cuicateca, Steve recovered sufficiently to continue with his plan to lead a return expedition to Jul Mas Nim in Guatemala later in March.

After this chaotic and unfortunate start, the first camp team quickly pushed beyond last year's endurance limit. From camp 1.5 kilometers of passage, five drops, and several climbs through the rapids of the main stream brought the group to the end of last year's exploration. After the sporting Swim Gym the cavers followed a narrow rift that led to a sump and increased the depth of the cave. The system has seven sumps so far, but in each case there is a dry upper level bypass. Backtracking as usual to find where the air had gone, they began by pushing over the top of the Widowmaker drop to find a large room, and canyon passage over the Swim Gym. After locating a more direct route by climbing directly out of the Swim Gym, the final trip of the camp surveyed the Hall of the Restless Giants, a borehole filled with massive cracked formations. This ended in a terminal flowstone choke, with good leads through some breakdown at an intermediate level. Team one exited after nine days underground, having added 1.4 kilometers to the length and 42 meters to the depth of the system.

Next team two, comprised of Rolf, Bob, Jeb, and Bill Stone, headed in for a four day stint. They easily pushed through the breakdown, making their way through some very nasty passage to eventually discover the Black Borehole, named for its dark rock. Surveying over 800 meters on their last trip, they ended at another breakdown choke, which Stone described as the worst he had seen in years.

Undaunted, Don, Bill Farr, and Nancy went in to check it out. After almost two hours of worming thought the boulders, Bill moved a rock and squeezed "Through the Looking Glass" into the A.S. Borehole, the



Susie Lasko rappelling down the 4-meter drop before Angel's Falls

largest passage discovered in the cave to date, reaching up to 40 meters high and 40 meters wide. Like the Giant's Staircase but larger, this breakdown-floored borehole descends at a 30° slope. At places in the floor it is possible to descend to the main stream, where the water soon sumps. Joined the next "caving" day by Andy, Matt, John and Todd, the team split into two survey parties, and surveyed both upstream and downstream in the A.S. Borehole to net 1.6 kilometers of passage in a day, all over a kilometer deep! Downstream the A.S. Borehole ends in a large breakdown pile with strong airflow.

Matt and Andy began stage-derigging on the way out from camp, with derigging completed the next day by Bill Farr and Tim.

Osto de Puente Natural

At the beginning of the expedition Puente was 422 meters deep and showed every indication of eventually connecting to the system. In general, the passages in Puente are narrower, requiring frequent chimneying, and the drops tend to be more awkward than those in Cheve. But one of the goals of the expedition was to connect the two caves. Early in the expedition a trip by Bob, Jeb and Bitsy and a subsequent trip by Andy and Tim pushed Puente to a tight slowy-descending canyon. Then a marathon trip by Rolf, Louise and Bill Stone pushed through some of the tightest canyon yet discovered in the system, and surveyed 117 stations in a largely-horizontal stretch of passage at -560 meters. Several times the passage narrowed to the point where it was nearly impassable, prompting some to speculate that Puente might become too tight before ever reaching Cheve. Nevertheless, the three cavers were stopped not by a tight fissure but by an impressive shaft, The Major Abyss.

There was only time for one more trip to Puente before the end of the expedition; it was 'connect or die'. Carrying 250 meters of rope, Rolf, Bill Stone and Carol made a final assault on the cave near the very end of the expedition. After rappelling the 118 meter Major Abyss they followed the stream canyon down six more drops. At one spot breakdown nearly halted their progress. With only seven meters of rope left, they finally connected to Cheve at a small infeeder on the east side of the big, breakdown-floored room just above the 23 meter drop into the East Gorge. Rather than head back through Puente immediately the three cavers decided to head deeper into Cheve to Camp II where they met the others who were just returning from their big survey trip to the A.S. Borehole. As this was the last day in underground camp, everyone celebrated by eating as much of the remaining food as possible.

Cueva de Viento Frio

On the trail beyond Puente lies some of the best karst in the Pápalo area. Located by Peter

Bosted and Carol, the inconspicuous entrance to Viento Frio (Cold Wind Cave) lies at the base of a grassy sink northeast of Puente. Trips by Peter, Carol and Mark pushed the cave down seven drops to a depth of 200 meters. The longest drop is an 80-meter-deep fissure. There are two infeeding passages into the cave so far, and the passage size is generally more spacious than neighboring Puente. Exploration stopped after a stretch of canyon passage led to the top of another drop estimated to be about eight meters. The cave has good air-flow and will be a prime objective on next year's expedition.

Coates

The double entrances to Coates (Twin Cave), located at a higher elevation than Puente, generated a lot of enthusiasm. Mark and Carol descended the 20 meter pit just inside the larger entrance to a breakdown room. After finding a way through the breakdown, they followed the air down three more pits to another area of breakdown, which they were not able to get through. Later Mark, Carol, and Tim returned to push the pit just inside the second entrance. This trip was abruptly aborted when, despite precautions, a rock careened down the pit and hit Mark on the lip. His injury required several stitches. The pit at the base of this shaft remains to be checked.

Resurgence Areas

Prior to the arrival of the rest of the group, Don spent two weeks backpacking through the area, setting dye bugs in the major springs as he went. Then Bill Farr dumped optical brightener into the main stream in Cheve for a dye trace. Three weeks later, Don, Mark, and Carol traveled to the two most probable resurgences to retrieve the bugs. Unfortunately, they were negative. However, the trip was still productive as the trio found and completely explored one little cave near the spring on the Río Seco and located three blowing caves near the resurgence on the Río Santo Domingo. A return trip by Bill and Carol at the end of the expedition was cut short when Bill got very ill while surveying. However, over 300 meters

was surveyed in Cueva del Mano, with strong airflow and many leads left, although the way into the heart of the mountain is not immediately obvious. Unfortunately, the dye bug came out negative again. Either the spring on the Río Santo Domingo is not really the resurgence for the cave, or, more likely, there was not enough dye or enough time for the dye to travel the 17 kilometers from Cheve to the spring.

Other Caves and Surface Work

Surface work was conducted in three different areas: a recon by vehicle to check out the karst around Joya Durazno in an attempt to locate mid-level entrances to the system, all-day hikes to the upper reaches of the Aguacate valley to inspect the karst there and further work around the Puente Natural karst. The Joya Durazno area revealed several caves, none of which seem likely to readily connect into the system, if ever. The Aguacate valley hikes proved disappointing, as the streams come of the metamorphics only to sink into cobbles at the limestone contact. However, the Puente karst is quite fruitful with several leads awaiting serious pushing next year.

Summary

In total, Osto de Puente Natural is 2.5 kilometers long, 887 meters deep and contains 23 rope drops. The connection between Puente and Cheve added 27 meters of depth to the system. To get to the present end of the system requires 57 rope drops.

Sistema Cuicateca is currently 16.3 kilometers long and 1243 meters deep, the second deepest in Mexico and the eighth deepest in the world.

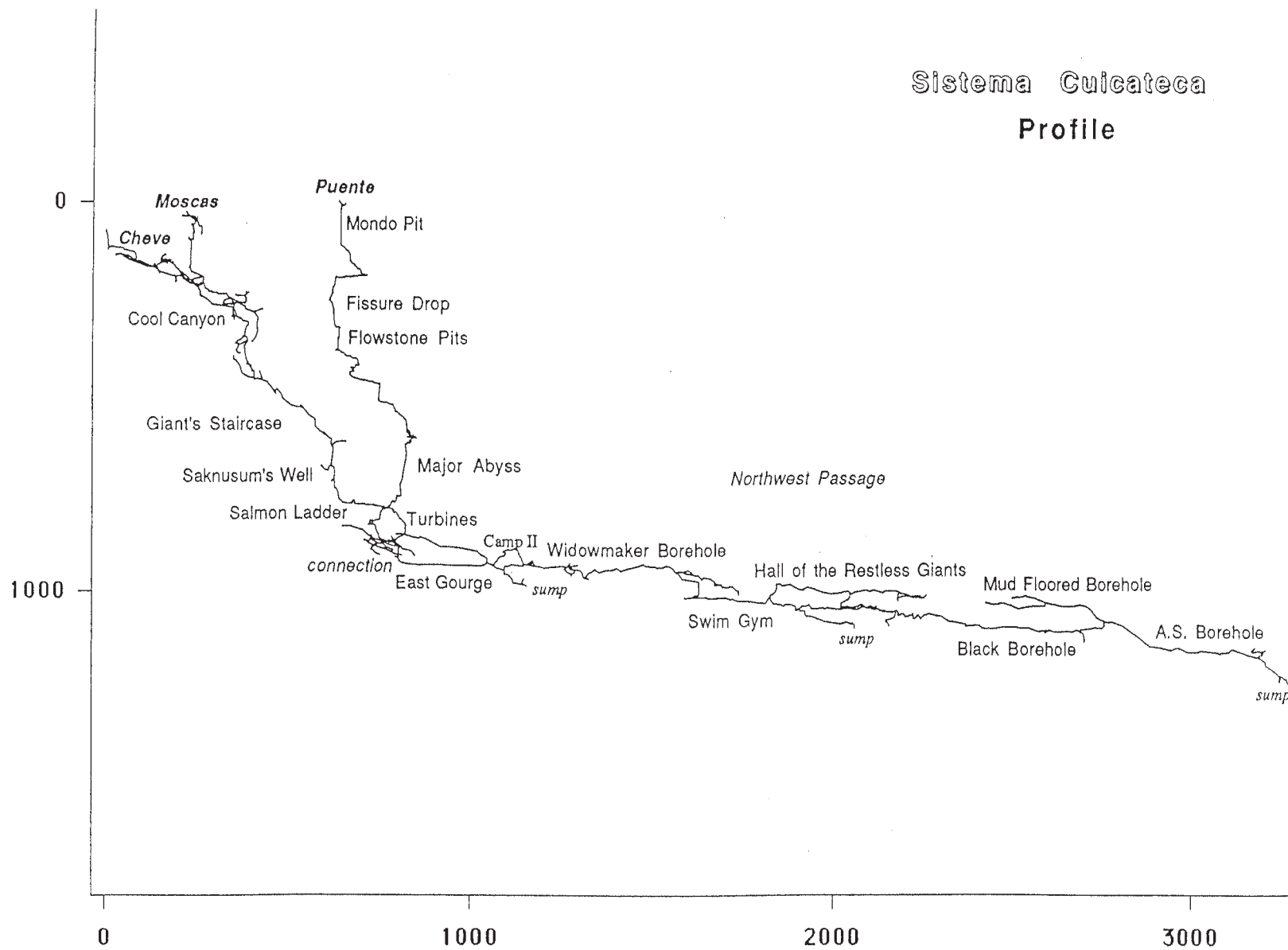
Sponsors

The members of the Proyecto Pápalo '89 team wish to thank our sponsors for their generous donations: NDC Systems, Bob & Bob, the Art of Climbing, Dogwood City Grotto, and the NSS Exploration Fund.

Concepcion Papalo
29-Mar-1989

90°x 90°y 0°z
scale in meters

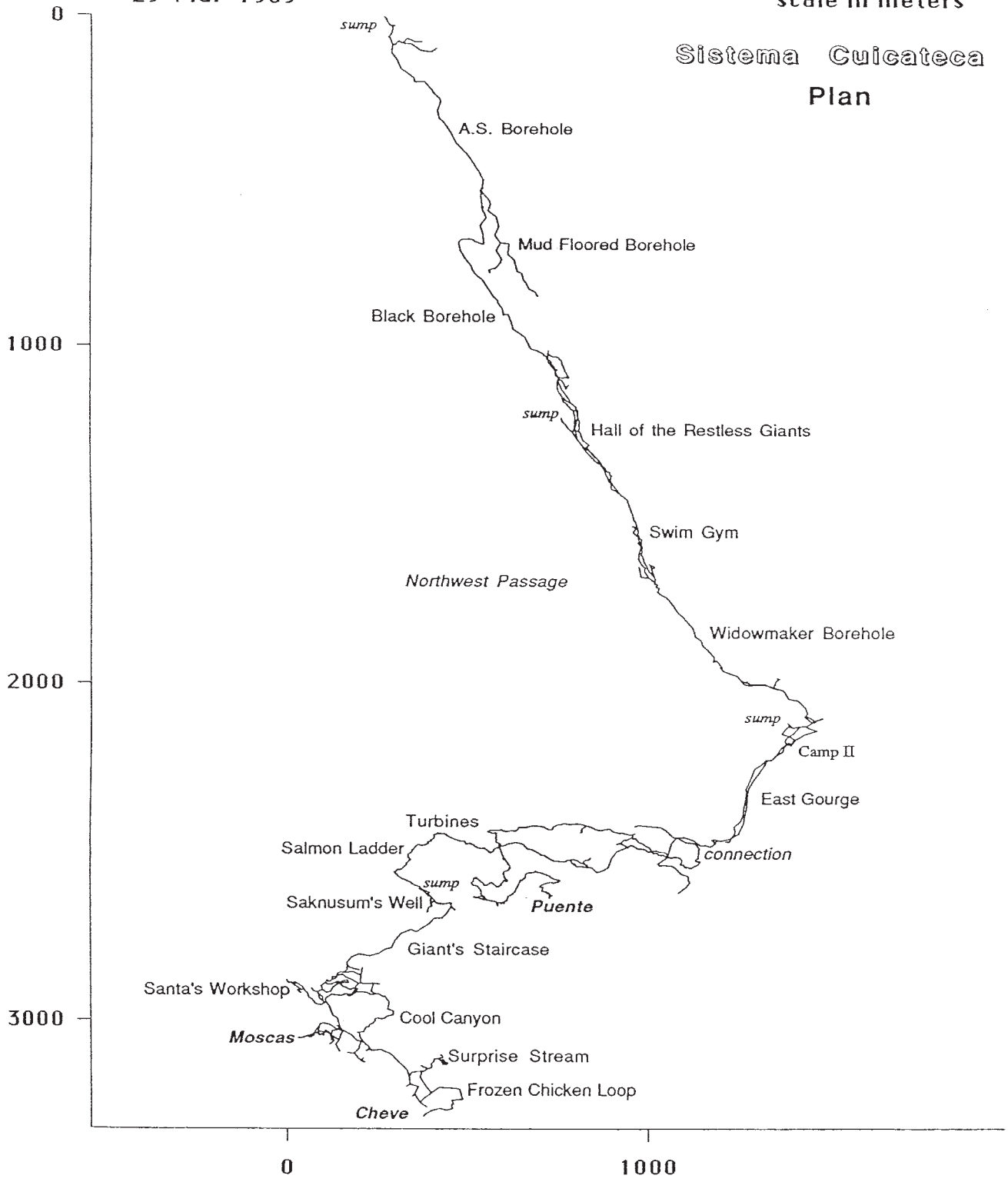
Sistema Cuicateca Profile



Concepcion Papalo
29-Mar-1989

0°08N 0°07y 0°02Z
scale in meters

Sistema Cuicateca Plan

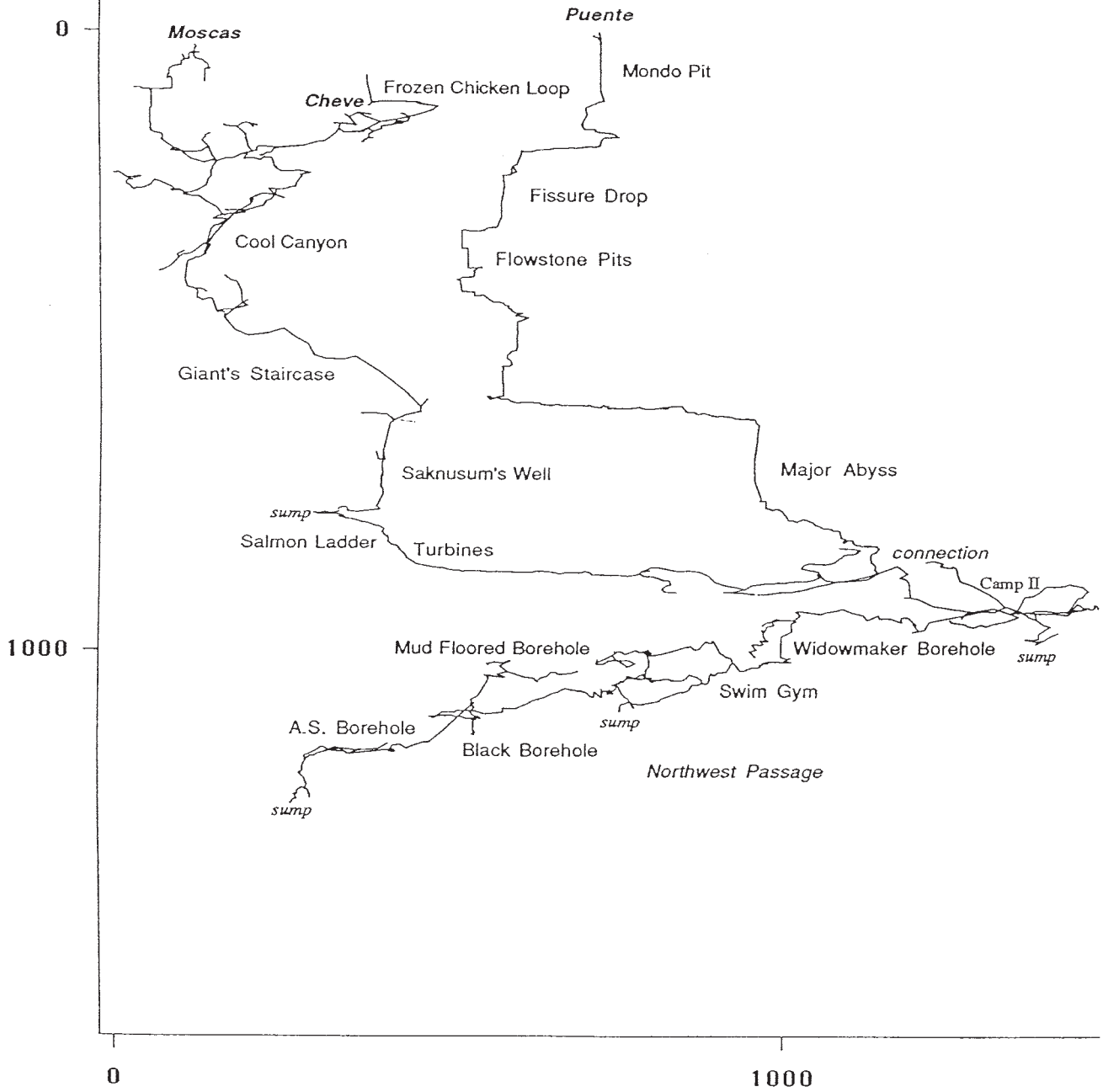


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90°øx 0°øy 0°øz
scale in meters

Sistema Cuicateca Profile



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