

November 1991

## Alaskan Caver, Volume 11, No. 5, November 1991

Curvin Metzler

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# The ALASKAN CAVER

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Membership is open to all interested in Alaskan cave discovery, exploration, description, survey, mapping, photography, hydrology, morphology, biology, geology, history, speleogenesis and other speleean processes, conservation, management, adventures, and the fellowship of Alaskan cavers. Annual dues are \$15 for individual or \$20 for family membership. Add \$8 to dues if overseas and airmail postage is preferred over surface. Institutional subscriptions are \$20 per volume (6 issues).

Dues are due on January 1 and are sent to the Treasurer (address below), payable to Glacier Grotto. Those joining for the first time between October 1 and December 31 will be considered paid through the following year. Dues status is indicated on the mailing label. Anchorage meetings are held at 7:30pm on the second Wednesday of each month (location information on back cover). Meetings held in other areas are not regularly scheduled, and may be arranged through the appropriate Vice President.

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\* Messages may be announced to Kevin daily via radio station KHNS at (907) 766-2020

† The area code for Dave Klinger in Leavenworth, Washington is (509) (both numbers)

Cover: Denise Ward in El Capitan Cave, 1988 (POWIE II). Photo by Carlene Allred.

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## **Tongass Cave Project Becomes NSS** by Julius (Jay) Rockwell, Jr.

In keeping with arrangements made with the NSS Internal Organization Committee, the Society's Research Advisory Committee (RAC) and the Northwest Caving Asso., the Tongass Cave Project is being transferred from the Glacier Grotto to the RAC, effective December 15, 1991.

The letter of termination of the Grotto's agreement with the U.S. Forest Service, dated November 15, appears to the right. Members of POWIE V have been personally notified of the transfer of leadership, assets and liabilities.

This transfer is not an abrupt one. At the inception of the POWIE series, in 1988, in discussion with Evelyn Bradshaw, Internal Organization Chair, and Janet Thorne, NSS Conservation Chair, the future possibility of making it an NSS project was considered. It was decided, at that time, to carry it as a Grotto function for a limited time to see if it would develop into a larger program. In what appeared to be an exponential increase of annual activity, the magnitude of the last summer's work demonstrated that it should be handled by the NSS itself rather than by a single Grotto. Turning it over to the NSS will enable Grotto management to devote more attention to other Grotto activities, which have become increasingly neglected.

Thus, the Grotto as an organization will not participate in POWIE VI, but urges its members to apply as individuals for the opportunity to help on this outstanding project. Kevin Allred will continue as Project Leader; those interested should contact him as soon as possible.

I take this opportunity to thank each of those who have contributed to any POWIE in any way what-so-ever for your help and support. While we have not yet figured it all out, I am under the impression that the extent of the POWIE V surveys may have been close to a record. The effect of this work in concert with the outstanding effort of the U.S.F.S. may prove to be the beginning of an all-time high in cave conservation efforts.

See if you can top it next year!

## **Challenge Cost Share Agreement Termination** extracted from Forest Service reply to Grotto president Dr. Julius Rockwell, Jr.

"We are writing to inform you that the Ketchikan Area of the Tongass National Forest is terminating the Challenge Cost Share...dated May 25, 1990, between the Area and the NSS, Glacier Grotto. This termination is possible under part C(1.) of the agreement. This termination frees the Glacier Grotto and the Forest Service of all agreed responsibilities. We understand that you support this action which was discussed in your phone conversation with James F. Baichtal, Forest Geologist, on November 7, 1991.

"This termination in no way reflects any Forest Service dissatisfaction with the role that the Glacier Grotto has played in the organization and running of the Prince of Wales Island Expeditions. The Forest Service can not begin to thank the Glacier Grotto for its cooperation in exploration and evaluation of the abundant karst and cave resources on the Ketchikan Area. The intent of this termination is to release the Glacier Grotto from the requirement to organize and conduct the annual...expeditions. We hope that the Glacier Grotto will be the principal player in all future expeditions.

"[We]...will replace the...agreement with [one] between [us] and the NSS...

"The dedication, expertise, and accomplishments of the past POWIE participants has contributed greatly to the advances in cave management on the Area. NSS Project Status will bring news of the resource and planned expeditions to a national audience. With wider exposure of the accomplishments of the TCP, even more national expertise can be drawn upon to help the Forest Service in evaluation of the karst and cave resources on the Area. The Forest Service feels that this change will allow the Area to better manage and conserve the cave resources.

"Again, it is the Forest Service's hope that the Glacier Grotto will be a principal player in upcoming expeditions and will continue to provide expertise in cave management techniques, conservation, caving safety, etc."

## Summer 1990 European Caving Adventure

story and photos by Curvin Metzler

In late May (1990) I left Anchorage for Copenhagen, the point of entry for my summer travels in Europe (map on page 16). Plans were to spend the summer visiting friends, seeing sights, practicing Swedish, and spelunking. After a week of visiting friends and museums in Denmark, I got on board a train to Berlin.

My stay in Berlin was short, with time again spent visiting friends and museums. But many changes were taking place in the busy former capital city during the summer of 1990. One change was that the Berlin Wall was being torn down, and I could not pass up an opportunity to take part in such a historical event. So I rented a hammer and chisel and chipped away at "The Wall" for a little while. Then it was back on the train again, this time bound for Poland.

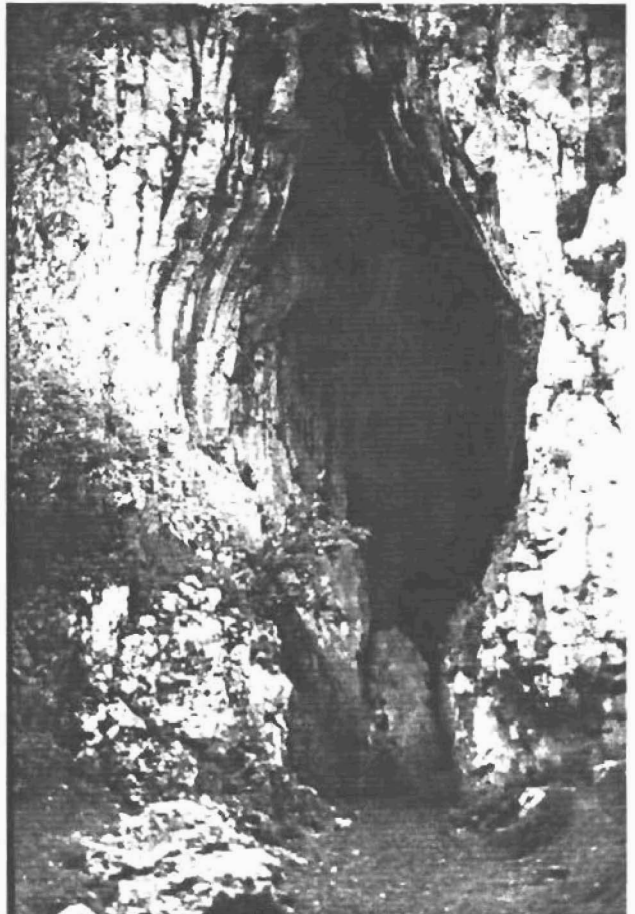
### Poland

Since the train arrived in Krakow at 0530, I decided to wait around until the banks opened so I could change money and make a call to Andrzej (Andy) Wito, my spelunking contact in Poland. While waiting at the station, I was spotted by a man who had ridden in the same railroad car with me from Germany. He wondered if I needed any help, and I explained that I was waiting to call a friend. He attempted to help me by putting a coin in the telephone coin slot and asking me for the number to my friend. I reminded him that it was still very early in the morning, and explained that I did not want to awaken my friend. His reply, not knowing that I had not yet met my "friend", was: "If he's your friend, it's no problem."

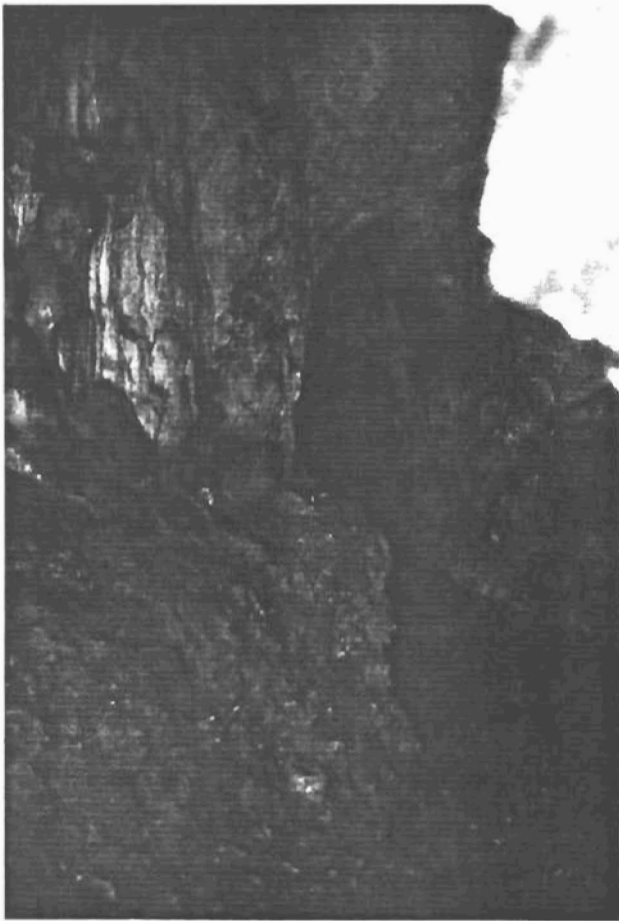
Andy altered his schedule so that he could pick me up at the train station. He also arranged for some of his friends to show me around the town of Krakow, the tour including lunch at the "Cave Cafe". After work, Andy gave me a tour of the castle, Wawel, which stands on a limestone hill built upon as early as the ninth century.

There are caves under the castle; one of them is called The Dragon's Den. According to a legend, there was once a dragon that lived in a cave under the castle and savaged the people. They had to offer it cattle daily, just to satisfy its appetite and avoid its wrath. King Krak and his sons attacked the monster several times, but were not successful. So they resorted to trickery, and gave it skins filled with burning sulfur in place of the cattle. After greedily swallowing the offering, the dragon died of suffocation from burning within.

The next day, July 9, Andy took me to three caves: Wierzchowle Cave, King Cave, and Bat Cave. Wierzchowle Cave has been excavated; in fact, Andy was one of the workers who spent many hours



Main Entrance to Wierzchowle Cave.



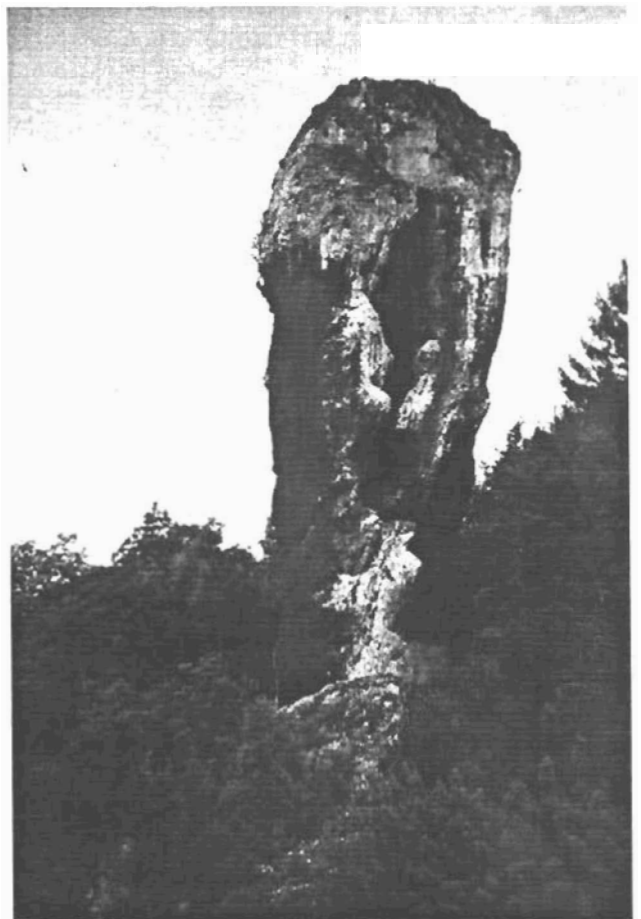
Cave Passage with an Excavated Floor.

patiently digging through the sediments which filled the passages of the cave. In the fill were found many bones and teeth from species which have long ago become extinct. The list of species includes mammals such as hyenas, lions, and bears, all of which had lived in the cave at one time. The bears bones and skulls were identified as those of the European cave bear, of the species *Ursus spelaeus*. There was also evidence that man had occupied the cave during a certain period of time in the cave's prehistory.

The second cave, King Cave, which lies in Narodowy National Park, is famed for long ago having saved the life of a Polish king. According to the legend, King Lokietka was attempting to escape from enemies pursuing him when he came to the entrance to the cave. There was

a spider web spanning the entrance, but the king was quite short and was able to squeeze by without disturbing it. The king hid in the cave while the enemies approached the cave entrance. When they arrived, they noticed that the spider web was still intact. They assumed that the king had not entered the cave, and hurried on by. The king remained hiding inside the cave for some days afterward, until there was no longer any danger.

While traveling between caves, we saw many cave entrances and karst features across the karst landscape. One of the most striking sights was Hercules' Club, a pinnacle of limestone shaped like a club and towering high above the trees. Later, we visited Bat Cave, which has a walk-in entrance and contains some nice formations and a few bats. Some of the formations are black in color, due to mineral impurities.



Hercules' Club.

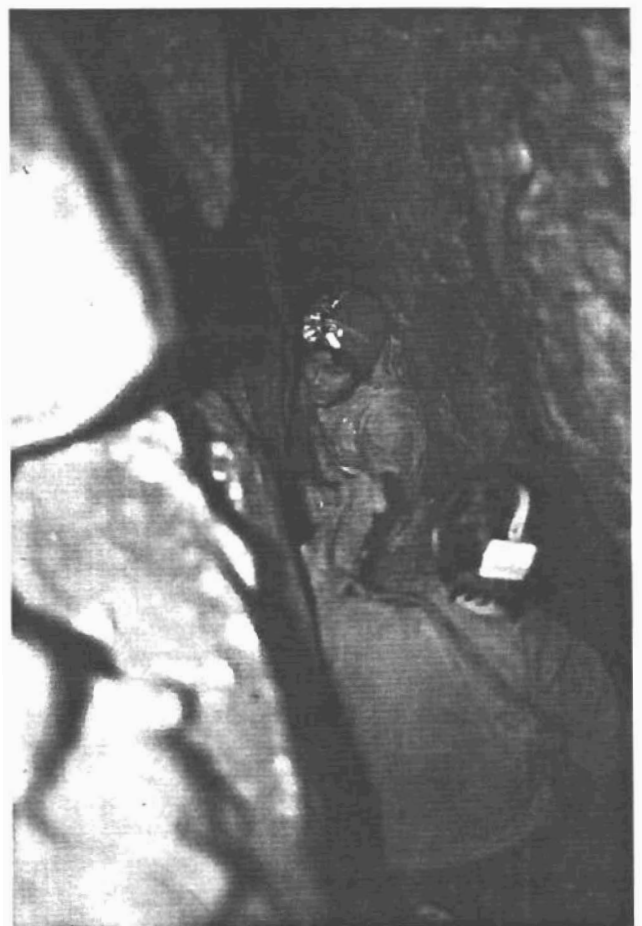




Rappelling into Frog Cave.

The next day, June 10, Tomasz and Voytek, friends of Andy, joined us in a trip to three more caves. The first, Frog Cave, starts out as a shallow pit entrance inhabited by some species of frog. The second, Terrace Cave, begins as a small opening behind a boulder in a five-foot-diameter depression in the middle of the forest. It then continues as a nearly vertical crack about fifty to sixty feet deep which must be dropped in order to reach the rest of the cave.

It was already evening by the time we finally reached Coral Cave, the last cave which we explored during our long



Traversing in Terrace Cave.



Andrzej, Tomasz, Voytek at Entrance to Terrace Cave; Tomasz Deep Inside.



Voytek Entering Coral Cave.

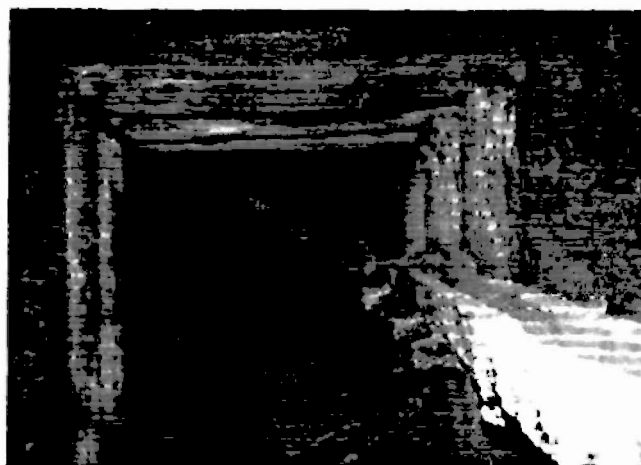


Formations in Coral Cave.

excursion. We rigged the entrance pit with a rope and also a ladder made from two cables with metal crossbars. The cave was the most beautiful of the caves I had seen so far in Poland. We climbed out of the cave in the dark and headed home, reaching there about 0200, in the early morning of the next day.

Andy and I got up late on June 11, played tourist by visiting the castle Wawel again, and finally drove a little ways to visit the Wieliczka Salt Mine. This ancient mine has been active for seven centuries, and is the only mine in the world to have been active continuously from the Middle Ages until today. It contains some 200 miles of chambers and shafts, including lakes and even a large cathedral, located on nine levels and at depths of over one thousand feet.

On June 12, Andy and I drove to Zakopane to go for a hike in the Tatra Mountains, which lie along the border between Poland and Czechoslovakia. We saw lots of wildflowers, got some great



Wieliczka Salt Mine.



views from the top of a high peak, and even got to check out the entrances of a few caves. The next day, we visited the museum in Krakow; then I took the train to Wroclaw (Breslau), stopping for a few hours before taking another train to Pardubice, Czechoslovakia.

### Czechoslovakia

I arrived in Pardubice early in the morning of June 14, and met Leo (Saki) Zak at the train station. Later in the day, we drove, along with a friend of his named Jeff, to the Bozkov Dolomite Caves, located in Bohemia, where we met another friend of Saki named Dusan. The cave is very beautiful, and therefore has been made into a tourist cave.

On the way back, we visited a sandstone pseudokarst area which is known to contain several small caves. They are the closest caves to Pardubice, and are the responsibility of the Saki's speleological research group. Although there are no limestone caves in the immediate area, members of the local speleological society exchange with other groups from all over Czechoslovakia. Thus, we were able to see caves in Bohemia and Moravia and visit with people in these areas who have known Saki for a long time.



Beautiful Bozkov Dolomite Caves.

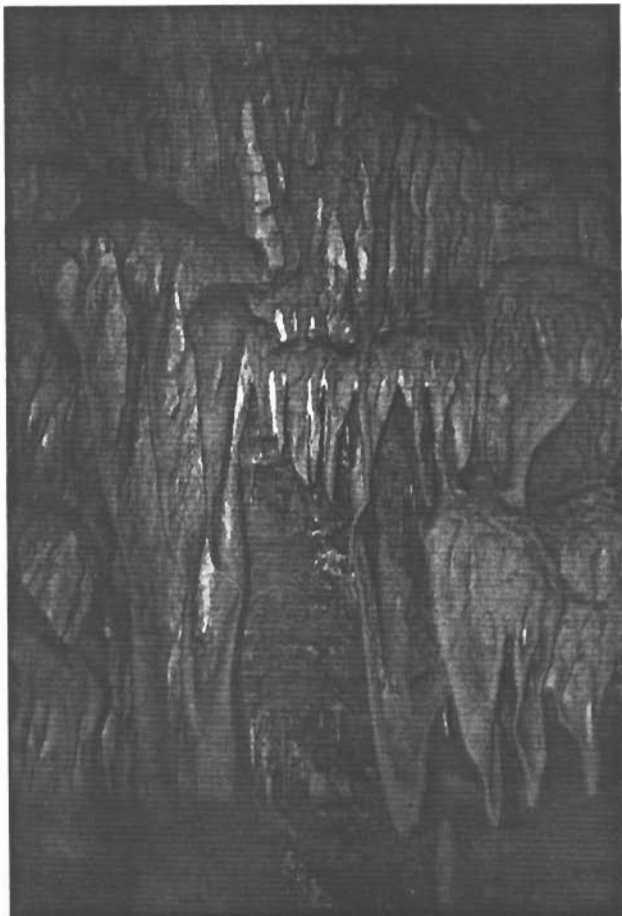


Stalactites and Stalagmites in Bozkov Dolomite Caves

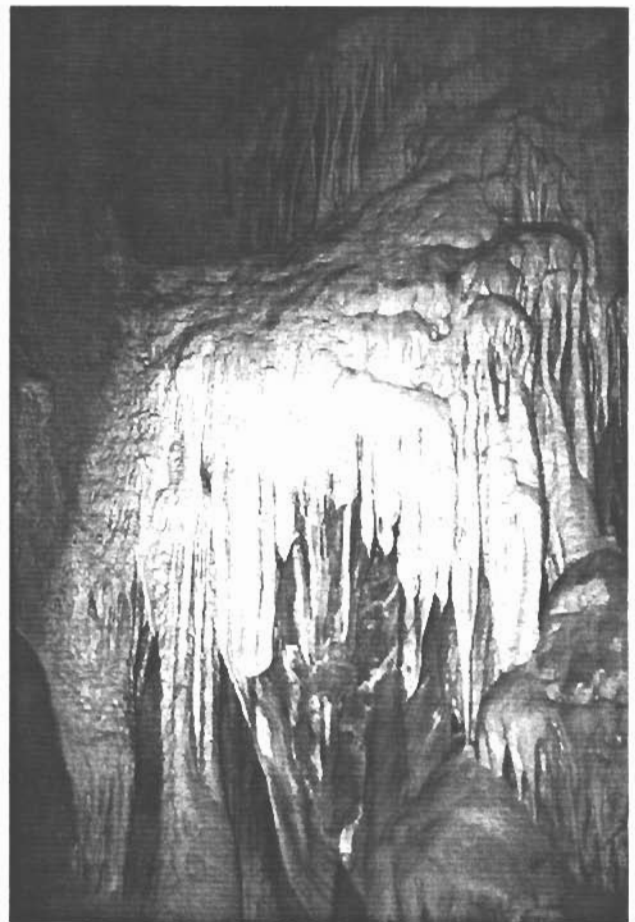


Sandstone pseudokarst.

The next day, June 15, Lojza joined Saki and Jeff and I for a drive to the Moravian karst region. We visited the Javoricske Caves, which rank among the most beautiful in Czechoslovakia. We



A View in Javoricske Caves.



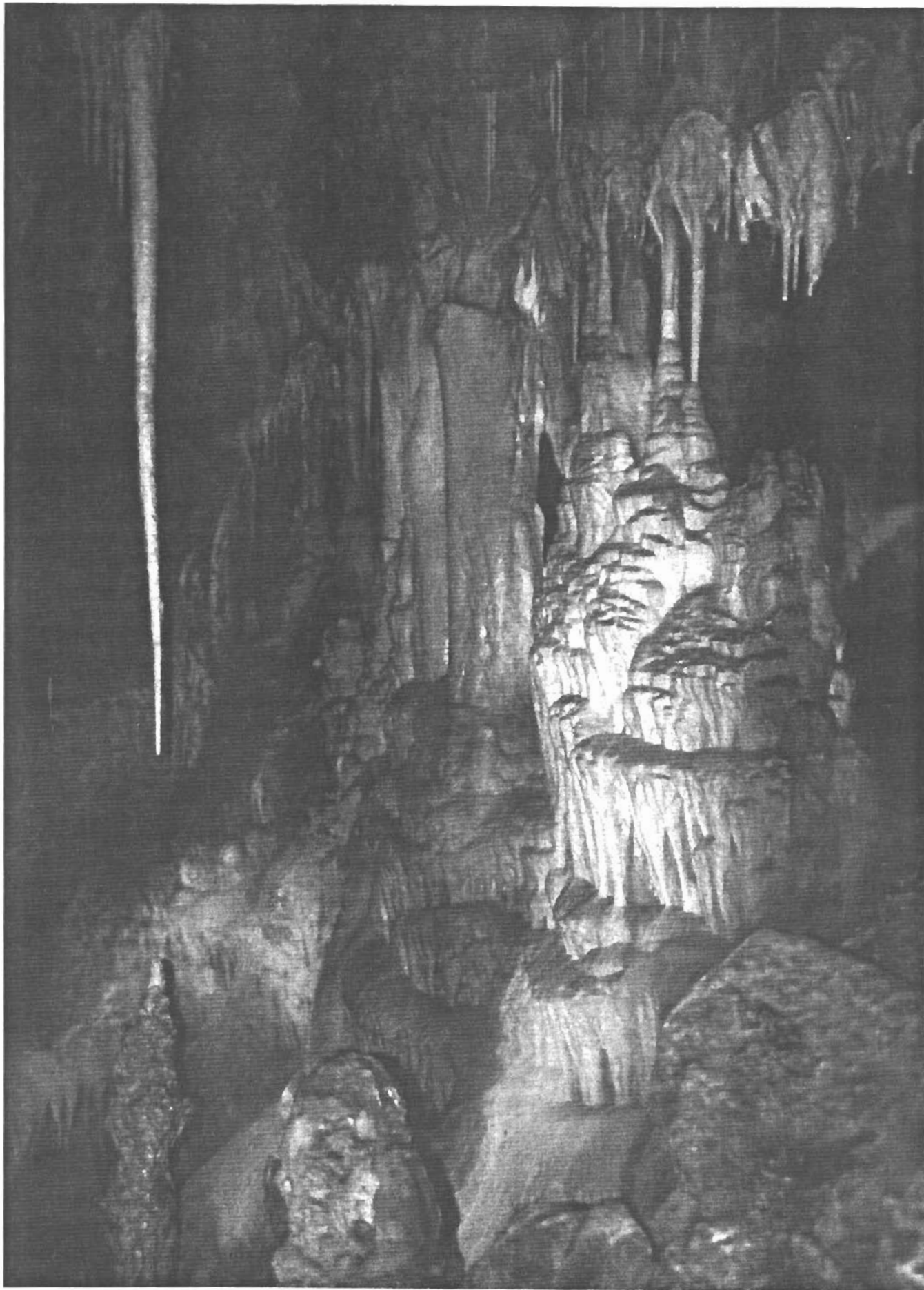
"Cascades" in Javoricske Caves.

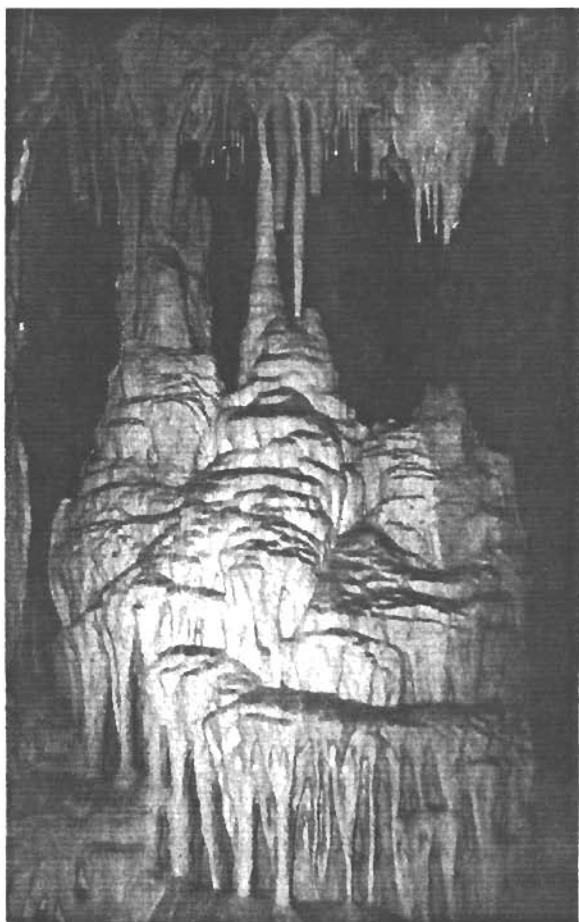
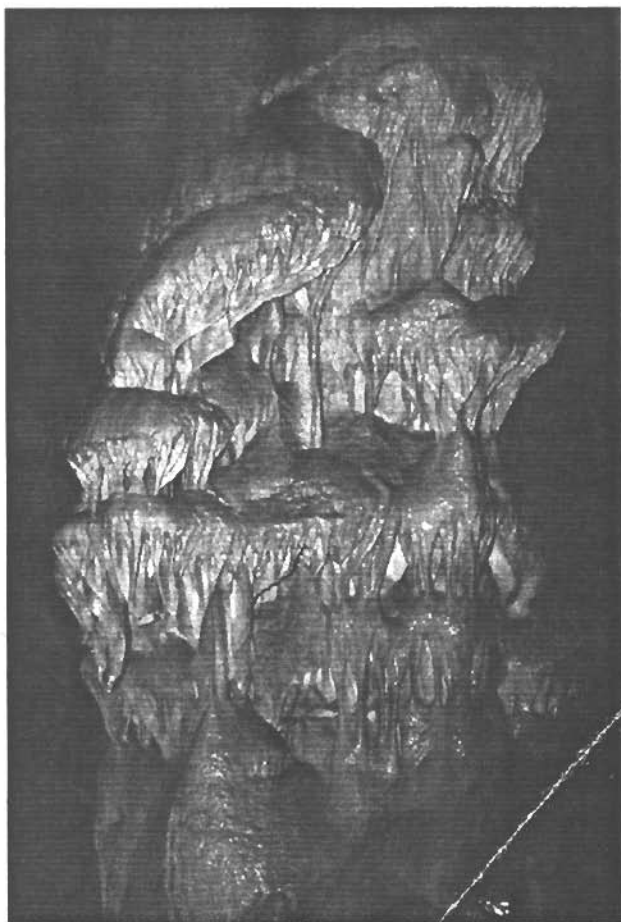
wanted to visit another tourist cave in the area, but got there too late. So we checked out a karst tower with a small tunnel going through it instead.

Then we drove on to the village of Holstejn, which lies north of Brno, to see the nearby Holstejska Cave. We met some of the people living in the area who are active in the local spelunking club. Saki and I went for a walk to see the ruins of a castle up on top of a cliff.

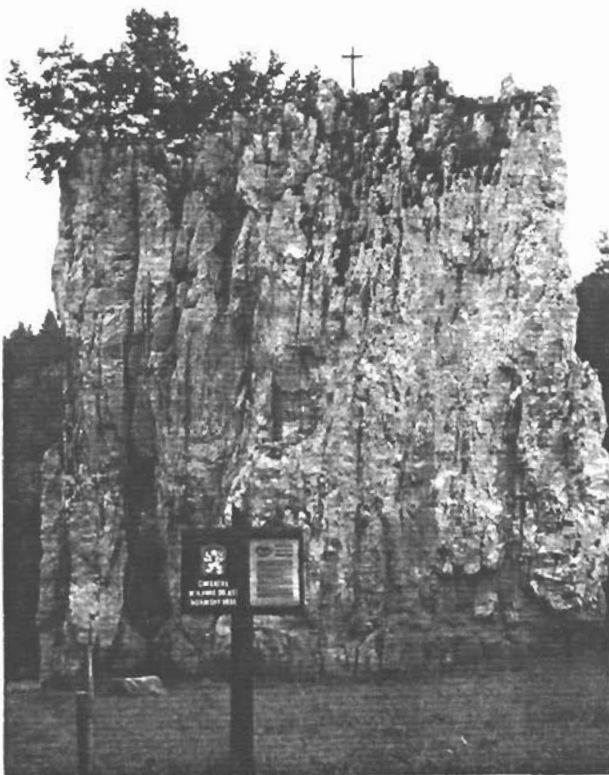
Under the castle was a shaft which led to a dungeon—a large chamber which had been sealed off for many decades. One day, long after the castle had been abandoned, someone noticed that part of the rock at the base of the cliff was not natural, but had been placed there

The following photos capture the beauty of Javoricske Caves. ==>>





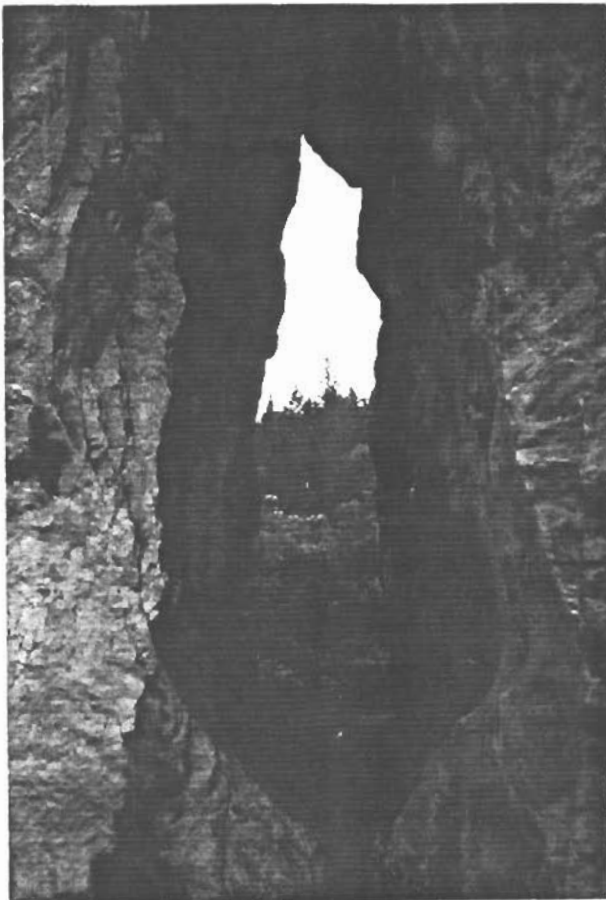




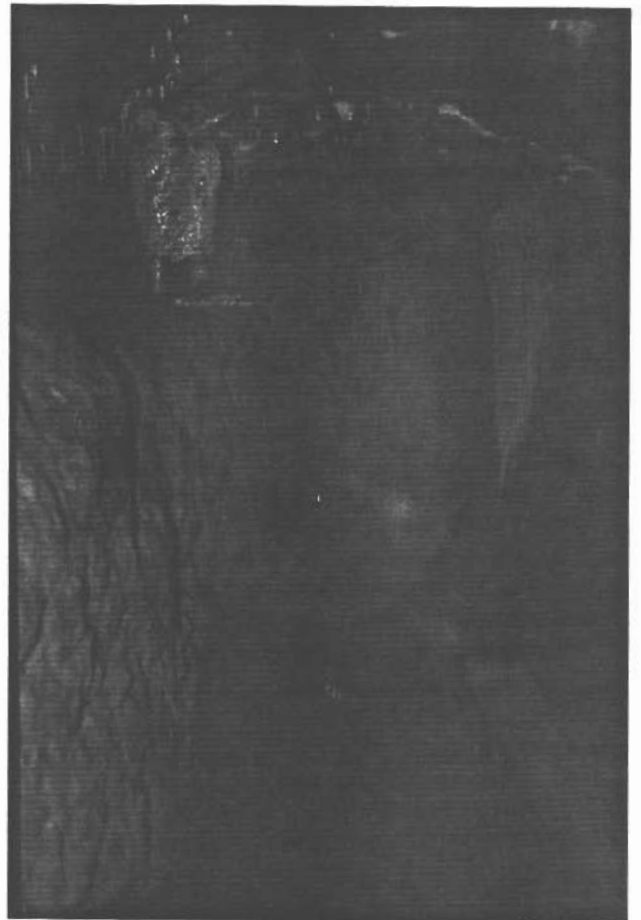
by man. When the material was removed, a cave was found, containing skeletons of many people who had been imprisoned in the dungeon long ago.

Saki and I took a look at where the stream goes underground and where the overflow water enters yet another cave. A professor named Karel Absolon explored caves in this area in the early 1900's. He noted that local streams ran underground for twenty miles around, and predicted that a large underground cave system would be found in the area. This system was finally discovered in 1969, but lots of work is still going on.

The next day, June 16, we toured part of Holstejska Cave, which follows a horizontal cavity barely a foot high. But the lower surface lies on top of at least five or six feet of sediments. Energetic cavers have dug out passages into the sediments in an attempt to



Karst Tower and Close-up of Tunnel.



"Man-made" Passage in Holstejska Cave.

reach the main system, and they have been digging since 1966—for 25 years! Afterwards, we drove to Punkevní Cave, which contains a large abyss, Macocha Chasm, about 450 feet high. This is a tourist cave, where part of the tour is on foot and part is by boat. After the tour, we returned to Pardubice for a dinner and slide show.

The following day, I had to take a train back to Berlin, so Saki took me to Prague for a tour before I left the country. The capital city was, like the rest of the country, in a state of transition, since the communists had essentially disappeared as a result of the events which had taken place in the past year. In fact, it was interesting to note that the names of the subway stations were being changed from the names of communist leaders back to the original names of the local districts.

### Sweden

After a few days in Berlin, I drove with a German guy and a Polish guy in a carpool from Berlin to Sassnitz. There we caught the ferry to Trelleborg, then drove to Stockholm, where I looked up an old friend from Fairbanks. The next day, I took the train to Uppsala, where I visited friends and took a refresher course in Swedish. I studied there for four weeks, with weekend trips to Dalecarlia (Borlänge, Rättvik, Leksand), Västerås, and Stockholm. Then I headed to northern Sweden, going by train via Borlänge, Göteborg (Gothenburg), Oslo, Trondheim, and Mo i Rana. From there I went by bus to Strimasund (which lies at the Norwegian border, in the southern part of Swedish Lapland, known as Tärna-fjällen), arriving on July 29.

The rest of the way was by foot, carrying an eighty-pound pack, starting with the crossing of Lake Överuman via a foot bridge. Camp for the first part of the expedition was located roughly four miles further, on a mountain called Artfjället. Walking to the caves, about 500 yards from the campsite, I noticed a note tacked to the middle of the trail. It contained four lines; the first read

"pivo", which I recognized from having been in Czechoslovakia a month before. The next line read "fat öl", which was in Swedish; the third line read "beer"; and the last line read "500 m" (meaning 500 yards ahead).

I arrived in camp to be greeted by my friends from Czechoslovakia handing me a bowl full of beer. The beer was pivo from Czechoslovakia, and came from a keg which was being kept cool in a pool of meltwater from snow uphill. I found it amazing that anyone managed to get it into Sweden in the first place (actually, it was another group of Czechoslovakians who were responsible). And I was also surprised that anyone would bother to struggle to carry it the four miles up to camp even after getting it into Sweden.

The primary target of the first part of the SSF (Swedish Speleological Society) mountain meeting was Sotsbeck Cave. On July 30, the day after our arrival into camp, Rabbe Sjöberg gave an introductory tour of the karst area. After some hole-checking, some of us explored Clay Cave, in a trip led by Rolf Engh.

The next day, July 31, a few of us explored Sotsbeck Cave, which contains some really nice rock layer patterns, and



Czechoslovakian Cavers "Skål" with "Pivo" in Northern Sweden.





A Typical Cave Entrance; Rabbe Sjöberg.

some impressive hoodoos. There was also a skeleton of a lemming resting nicely in a little clay depression—and guess who forgot to bring his camera. We also went down a pit which led to a waterfall and stream, then on to a room containing a mound of snow, and some icicles. It was so sunny and nice when we got back out of the cave that I went on a long hike south to a lake. Along the hike I spotted many reindeer antlers and took lots of photographs of wildflowers.

On August 1, a few of us walked the six miles over a ridge to the camp for the second part of the expedition, which is located in an area called Mieseken. Some Swedish cavers, such as Lars-Erik Åström, whom I first met back in 1984, were already camping there. A couple of us quickly checked out some caves in a pair of dolines which we had spotted during our hike to the second camp.

The next day, August 2, a number of us explored Labyrinth Cave, again under Rolf's leadership. There were lots of formations, including some odd-looking statues made of travertine. Passages were quite long and, in some instances, very straight. After exploring the cave, a couple of us went on a hike in search of caves on top of a large ridge.



Evert Jeansson Entering Labyrinth Cave.



Travertine Statue in Labyrinth Cave.

Upon our return, we attended the regular evening gathering around the campfire.

Half an hour before midnight, I started hiking the seven miles back to the road. I had to catch a bus south early the next morning, so I wanted to be certain that I could make it on time. I reached a large stream that I needed to cross at just after midnight, about the darkest part of the night. I could not see well enough to determine where the rocks were, and ended up falling face first into the water.

Back on my feet, I quickly carried my pack (in my arms) across the stream, and kept walking. My clothes were all soaked, but the air was fairly warm and I was not cold until I stopped walking a couple of hours later. Everything in my backpack had been wrapped in plastic garbage bags in case it rained, so all my gear was still dry. My sleeping bag was dry and warm, so I got a few hours of good rest before hiking the rest of the way out. Once I realized I could make it to the bus on time, I stopped along the way to pick cloudberry and take pictures of bog orchids.

After hiking with the friend from Fairbanks in Sweden's "most wildflower-rich valley", the weather turned bad. So we headed south, and I visited some friends in Uppsala and Stockholm, then took the train back to Germany. I went to Munich (München), then to Stuttgart, and finally to Frankfurt, before flying back to Anchorage. x

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### **Minutes of Glacier Grotto Meeting**

Anchorage Area, November 13, 1991

Ten members were in attendance. There were reports from the officers (treasurer's report), followed by committee reports (POWIE V, Alaskan Caver).

John Jansen was appointed program chair. The next meeting was voted to be a Christmas potluck at Art Eash's place. A Chitistone trip was planned for Spring Break, March 6-15, 1992. Glacier caving trips were planned; calendars ordered.

**[Author's Note:** I cannot help but make mention of the immense hospitality shown to me by the people in each of the three countries that I visited in Europe during the summer of 1990. For all the advice, service, transportation, guiding, food, books, friendship, and much more, I am truly very deeply indebted.

In Poland, for example, Andy was willing to make an effort to organize nice trips for me with his friends, and to take time off from work to go on them himself. I thank his mother, as she had breakfast ready for me every morning, packed a lunch for me to take along with me on the trips every day, and had a nice hot meal waiting for me every evening. Even the day that we returned to the apartment at 0200, she still was awake and waiting with a hot meal.

In Czechoslovakia, Saki also took the time off to show me all around, and introduced me to his caving friends. He would not let me pay for admission prices at show caves or meals at restaurants, and drove me to different karst areas in Bohemia and Moravia. Both Andy and Saki gave me a stack of books and information to take back and basically would not let me pay for anything.

In Sweden, I have known the cavers for a longer time, and have already been a recipient of their hospitality. This was actually my fourth trip to Sweden, including one trip in which I stayed for a full year and studied at the University of Uppsala (1985-1986). Lars-Erik and Rabbe, as well as other Swedish cavers, have been very helpful to me both during this trip and on previous trips.

Both Andy and Saki hope to visit Alaska next summer and take part in some expeditions in various karst regions in our state. I will attempt to return at least a fraction of the hospitality that I was shown, but it will be difficult to duplicate it in its entirety. Anyone who would like to be of some assistance in making the trips a little cheaper for them, by providing a place to stay, or transportation, or a meal here or there, I'm sure it will be appreciated. I know what it's like visiting a foreign country and will certainly do as much as I can.]

Map Showing Travel During the Summer 1990 European Caving Adventure.





## Basic Cave Surveying in Alaska

by Carlene Allred

In our great state of Alaska, we cavers encounter some special problems because of the inaccessibility of limestone areas. Unfortunately, most of our trips must be in the form of organized expeditions even though we may prefer the "spur of the moment" informal style. On the other hand, the remoteness makes Alaskan caving very appealing, and we have discovered that expedition-style caving can be a lot of fun. Because our caving areas are expensive and difficult to get to, we must take extra precautions to make sure that our survey notes are of high quality and without blunders. We cannot simply dash back into the cave to resurvey something once we are back home. While on our expeditions, we have been plotting out as much gathered data as possible to ensure completeness and catch blunders.

Why make a map of a cave? Here are some possible reasons:

1. You may need something to do while caving to keep from getting bored.
2. Turning out a cave map is the only proof that you have really explored it. It is also proof of length and depth measurements.
3. Careful sketching of passage features in a notebook results in a more thorough exploration method. Good surveyors usually find things that mere explorers overlook.
4. The mapped layout of a cave may be important to surface concerns such as logging impact, road building, waste disposal, etc.
5. Cave maps are used for studies in biology, hydrology, geology, etc.
6. A nicely-done map may give worldly credibility to a cave when that is desirable.
7. Putting together the data and drafting the map can be a lot of fun.
8. By studying a cave map, one can quickly become familiar with the basic characteristics of a cave. A good map can be followed underground, and this is especially im-

portant to rescue teams.

9. Mapping as many caves as possible may be like counting coup. The more the better.

Different individuals and organizations use differing methods and formats when surveying caves, and the results vary in quality and map type. When mapping a cave, be sure to have in mind the way the cave will be portrayed on the final map. For example, a pit cave will need to have a good profile drawn with exact depth measurements, because on the final map the profile view will be more important than the plan view.

Some surveyors produce only line maps which, in my opinion, are very dull. A line map shows only a single line to represent a passage of survey line. This type of map is necessary, though, when the map of a giant cave must fit on a standard size piece of paper. Line maps of three-dimensional mazes look like indecipherable scribbles, but they do show cave bounds and joint patterns. Surveying for this type of map will go quickly, since no time-consuming sketching is needed.

Detailed maps show a variety of features within the passages and have many uses. If the surveyors do a thorough job, then several types of maps can be drafted from a single set of notes. An example of this would be the maps put out by the Lechiguilla Project. We all have seen the computer line maps published in NSS News. There is also a multi-color version produced by a computer that portrays passage depths. In addition, the project is also producing beautiful hand-drawn detailed maps in quad format, at one inch to fifty feet. Three-dimensional maze areas are being portrayed in multiple levels. I don't know how many quads there are at this time. Cavers are using copies of these detailed maps to get around underground. As a sketcher for that project, I was required to "sketch to scale" in detail, both plan and running profile, in each

passage we explored. For this I needed a protractor and ruler for in-cave computation. I found this method to be exhausting and very time-consuming, but we produced a thorough set of notes. Also, by sketching to scale, the blunders are supposed to be caught and corrected while on the spot.

#### In the cave

Dress warm. The other members of your team won't appreciate it if the trip gets aborted because someone is cold. We spend a lot of money getting to our caves and we hate to see it wasted.

Each survey team involves a number of jobs. There needs to be a recorder, an instrument reader, a sketcher, two tape stretchers, and a lead. One person can do all of this in solo fashion, but this is lonely and time-consuming. A typical team will consist of three people. One person will be the instrument reader and tape holder, another person will serve as sketcher and recorder, and the last person will be the tape holder and lead. In a crawlway, too many people can get into each other's way, so a team of two will be better in this case. A team of four is nice in large passages.

The easiest job is the lead and tape holder. This person determines stations, pulls the tape ahead, says "chain", and shouts out the length of the shot if he/she is holding the reel end. This is my favorite job, but invariably I always end up being the sketcher instead. Stations may or may not be marked, but they need to be chosen with the positioning of the instrument reader in mind. Many cavers, including me, think that marks on walls deface caves, so flagging tape can be used instead. Some people make a spot of carbide soot at each station, and in some caves this can later be wiped off. If you aren't able to completely finish mapping an area of a cave, then you must leave a temporary or permanent station that can be relocated. It must be such that it will not be washed away by floodwaters or be disturbed by someone. This can be an obvious point on a landmark that can be

described in detail in the notebook. It may be good to have these scattered throughout the cave for future references. Also, remember that there should be a station at the entrance for surface tie-ins. In some projects, markers are left at every single station. As you determine stations, be sure that you place one on at every side lead.

Sketching takes the most amount of time and is always the bottleneck of the survey. Not everyone can sketch, so good sketchers are always in high demand. It is a good skill to have if you want to get into someone else's project. The survey cannot progress any faster than the sketcher can sketch, so the sketcher controls the survey. He/She is responsible for making sure that every nook and cranny gets looked into and that all passage features get recorded, such as drops, airflow, ceiling features, streams, geological observations, bones, leads, fill, etc. (see figure 3). When you use nonstandard symbols, be sure to include a key in your notes.

Sketching can be done to scale (see figure 3 for an example by Win Wright), not to scale, or something in between. The person who drafts the final map likes to work from notes that are to scale (proportionate and directional) because they are easier to understand. This is particularly nice when the sketcher is someone other than the drafter. Personally, I prefer to sketch maze areas to scale to eliminate my own confusion, and simple linear passages not quite to scale to speed things up. Be sure to sketch at a scale that is as large or larger than that of the final draft. For caves in southeastern Alaska, we have found that the best scale to sketch at is one inch to twenty feet. For large rooms, the sketch takes several pages.

The instrument reader uses a compass to measure azimuth (or bearing) from point to point, and an inclinometer to measure inclination or vertical angle. Kevin and I have found that we get best accuracy using a Brunton, medium accuracy using a Silva Ranger with clinometer, and lowest accuracy using Sisteco instruments. Speed of use is in reverse

order. Use whatever works best for you. For even higher accuracy, use a tripod-mounted compass. The instrument reader needs to watch out for magnetic fields which may deflect the compass needle. At our home we cannot survey our own property because of all the magnetism in the rock below. Items such as headlamps, reflectors, and pocketknives can cause errors if they are too close to the compass. Test yourself with all your gear on to see if your gear has magnetic fields which affect your instruments.

There are backshots (BS) and foreshots (FS). The latter means that azimuths and inclinations are from a lower-numbered station to a higher-numbered station as you progress into the cave. On a backshot you sight instead from a higher-numbered station to a lower-numbered one. In some surveys both foreshots and backshots are taken between all stations for accuracy. This method may create extra confusion for some.

The distance from point to point is measured with a fiberglass tape. Steel tapes tend to break easily. Kevin and I prefer a fifty-foot length of tape. In most Alaskan caves tapes tend to wear out earliest in the first sixteen feet of the tape, and rarely is a bulky hundred-foot tape needed. We prefer to work in feet and tenths for two reasons. A foot is a good unit for cave measurement estimations. For example, the distance (approximately) from a point to the left wall of the passage may be called simply two feet. If meters were being used, it would be called 0.6 meters. We think that decimals are awkward to work with when the surveyor is tired and muddy. For point-to-point measurements, we like to use tenths of feet because of ease in future computations. Use whatever units you feel most comfortable with if you are going to draft your own map.

Note the spaces on the right-hand column (in figure 2) for measurements from point to left wall, right wall, ceiling, and floor. These measurements denote passage width and height and are very important. There are two ways to record these. Be sure to indicate in the notes which method you use, A or B.

Method B should only be used if you are sketching very close to scale and doing profiles. Kevin and I prefer method A. We like to use 4-1/2 x 7 -inch printed "Rite in the Rain" notebook paper when we can get it. Actually, any blank sheet of paper can be made to work.



### Styles

Cave surveying can be done in one of three styles:

1. Survey what has been explored on a previous day.
2. Explore your way in, survey your way out.
3. Survey as you explore.

Current custom among cavers dictates that we survey what we explore. That usually means both jobs in one trip. In times of old, cavers explored first and then mapped on a later day. That meant that a few lucky people quickly explored all the cave and left anticlimactic mapping for others. Combining these tasks saves time in the long run and provides incentive for mappers. This is especially important for us Alaskan cavers.

If you choose to explore in and survey out, the tedious mapping doesn't interfere with the ecstasy of exploring virgin cave. The only drawbacks are:

1. You may not have time to survey all that you explored.
2. Then others would call you "Scooper" and you might end up with a worthless hanging survey.
- (3. Also, your survey numbers will run backwards.)

If you decide to survey as you explore (as is the most common method used today), then you survey exactly what you



explore and no less.

When you leave the cave, the first thing you need to do is go over all of your notes and make sure that everything is clear and readable while it is still fresh in your mind. If your notes are left in someone else's pack, then there is a good chance that you will never

see them again. As soon as you can, copy everything and place each copy in a separate depository. Otherwise, you may lose your only copy.

Now draft up your map.

The easiest way to learn and to understand all this is to do it. Go practice on a local glacier cave, mine,

TONGASS CAVE PROJECT		TONGASS NATIONAL FOREST, ALASKA	
CAVE: <u>BLUING IN THE WIND CAVE</u>		Data Entry Date/Initials	
AREA OF CAVE: <u>POWIE NORTH FACE OF 2424 PEAK</u>		✓	
OBJECTIVES: <u>SURVEY TO TOP OF ROOM DROP</u>		DATE: <u>7/29/89</u>	
SURVEY DESIGNATIONS:			
SURVEY STATIONS:		TIE INS:	
<u>B1-B9</u>		<u>BEA3</u>	
<u>C1-C3</u>		<u>C1-B5</u>	
<u>D1</u>		<u>1</u>	
PERSONNEL: <u>WIDE WRIGHT</u>		Tape's Units of Measurements:	
*denotes leader		Tenths <input checked="" type="checkbox"/> Inches <input type="checkbox"/> Meters <input type="checkbox"/>	
SKETCH: <u>WIDE WRIGHT</u>		SCALE OF SKETCH: <u>1:50'</u>	
INSTRUMENTS: <u>MILES HECKER KEVIN ALLRED</u>		Compass Type & ID: <u>BRIDGES'</u>	
LEAD: <u>RICK BRIDGES STEVE MIER MILES HECKER</u>		SUMMITAS	
BACK:		Compass Test: IN: <input type="checkbox"/> OUT: <input type="checkbox"/>	
OTHER: <u>380.5</u>		Clinometer type & ID:	
DATE & TIME IN: <u>7/29 13:30</u>		DATE & TIME OUT: <u>21:30 7/29</u>	

Figure 1.

STATION	TONGASS CAVE PROJECT		
	DISTANCE	BEARING	VERTICAL ANGLE
A3		FB	FB
B1	17.8	285	-66
B2	17.2	FB 136	FB +10
B3	8.3	FB 170	FB +10
B4	13.6	FB 134.5	FB -10
B5	27.0	FB 143	FB +5
B6	27.0	FB 135.5	FB -21.5
B7	7.6	FB 209.5	FB -38.5
B8	30.9	FB 294.5	FB -7.5
C2	30.6	FB 244.5	FB -0.5
C3			

Figure

or other cave.

For more information, here is a reading list:

Thomas, Woodrow. September 1990. Why Survey? NSS News 48(9).

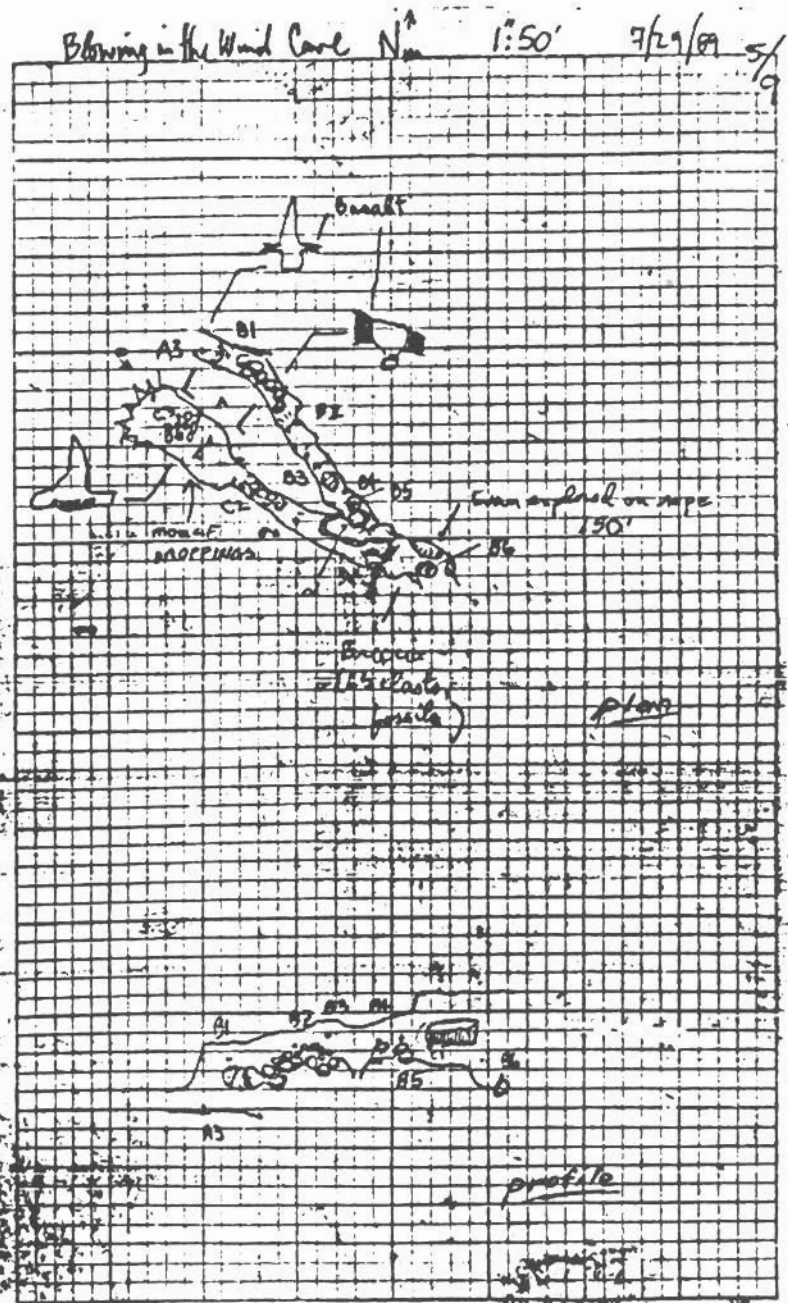
Ganter, John. June 1989. Will We Map As We Survey? NSS News 47(6).

Compass and Tape\* Volumes 1 and 2 (for basic information)

Compass and Tape\* Volume 3 and onward (for more in-depth information)

\* Compass and Tape is a publication of the Survey and Cartography section of the NSS, commencing in 1983. ✕

LEFT	RIGHT	CEIL	FLOOR
40	15	1	
2	3	6	10
0	3	2	1
4	0	2	3
0	4	3	4
1	4	3	
10	5	15	5
80	0	7	
4	5	1	3
10	5	15	0



Glacier Grotto  
Area Meeting and  
Christmas Potluck

Glacier Grotto Meeting and Potluck  
for the SouthCentral Alaska Area  
at 6:30pm on Wednesday, December 11  
at the home of Art Eash, ph: 338-4209  
address: 4228 James Drive, Anchorage

take Tutor Road, go east toward Muldoon  
before curve, turn left onto Patterson  
at the church, turn right onto Madelynn  
go to the end (T), turn right onto James  
house at the first streetlight on right

anyone interested in caving is welcome  
bring choice of hot dish, salad or desert  
discuss and plan future expeditions

NSS slide show on Utah caving featuring  
Big Brush Creek Cave, the state's largest

### Schedule of Events

11 December -- Christmas Potluck (SCent)  
?? December -- Chitistones Expedition

## December Chitistone Expedition

Jim Nichols of Fairbanks announced plans for a trip to the Chitistones in December. Anyone interested in going along on the expedition should contact him immediately; phone number 474-0104.

## Dues are Soon Due

Don't miss a single issue of The Alaskan Caver; renew your Glacier Grotto membership for 1992 today; don't delay!

## Glacier Grotto

2944 Emory Street  
Anchorage, Alaska 99508-4466

Address Correction Requested