PHOLEOS

Journal Of The Wittenberg University Speleological Society

Volume 24 (1, 2) May, 2006

WUSSes in Kyoto, Japan

PHOLEOS

Pholeos **(**Greek - *cave)* is a biannual journal of the Wittenberg University Speleological Society (WUSS), an internal organization of the National Speleological Society (NSS).

Purpose

The Wittenberg University Speleological Society is a chartered internal organization of the National Speleological Society, Inc. The Grotto received its charter in May 1980 and is dedicated to the advancement of speleology, to cave conservation and preservation, and to the safety of all persons entering the spelean domain.

WUSS Web page

http://www4.wittenberg.edu/student_organizations /wuss/

Subscription rates are $10 a year for two issues of *Pholeos*. Back issues are available at $5.00 an issue.

Exchanges with other grottoes and caving groups are encouraged. Send all correspondence, subscriptions and exchanges to the grotto address.

Membership

The Wittenberg University Speleological Society is open to all persons with an interest in caving. Membership is $10 a semester or $20 a year and comes with a subscription to *Pholeos*. Life membership is $150.

Meetings

Meetings are held every Wednesday at 7:00 p.m. when Wittenberg University classes are in session. Regular meetings are in Room 319 in the Barbara Deer Kuss Science Hall (corner of Plum St. and Bill Edwards Dr. - parking available in the adjacent lot).

Submissions

Members are encouraged to submit articles, trip reports, artwork, photographs, and other material to the Editor. Submissions may be given to the Editor in person or sent to the Editor at the Grotto address. Guidelines for submitting research papers can be found on the inside back cover of this issue.

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Editor's Note

Hello my fellow cavers and spelunkers! This year has been another exciting one for WUSS, full of our usual underground adventures (and above ground, for that matter, too) and quests. WUSSes have celebrated 25 years and we are still going strong. The summer of 2005 took us to Japan and allowed us to discover the spectacular caves and lava tubes as well as the majesty of Mt. Fuji. Of course, we also were able to fit in many amazing cultural experiences that we will carry with us for a lifetime. Survey work has been done in some of our "regular" caves and we've had some trips for fun. We have also had a few speakers come and share some different aspects of caving.

When I first was elected to the task of editor, I must admit I was pleasantly surprised to find that we were so busy. In the pages that follow you will find articles on surveying, our trip to Japan, a review on "The Cave" (a movie that we actually viewed in the theater), and research on cave fishes. We also wish to honor the memory of a few of our departed friends, and hope that their enthusiasm for WUSS and passion for the world underground are carried on for years to come. The year has been a fully thrilling one for us WUSSes and we can only hope for more great adventures in the years to come. As always, thank you for reading and cave softly!

Emmy Fink, Editor
WUSS #0534
NSS #56975

P. S. We get a lot of questions about our journal's name and its spelling. The word "pholeos" is Greek for "cave."
E.F.

FRONT COVER: The WUSSes first full day in Japan was spent touring Kyoto. Here they stop to pose in front of the historic Golden Pavilion. Photo by S. Smith

BACK COVER: The view from the bottom of Mossy Pit (see accompanying article on page 25). This is the most impressive and distinctive view of the pit. Photo by K. M. Kissell.

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PRESIDENT'S MESSAGE

How do you sum up a whirl wind year like the one that just blew by the WUSSes? As I look back on a year that has quite literally just flown by, I am presented with more than a few good memories. The summer brought with it many caving trips as well as an opportunity for nine WUSSes to spend two weeks touring Japan. We were able to visit Osaka, Kyoto, and Tokyo as well as climb Mt. Fuji and go caving in more than a few little holes in the ground including some very cool (no pun intended) ice and lava caves. The new school year started without a hitch; while we only picked up a few new cavers this year I prefer quality over quantity. The arrival of Labor Day sent a large group of WUSSes down to West Virginia for the Old Timer's Reunion (a.k.a. the Officer's Training Retreat.) The following months saw WUSSes gone nearly every weekend to such scenic locals as Carter Caves State Park, Sloan's Valley, Kentucky, and TAG. Three WUSSes and a Clevelander made the trip into Ellison's Cave to drop the 178 meter Fantastic Pit. A through trip of Ellison's from Incredible Pit to Fantastic Pit is currently planned for this summer.

January brought with it Crawl-a-thon and a surveying craze. Between January and February four survey trips were made to Carter producing six finished maps, three of which are published in this issue. As usual the WUSSes ventured into the white winter weather to go to Sloan's in February. No one lost any limbs to frost bite and we found a great Mexican restaurant at which to eat! Another year is winding down and exams are imminent. Plans are already being formulated, by those of us who cannot stay away, for summer excursions into deep dark places.

As summer approaches I cant help but feel both elated and a little poignant, for the people and characters (especially those from OTR) I have meet over the last year that left a mark on me. No, I am not talking about the marks left by Jared's whip at Crawl-a-thon but rather a lasting impression that I will never forget. I know it sounds corny but the caving community is not just full of friends, it seems we are all a big family. That is one of the most unique things about being a caver, I don't know of another group of people quite like us.

I hope as you read the twenty forth issue of *Pholeos* it brings back memories of your friends and family in the caving community. I hope you remember all your adventures both good and bad, and I hope you continue finding new adventures in which to partake. Finally I hope you remember you will always be welcome as long as you can smile and proclaim; "Hell yes I'm a WUSS!!!"

Kevin Kissell, President
WUSS #0530
NSS #54578

WUSS Members Receive Awards

Bill Stitzel (WUSS #0132, NSS #27643) was awarded the title of ***Fellow of the NSS***. This title is given to those members who, over the years, have exemplified through their actions their dedication to the goals of the Society. He also received the ***WUSS Appreciation Award*** at the 25th Anniversary gathering.

Lindsay Walker (McCullough) (WUSS #0469, NSS #48931) received the ***Mitchell Award*** for her paper on *The caves and cone karst of Abaco Island, Bahamas*. The James G. Mitchell Award is presented to an NSS member under the age of 25 for the best scientific paper presented at the convention.

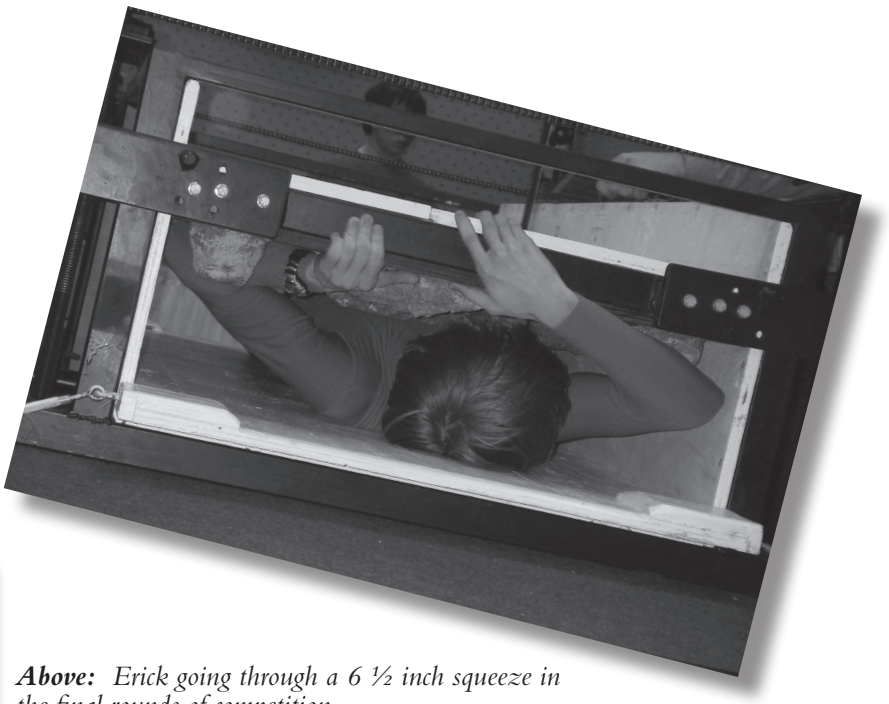
The June 2004 issue of ***Pholeos*** received an ***Award of Merit*** for the photographic section of the Cover Art Salon at the 2005 NSS Convention.

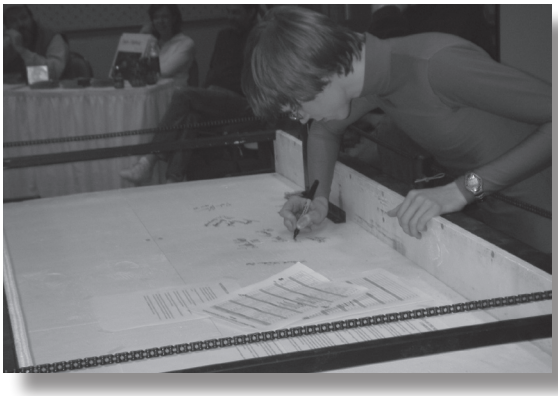
Vittoria Curl (WUSS #0497, NSS #23500) received an ***Honorable Mention*** for her *Full Moon Bat* in the 3D category of the Fine Arts Salon at the 2005 NSS Convention.

Mike Goltzene (WUSS #0135, NSS #50028) received the ***WUSS Appreciation Award*** at the 25th Anniversary celebration.

Victory! . . . Again!

For a second year in a row Erick Twaite took first place in his weight class in the squeezebox competition at Crawl-a-thon 2005. Erick completed a 6 ¼ inch run in less than one minute to cinch a victory over a shorter, younger opponent. Suffering only minor scratches and bruises Erick was able to sign and date the formidable squeezebox for a second time. All of us at WUSS would like to congratulate Erick and wish him good squeezing in the future!!!





Above: *Erick going through a 6 ½ inch squeeze in the final rounds of competition.*

Left: *Erick signs the Crawl-a-thon squeezebox for a second year in a row. Photos by K. M. Kissell.*

Life Members of Wittenberg University Speleological Society

Dawn Fuller Kronk (WUSS #0269)
Victor Fazio (WUSS #0045)
Howard Kronk (WUSS #0133)
Don Conover (WUSS #0356)
Bill Stitzel (WUSS #0132)
Rob Payn (WUSS #0362)
Naomi Mitchell Bentivoglio (WUSS #0116)
David Zimmerman (WUSS #0018)
Steve Kronk (WUSS #0136)
Scott Baille (WUSS #0168)
Rachael Beverly (WUSS #0191)
Connie Hand (WUSS #0541)
G. Sean Crossman (WUSS #0154)

Honorary Member

John Tierney (WUSS #0537)

W.U.S.S. Celebrates 25 Years

Kristen Baughman (WUSS #0464, NSS #48494)

On 9 April 2005 members of the Wittenberg University Speleological Society marked its 25th Anniversary. Alumni from far and near made their way back to campus to help commemorate a quarter century of W.U.S.S. achievements.

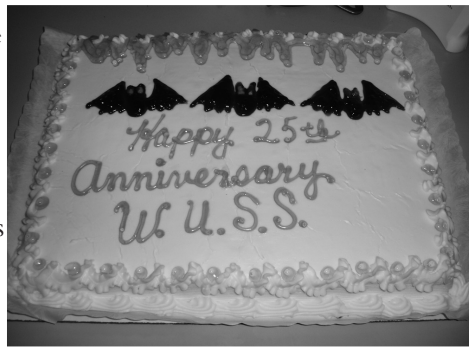
Appropriately, the festivities were kicked off with a trip to the Seven Caves near Bainbridge, Ohio. A gorgeous spring day allowed the group to meander through this area and poke their noses into its many small, commercially developed, yet enjoyable, caves. For some members this trip brought them back to their old stomping ground, as this area was the site of much survey work done by W.U.S.S. in the early 1980's. For many newer members it was an introduction to a beautiful area of Ohio that was practically in their backyard, yet never a place ventured during their tenure at Wittenberg.

Back in Springfield that afternoon there was a little time for folks to wander around campus and see what changes had been made, especially the wonderful new addition to the science building. The main event took place in the evening at Wittenberg's Shouvlin Center. Memorabilia and photos lined the tables sparking much conversation about the "old days" as alumni gathered to start the evening's festivities. A beautiful quilt hung on one wall made from old W.U.S.S. t-shirts; it was a really special way to show off those well-worn treasures we just can't let go to the ragbag.

Once seated, the W.U.S.S.es enjoyed a great meal and a chance to catch up with those at their table. The meal was followed by an introduction by the 2004-2005 club president Michelle Maxson. "W.U.S.S. Appreciation Awards" were presented to Bill Stitzel and Mike Goltzene for their ongoing dedication and service to the club. Bill's wife Polly accepted his award his behalf because he, unfortunately, had to be out of town for work during the event. Also presented, was a beautiful plaque bearing the names of all the W.U.S.S.es who have been given a Lifetime Membership to the club. Among those names are five new members who were inducted in 2005 (see page 3).

This group of past and present WUSSes enjoys the beautiful weather while on their excursion to Seven Caves during the 25th Anniversary Weekend. Photo by H. H. Hobbs.

This was followed by our keynote speaker for the evening, John Tierney. He is the retired naturalist from Carter Caves State Resort Park in Kentucky where W.U.S.S.es have been spending countless hours mapping, researching, playing, and making lifetime memories over the course of the organization's history. John's presentation turned out to be a delightful evening of interactive storytelling and song. He shared memories of his grandmother and life in the "old days" in Carter County, Kentucky. Laughter abounded as he reminisced about things such as how her jelly always tasted like apples—whether it actually contained any apples or not! Music was another memory of his grandmother that became a very important part of his life. He showcased his talents on the autoharp and got everyone to join in on the "toot-toot" part of "She'll Be Comin' Round the Mountain." Perhaps the most amusing part of the evening was the impromptu "jug band" he gathered at the front of the room. Among those featured in this "band" were former W.U.S.S. president and vice-president Beth Hagen and Erin Athy on washboards and the late Howie Kronk on the gut bucket. What a happy memory of our now departed friend Howie to take with us always! John's look at family roots, life, and true happiness was a heartfelt and lighthearted way to finish up the "formal" portion of the evening.



The party then moved on to the home of Horton and Susan Hobbs, the club's ever-gracious and welcoming "mother and father." This is where the real catching up and the "do you remember when's?" took place. All of the old faces got re-acquainted and met all of the new ones, re-strengthening the bonds that make the Wittenberg University Speleological Society a true family. A quarter century of stories were retold and everyone left feeling glad to have been a part of such a long standing tradition and looking forward to what the future holds.

This quilt was proudly displayed at the banquet by it owners Dr. Horton Hobbs and his wife Susie. It is made up of some of the best WUSS shirts from the twenty-five years of WUSSes existence. Photo by H. H. Hobbs.

Twenty-five years of Pholeos *were laid out for all to see during the banquet. Many WUSSes gazed fondly and reminisced about survey trips and caving events. Photo by H. H. Hobbs.*

Reflections above and below Honshu, Japan

Horton H. Hobbs III (WUSS #0001, NSS #12386 HM, CM, FE)

Ten individuals from Wittenberg University made up the group of WUSSes that traveled from 02-14 August 2005 to Japan, having received a Freeman Grant to support a trip to visit numerous cultural and karst features (see Figure 1). After a long flight beginning in Dayton, Ohio on 02 August (preceded by one cancelled flight, a quick dash to hop a replacement plane , and the usual "fun" in Chicago's O'hara) that terminated in Osaka we traveled by bus (our mode of travel for the duration) to Kyoto where Steven Smith (Figure 2), a Wittenberg University

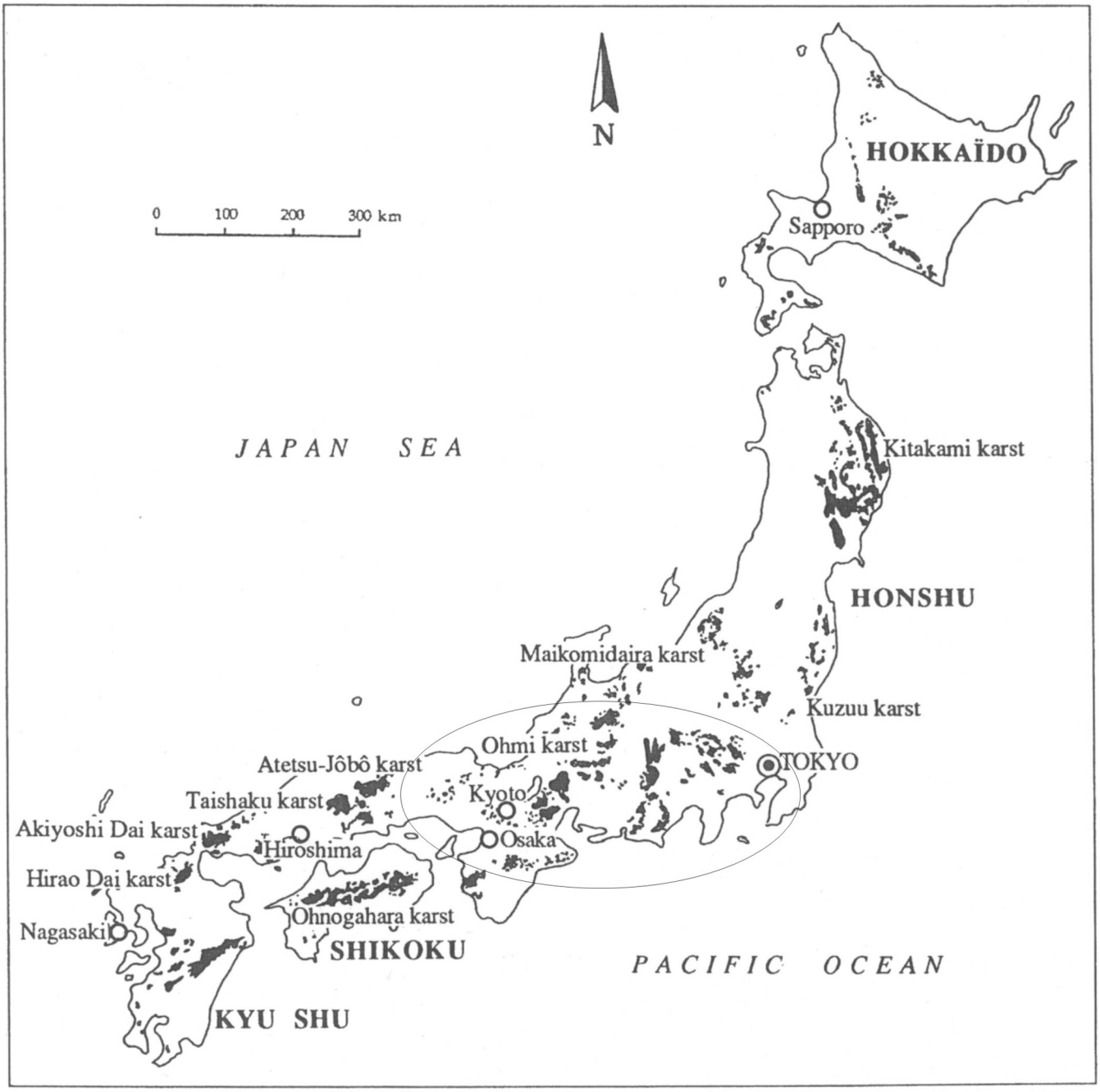


Figure 1. *Map of the distribution of karst (areas in black) in Japan (area within ellipse traveled by WUSSes).*

Figure 2. *Steven Smith standing at the entrance to Narusawa Icicle Lave Cave.*

Figure 3. *The Golden Pavilion at Rokuon-ji Temple in Kyoto.*

Professor of Sociology, treated us to several days of visiting numerous temples and shrines by foot, busses, and trains. These excursions were highlighted by the Golden Pavilion at Rokuon-ji Temple (Figure 3), the Fushimi Inari Shrine that required an enjoyable circular hike (Figure 4) as well as the Kiyomizu Temple (Figure 5) where we "partook of the water" on a sunny 99^{O}F afternoon. He did an excellent job giving us historical and current cultural perspectives associated with the city and various sites visited. Much food was enjoyed and/or tried by most although several within the group were vegetarians and thus were somewhat limited in "testing the local cuisine."

Saturday, 06 August, was a somewhat sobering time since this was the 60th anniversary of the United States dropping the bomb over Hiroshima, a place that we had originally planned to visit but a busy schedule did not permit travel to that part of Honshu Island, Japan. We departed Kyoto and met up with a former WUSS, Yuriy Fedkiw (Figure 6), 1999 Wittenberg University graduate who is working for the State Department in Tokyo. He played a very key role in helping to schedule the caving trips and giving WUSSes the opportunity to meet and cave with some of the Japanese speleologists.

Both limestone caves and lava tubes make up the diversity of caves in Japan. Most of the limestone caves are developed in Paleozoic and Mesozoic carbonate rocks throughout Japan although more recent Tertiary and Quaternary limestones are found largely in the southwestern islands as uplifted coral reefs. Because the Japanese islands were formed through volcanic activity, numerous lava tubes are abundant in such areas as Mt. Fuji and Hachijo-jima

Figure 4. *Fushimi Inari Shrine in southeastern Kyoto.*

Island (see Middleton and Waltham 1986, Courbon et al. 1989, and http://www.netlaputa.ne.jp/~ssj/index-e.html)

The drive from Kyoto to our first cave was nothing short of spectacular. We passed through numerous tunnels that sliced through the mountainous terrain and drove primarily alongside winding, flat valleys hosting small to medium sized towns demonstrating classical architecture as well as the ever present green of extensive rice fields (true nearly everywhere we went). The incredibly steep mountain slopes were covered with verdant cedar trees that were planted as a monoculture and harvested periodically for a variety of uses. The bus driver maneuvered precariously through the

twisting 1.5 lane road that followed the serpentine stream that coursed among limestone boulders below. We parked near the cave, Kawachi Fuketsu Cave, which is one that is commercial in the front section but several kilometers of passages lie beyond that are not shown to the public – this was our playground for about four hours (Figures 7-9). Lead by two members of the Japan Exploration Team- Yuriko Chikano (Figure 10) and Yuji Inagaki (Figure 11), we crawled, chimneyed, climbed, and scrambled among boulders, through vaulted halls, and up and down speleothem-coated passages (Figures 12, 13). With a little effort we observed a few small, highly specialized cave invertebrates (troglobitic springtails).

Figure 5. *Kiyomizu Temple.*

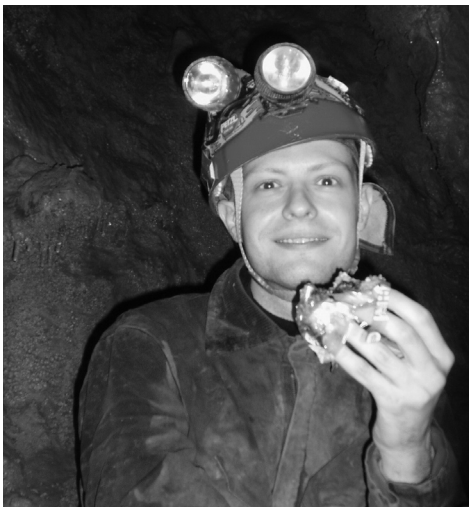


Figure 6. *Yuriy Fedkiw eating lunch in Kawachi Fuketsu Cave.*

We departed the cave and drove to the city of Takayama where we checked into a very nice hotel, a characteristic of the trip that never changed. We were no longer dealing with temperature and humidity readings that were in the 90's and the air was comfortably cooler and drier. Sunday morning, 07 August, was spent walking around a market as well as getting via bus to the Hida Folk Village. This was a festive time with large crowds celebrating the Festival of the Dead. That evening after enjoying bats in flight, fireworks, and a good meal we were caught in a rain storm as we walked from the restaurant to the hotel and all were soaked but invigorated by the somewhat adventurous run through the darkened streets.

Figure 7. *Group combining caving and culture are seen here bowing to the "Cave Gods" at a shrine prior to the trip into Kawachi Fuketsu Cave.*

The following morning we departed Takayama, and were reminded that this was the anniversary of the dropping of the bomb on Nagasaki. We drove south towards Gujo and proceeded to a show cave, Otaki Shonyudo Cave. The entrance

Figure 8. *Climbing down pit in Kawachi Fuketsu Cave.*

Figure 9. *Group picture in Kawachi Fuketsu Cave (left to right) Caleb Heimlich, Mr. Imazu, Rebecca Stewart,Yuriko Chikano, Emily Fink, Kevin Kissel, Michele Maxson, Katy Nichols, Steven Smith, Rachel Horowitz,Yuji Inagaki,Yuriy Fedkiw, and Erick Twaite).*

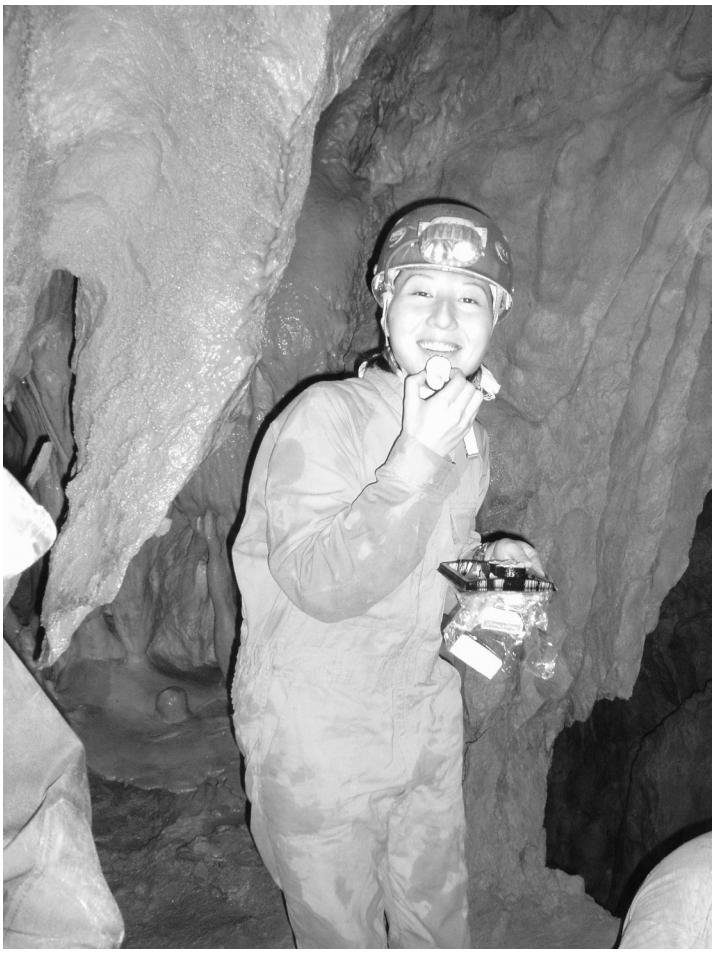


Figure 10. *Yuriko Chikano of the Japan Exploration Team enjoying a traditional Japanese snack of raw fish wrapped in rice and seaweed.*

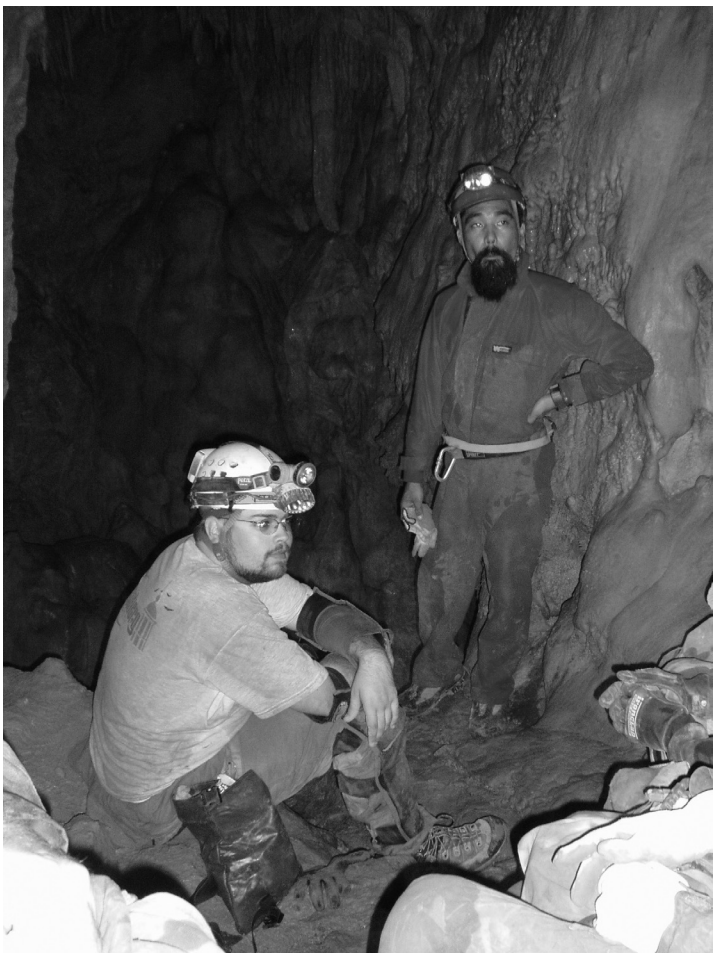


Figure 11. *Yuji Inagaki of the Japan Exploration Team (right) and Kevin Kissell taking a break in Kawachi Fuketsu Cave.*

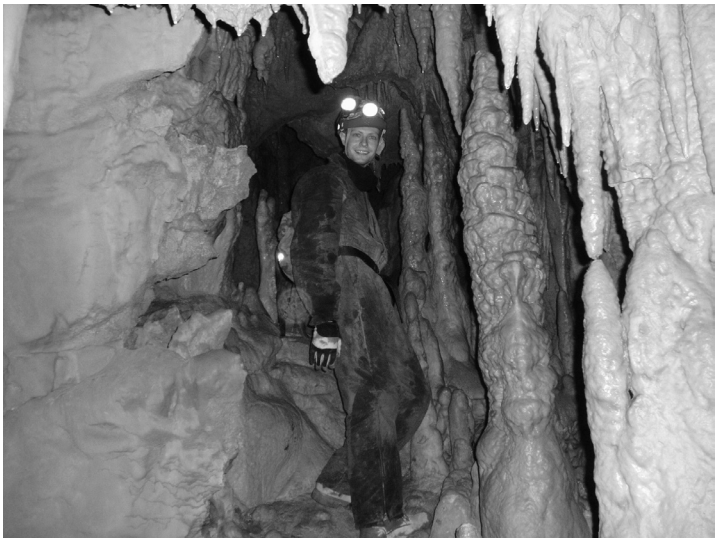


Figure 12. *Yuriy Fedkiw in speleothem-covered passage in Kawachi Fuketsu Cave.*

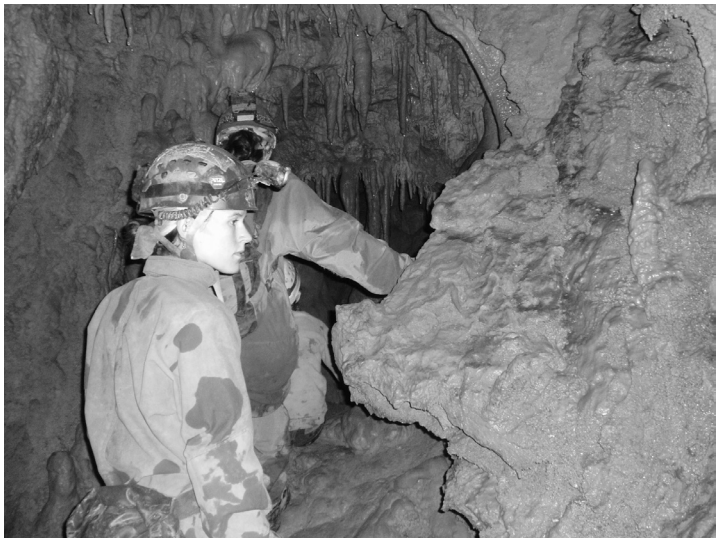


Figure 13. *Michele Maxson viewing speleothems in Kawachi Fuketsu Cave.*

was reached by a tram and the cave, though small, had many speleothems but was heavily affected by the growth of algae, mosses, and ferns resulting from the continuous use of various lights throughout, a problem noted in every tourist cave that the group visited during our trip. At one point a statue of Fudo-Sama was carved into the limestone wall (Figure 14); this was a fierce demon that was transformed into the defender of the righteous, an interesting shrine within the cave. After exiting we had lunch by capturing noodles floating down a trough of flowing water that was shared by all tourists – not a sanitary way of eating!!

As in the previous cave, we took a self-guided tour through Miyama Shonyudo Cave which had many steps carved into the limestone as well as was developed with much vertical relief. Bats were in flight in one area and the use of colored lights to highlight various features was noted throughout the passages visited, resulting in abundant lampenflora (Figure 15).

After an enjoyable time underground and after many photos, the group headed to Gujo, the geographical center of Japan. A tiring hike up Mt. Hachiman brought us to the Castle Gujo Hachiman where we had grand views of the valley and the town of Gujo (Figure 16). Later that evening, after relaxing in the baths and experiencing a classic, multi-course Japanese dinner, we went into town wearing the robes in which we had dined, and some students participated in a festive dance associated with the Festival of the Dead. With the band in the center, several rows of dancers circled clockwise around the band that was singing and chanting. After returning to the hotel, we experienced a "Ryokan" where the males and females, in different rooms, slept together comfortably on the floor.

On Tuesday, 09 August, we left Gujo, met several Japanese cavers, and proceeded to Hebi Ana Cave (Snake Cave), a limestone cave that had been modified previously (even one vertical entrance was filled completely with cement!) for tourists but no longer was open to the public. Historically, this had been used some 6,000 years ago as a human habitation site and

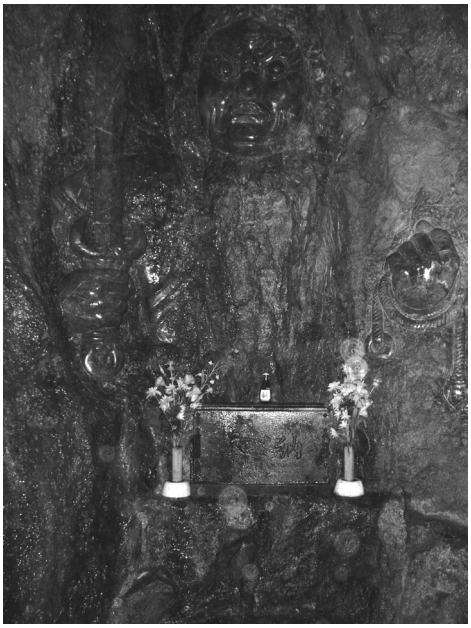


Figure 14. *Statue of Fudo-Sama in Otaki Shonyudo Cave.*

Figure 15. *Extensive lampenflora in Miyama Shonyudo Cave.*

the rocks were black due to soot from campfires, making it easier to see some of the diverse fauna known from the cave (Figure 17). Kenji Takeuchi (Figure 18), one of the Japanese cavers with us, had played a major role in the original exploration of the next cave we visited, well decorated Ryugashido Cave (Figure 19). He assisted in getting the cave open for tourists to visit and obviously still was a popular individual with the locals. The WUSSes particularly enjoyed a diversion to try out the Cave Training Center that was situated above the entrance and parking area for the cave. After some torturous squeezes and odd bodily contortions the group departed for Hamamatsu. Dinner was a welcome change from the traditional Japanese food – we ate pizza!

Figure 16. *View of the town of Gujo from the top of Castle Gujo Hachiman.*

Wednesday, 10 August, was another beautiful day and we drove to The Limestone Cave at the Temple of Gansuiji where we learned that 32 years ago a typhoon halted the process of commercializing the cave. It was a short cave with interesting fauna, including a gecarcinid crab (Figure 20) and an undescribed stygobitic isopod. The next cave visited was Takisawa Shonyu-Do Cave and was challenging due to the amount of tacky mud as well as vertically exposed sections (Figure 21). Sections of the cave had been improved and evidently were shown historically to the public. This cave had a good terrestrial fauna and was on grade school property, students of which occasionally ventured into it. By mid afternoon we departed the cave as well as the Japanese cavers. It had been a great interaction with these speleologists and we wished that we could have continued caving with them. We headed east and at dusk as we approached Fujikawaguchiko-Machi the clouds lifted and in the twilight we had our first view of Mt. Fuji. After checking into the hotel we had an excellent four course French meal. After breakfast on Thursday, 11 August, we loaded our caving gear on to the bus and drove to the flanks of a cloud-covered Mt. Fuji. Approximately 65 caves (lava tubes) are associated with the mountain and we visited four of them during the

Figure 17. *Chordeumatid millipedes from Hebi Ana Cave (Snake Cave).*

Figure 18. *Kenji Takeuchi standing in front of photographs of early exploration in Ryugashido Cave.*

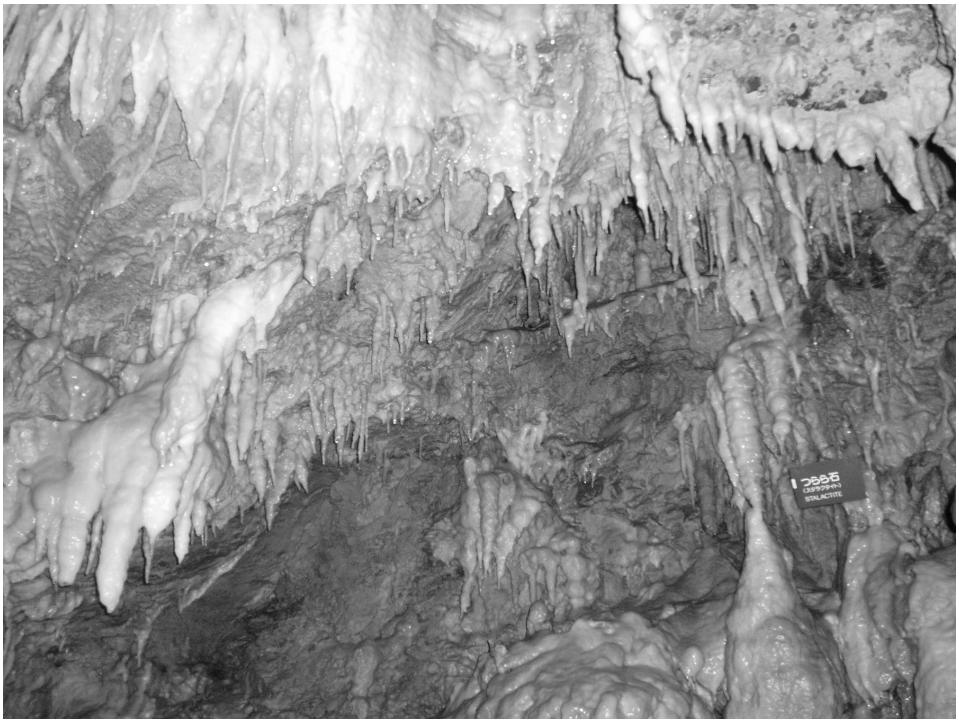


Figure 19. *Speleothems in Ryugashido Cave.*

Figure 20. *A gecarcinid land crab in The Limestone Cave at the Temple of Gansuiji.*

day. The first two were show caves with many tourists and were ice caves, having permanent ice in the lower sections: Fugaku Lava Cave (=Mt. Fuji Wind Cave - Figure 22) and Narusawa Icicle Lava Cave (Figure 23). We met Yuryi, had lunch, and then proceeded to Mt Fuji Lava Ice Cave, a non-commercial cave that maintained temperatures below freezing. Ice in one section of the cave was 10m deep and the entrance was at 1159m (3800 feet) elevation on the slopes of Mt. Fuji. Students really enjoyed seeing this cave since this was the first lava tube that they had been able to enter without the constraints of commercialization (Figure 24). Beautiful ice formations went along with the fun of sliding around on the ice (Figures 25, 26.)! The last cave visited was Shoiko #1 Cave further up the mountain. It was a much warmer cave that did not support the development of ice but, nevertheless, was interesting with very black, light-absorbing lava passages (Figure 27). Cinders covered the floor of the passages and were very sharp, providing a real obstacle to crawling. Although the realization that this was the last cave that we would enter on the trip, the group remained

Figure 21. *WUSSes climbing carefully in Takisawa Syounyuudou Cave.*

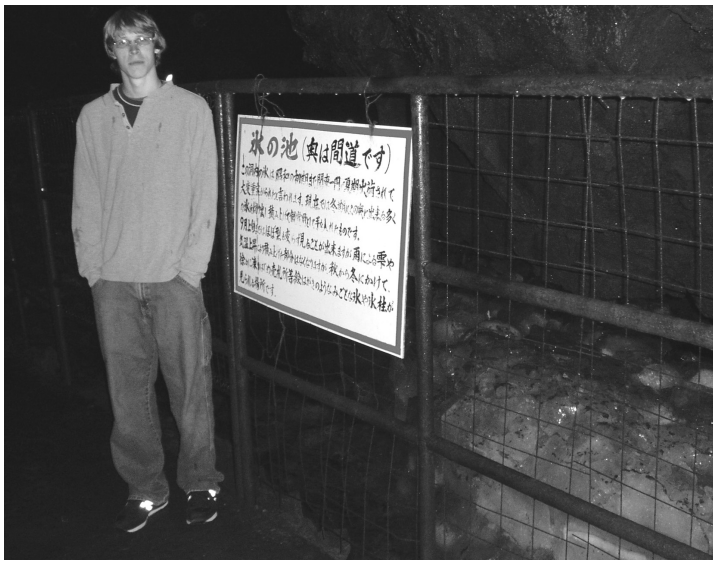


Figure 22. *Erick Twaite observing melting ice in Fugaku Lava Cave.*

Figure 23. *Long lines of tourists at Narusawa Icicle Lava Cave.*

Figure 24. *Entrance to Mt. Fuji Lava Ice Cave.*

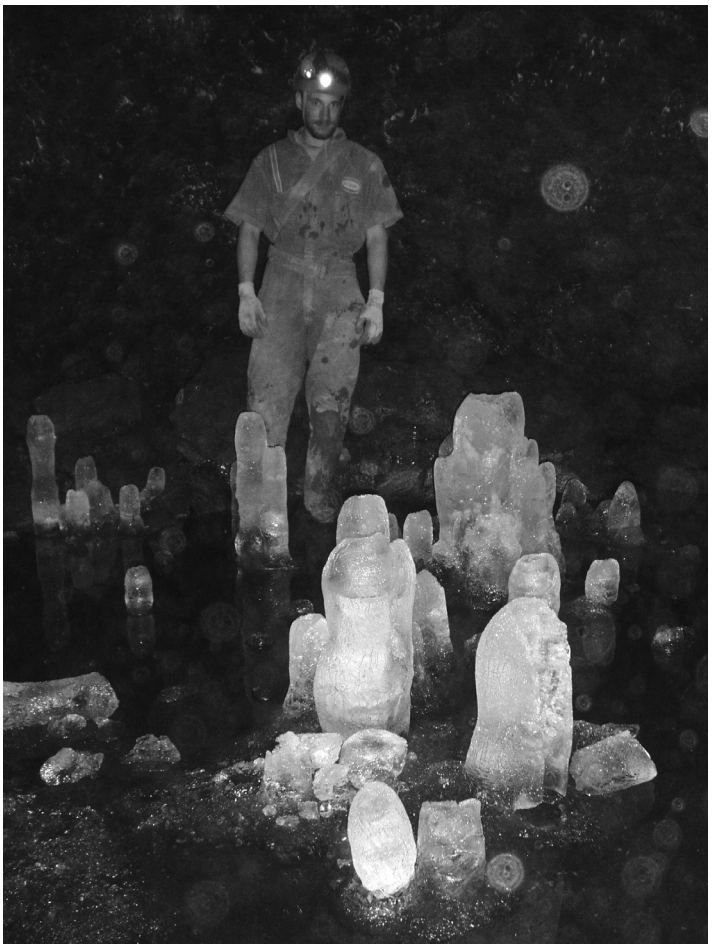


Figure 25. *Caleb Heimlich standing by large ice stalagmites in Mt. Fuji Lava Ice Cave.*

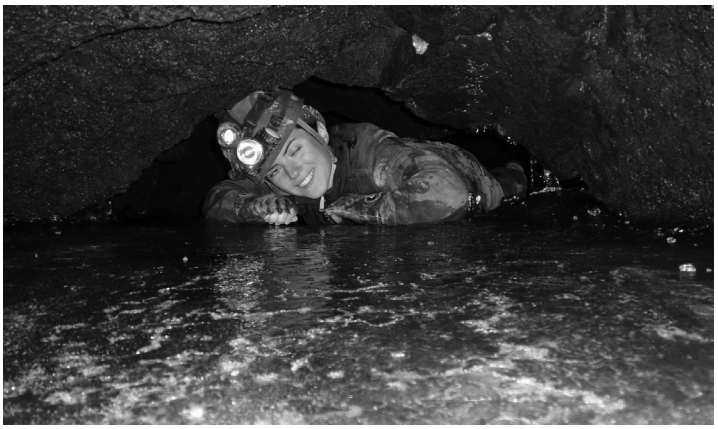


Figure 26. *Rachel Horowitz sliding on ice through low section in Mt. Fuji Lava Ice Cave.*

Figure 27. *Black lavacicle in Shoiko #1 Cave.*

excited as they anticipated climbing on Mt. Fuji in the morning.

We arose from little sleep before 3AM and rode the bus to the 5th Station. Clouds were thick and rain was falling. As we climbed, the wind continued to increase and by 6AM when we reached the 7th Station at approximately 8800 feet elevation the wind was whipping the rain into our faces and the cool temperatures were a sobering fact (Figure 28). Unfortunately we did not have time scheduled to make an attempt for the summit and headed back down. By noon we were leaving for Tokyo and just before 2PM we arrived at our final hotel. A good meal was followed by a subway trip to the Shinjuku part of the city where we walked around the area in a light rain.

Figure 28. *Wet and cold WUSSes on the flanks of Mt. Fuji.*

The last full day in Japan was spent making a loop around the massive city of Tokyo. We met Jeff Huffman, a Wittenberg graduate of seven years ago, and Yuryi in the northeast end of the city and shopped, visited a temple, walked through the Korean section, and took a boat ride down the Sumida River (Figure 29) past 12 bridges where we spent some time in the beautiful Hama-rikyu Gardens (Figure 30). We left the southeastern part of the city and caught a subway to the southwestern section where we ran into huge crowds and a parade. A good meal ended the final day in Japan.

The trip home was somewhat rushed to make flight connections in Chicago which turned into a delay and when we reached Dayton, no one was there to return us to the university. A few phone calls and families came to the rescue and all made it back safely.

Jet lag exacerbated by crossing the International Date Line aside, the trip to Japan was even better than we anticipated. Although the trip was altered somewhat from the original plans, the result was a terrific journey that mixed cultural experiences along with caving. Friends were made and it is our hope that we can encourage some of them to come for a visit and to cave with us in the United States.

Figure 29. *Boat ride on the Sumida River in Tokyo.*

Acknowledgments

Steven Smith was a tremendous resource of information and all appreciated his efforts both prior to the trip as well as during the travels. His knowledge of the language, history, and culture of the country are extraordinary. Without him this would have been a very different trip and one that would have been far less rewarding for us.

Figure 30. *Hama-rikyu Gardens in Tokyo.*

Yuryi Fedkiw deserves an immense thank you. He carried the heavy burden of contacting Japanese cavers and organizing most of the cave visitations and we truly enjoyed visiting and caving with him. Yuriko Chikano, Yuji Inagaki, Kenji Takeuchi, and other Japanese cavers were incredibly helpful and enjoyable to cave with and are encouraged to come to the U. S. for a visit. Appreciation is extended to Jeff Huffman who spent one day with us as we toured various sites in Tokyo.

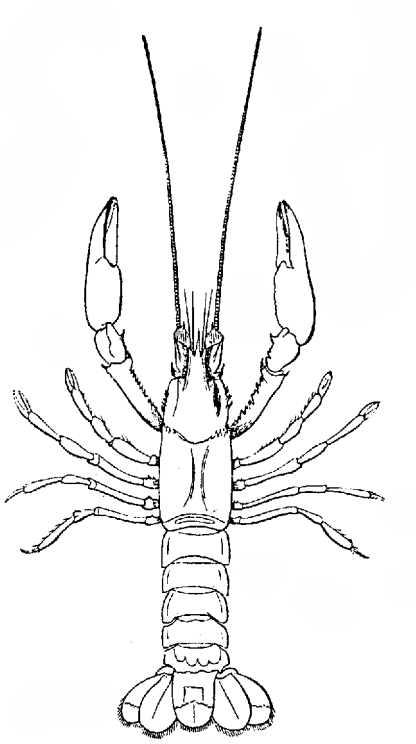
The ten of us from Wittenberg extend our gratitude to the Freeman committee for selecting WUSS to be a recipient of the grant to provide the opportunity for travel in Asia. It was an incredible experience for all and one that we look forward to sharing with others in the Wittenberg and Springfield communities.

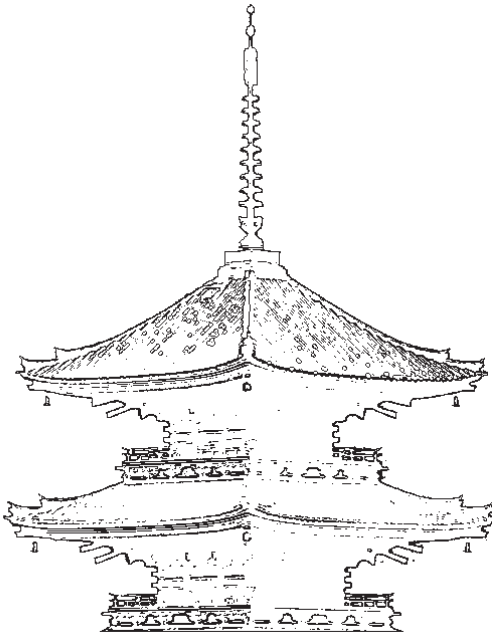
Literature Cited

Courbon, Paul, Claude Chabert, Peter Bosted, and Karen Lindsley. 1989. Atlas of the great caves of the world. Cave Books, St. Louis, 368pp.

Middleton, John and Tony Waltham. 1986. The Underground Atlas. A gazetteer of the world's cave regions. Bookmark Limited, Leiscester, 239pp.

Yummy caramel in Sloan's Valley Cave, Kentucky.





Reflections on Japan: A Fantastic Story

Emmy Fink (WUSS #0534, NSS #56975)

"I had never imagined that my college experience would include a trip to Japan."

In August of 2005, however, I made an unforgettable journey with WUSS that started in Osaka and ended 12 days later in Tokyo. When I told my friends and family that I would be traveling to Japan for "spelunking," I was asked many questions that I could not answer: Were there caves in Japan? What were we planning to do in them? How would I, who only knew three Japanese words (which I admit came from pop music) survive nearly two weeks in Japan? The realization of my lack of knowledge was terrifying. I can only assume that I was not alone.

Even though we were there for the purpose of exploring caves, I think that we learned more from the culture that surrounded us. Some things I learned in Japan:

- Ice cream is delicious and wonderful in any culture. (Especially on the scorching days when we were trekking across cities.)
- Japanese children are polite and friendly, especially when they have the aforementioned ice cream.
- Seeing a geisha is actually rare, but somehow we saw
- Tea can be served at any time of the day, at any temperature, with any entrée.
- If you don't know how to dance at a festival, just jump in. You'll learn how despite the language barrier.
- An empty glass is an insult.
- The art of using chopsticks is one that can be acquired in only a few days.
- Coca-Cola does not taste the same everywhere, but is still refreshing.
- Even the Mighty Ducks 2 will make you think fondly of home.
- Jet lag takes a long time to subside. Eventually you just go without sleep.

We played Disney on Ice in a lave tube, climbed a few stations at Fuji, and caught up with Yuriy who had plenty of stories to share. We rode subways, buses, planes and walked around a new and strange world. We stayed in a traditional inn and ate French dinners. We participated in mutiny that resulted in a night of pizza after endless noodles. We took off our shoes in museums and shrines and took thousands of pictures. We danced in a festival in a traditional style of dress. We traveled to Japan and took a journey we will never forget.

Adaptations and evolution of the cave fish family *Amblyopsidae*

Courtney Dancer, WUSS # 0547

Abstract

Thousands of cave-limited species are known, and there are estimated to be between 50,000 and 100,000 obligate cave-dwelling species. The majority of cave dwellers are blind and lack pigments and, via convergent or parallel evolution eventually evolved forms that are extremely different from the pleisiomorphic traits demonstrated by their surface ancestors. Regressive evolution describes the development of reduced pigments and degenerate eyes of cave-dwelling organisms. Surface ancestors had eyes and pigments, but these traits were energetically costly to the fish restricted to life within a cave. Cave fish are examples of species that have adapted and evolved over time for life in caves. One specific family of cave fish is Amblyopsidae, which is found in the southern and eastern United States. *Chologaster cornuta* is an epigean amblyopsid and is considered to be preadapted for cave life. *Forbesichthys agassizi* is found in both surface and cave streams, and is therefore a facultative stygophile. *F. agassizi* possesses reduced eyes but is capable of detecting changes in light intensities. *Typhlichthys subterraneus*, *Amblyopsis spelaea*, *Amblyopsis rosae*, and *Speoplatyrhinus poulsoni* are the four obligate species (stygobionts). *A. spelaea* is the first cavernicolous fish discovered and was described by DeKay in 1842. The eyes are not functional and are underneath the skin, and *A. spelaea* has sensory papillae on the longitudinal rows on the caudal fin. *Typhlichthys subterraneus*, *Amblyopsis rosae,* and *Speoplatyrhinus poulsoni* resemble *A. spelaea* and also possess degenerate eyes. *S. poulsoni* is the rarest species, known to be endemic to only one cave in Alabama, and is the most highly cave adapted. By comparing *T. subterraneus*, *A. spelaea*, *A. rosae*, and *S. poulsoni* to their epigean relatives, *C. cornuta* and *F. agassizi*, it is apparent that increased isolation in caves leads to adaptive and evolutionary traits for survival.

Today tens of thousands of cave-dwelling species are recognized, and there are estimated to be 50,000 and 100,000 obligate (cave-limited) species globally and approximately 1000 species in the contiguous United States (Culver et al. 2000, Culver et al. 2003). The majority of these restricted cave dwellers are blind and lack pigments and many cave-limited organisms are endemic species- they have restricted geographic ranges and are found only in a limited number of caves [211 (45%) species of obligate terrestrial cave-dwelling animals (troglobionts) in the eastern United States are single cave endemics– Christman et al. 2005]. Cave organisms are stygomorphs, or "forms where the body is clearly modified for cave existence and which are quite different from all normal noncavernicolous animals." Cave animals have many common traits even when they belong to different taxonomic groups. These members show convergent evolution and eventually evolved forms that are extremely different from their pleisiomorphic surface ancestors (Culver et al. 1995). Stygobionts show an extensive set of morphological, physiological, and behavioral characteristics that are shared (Trajano 2001). As a result of the loss of eyes, pigments, and certain systems within the body, cave organisms elaborate other characters, like sensory and tactile organs. These adaptations are apomorphic traits that are a necessity for survival in a stygobitic lifestyle (Culver et al. 1995).

Regressive evolution describes the development of reduced pigments and degenerate eyes of cave-dwelling organisms. Surface ancestors had eyes and pigments, but these traits were unnecessary for survival in a cave and, in fact, were energetically costly in this energy restricted environment. Traits that are associated with obligate cave organisms are generally classified as regressive yet are progressive because they are characteristics that organisms have developed to survive a hypogean lifestyle. The theory of natural selection can be used to explain the survival of animals with a character, such as increased sensory organs, that is an advantage in their habitat (Moore and Sullivan 1997). Obligate amblyopsids developed a remarkably acute lateral line system in replace of eyes that were energetically expensive in a food-poor, completely dark habitat. The most genetically fit species survive in nature because they have traits that allow them to survive and reproduce when their environment changes, either subtly or drastically.

Another explanation is genetic mutation or the "abrupt, random changes in genes." Following the initial colonization of a cave by a species adapted to a surface environment, a genetic separation from the epigean population is required for evolution (Moore and Sullivan 1997). Adaptation requires genetic variation in fitness that results from selective pressure (Culver 1982). The cave environment acts as a selective pressure because of its unique characteristics, such as complete darkness and limited food sources. Stygobiotic organisms must be very well adapted to survive in this type of habitat.

Cave fish are examples of species that have adapted and evolved over time for life in caves. They are rarely more than ten centimeters in length, but have no known predators on the adults. Cave fish are the top predators in caves, and they feed on copepods, isopods, amphipods, and small crayfishes, but may sometimes be cannibalistic as well (Moore and Sullivan 1997). One specific family of cave fishes is Amblyopsidae, which are found in the southern and eastern United States (Romero and Poulson 2001). The Amblyopsidae consists of several genera and are derived from the genus *Chologaster* (Vandel 1965; Bechler 1983). *Chologaster cornuta* is an epigean form of amblyopsids inhabiting swamps of the southern Atlantic coastal plain from Virginia to Georgia (Figure 1A). It is pigmented with a dark dorsal surface and sides, and a paler ventral surface (Vandel 1965). There is a horizontal stripe on the side of its body, the fins are pigmented, and it possesses small, functional eyes (Woods and Unger 1957; Vandel 1965; Bechler 1983).

C. cornuta is considered to be preadapted for cave life. *Forbesichthys agassizi* is found in surface swamps, springs, and cave streams in northcentral Tennessee, and from southern Illinois to central Kentucky, and is a stygophile (Poly and Proudlove. 2004). It is pale pink in color with the lateral pigmented band absent (Figure 1B). *F. agassizi*

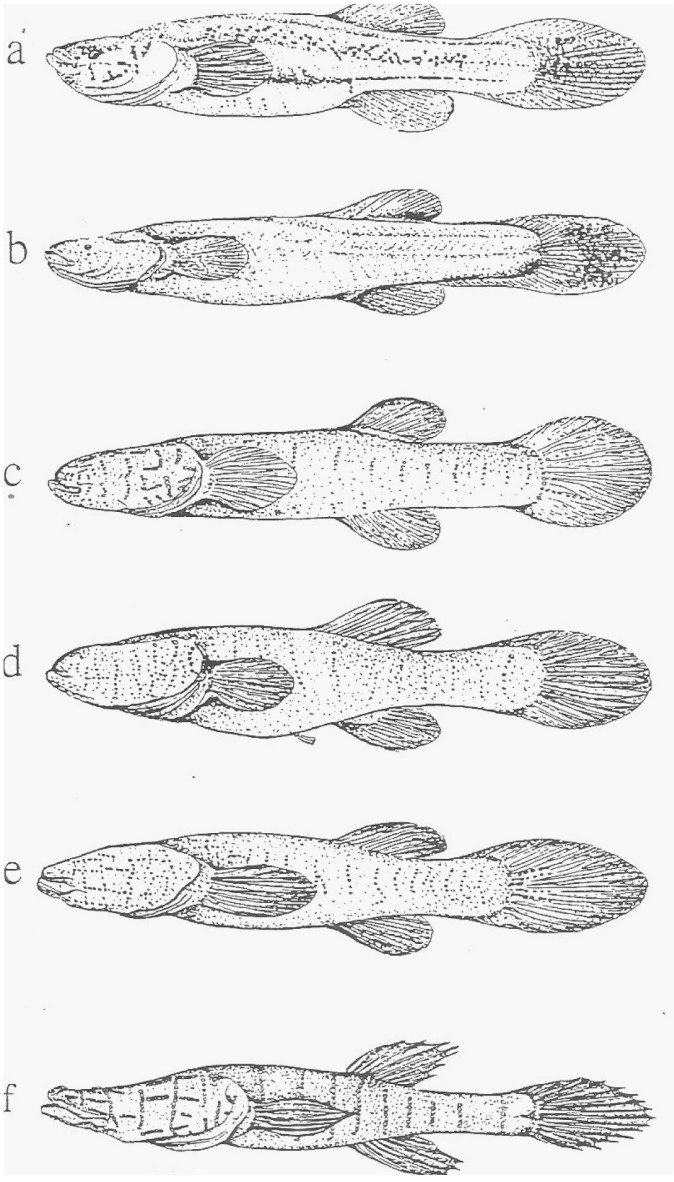


Figure 1. The representatives of the family *Amblyopsidae.* A, *Chologaster cornuta;* B, *Forbesichthys agassizi;* C, *Typhlichthys subterraneus,* D, *Amblyopsis spelaea;* E, *Amblyopsis rosae;* F, *Speoplatyrhinus poulsoni* (after Woods and Inger. Vandel 1965).

possesses reduced eyes but is capable of detecting changes in light intensities (Bechler 1983).

Typhlichthys subterraneus ranges in karst areas from northeast Oklahoma through southern Missouri and northern Arkansas to central Kentucky, Tennessee, and northern Alabama. It has rudimentary eyes that are hidden under the skin, and a depigmented body (Figure 1C). *Amblyopsis spelaea* is the first cavernicolous fish discovered and it was described by DeKay in 1842 (Figure 1D), and occurs in ground waters from southern Indiana to central Kentucky. It is slightly pink because of the color of its blood. The eyes are not functional and are underneath the skin (Vandel 1965), and *A. spelaea* has sensory papillae on the longitudinal rows on the caudal fin (Figure 1D). *Amblyopsis rosae* resembles *A. spelaea* and also possesses degenerate eyes (Figure 1E), and is restricted to caves in northwestern Arkansas, northeastern Oklahoma, and southwestern Missouri. *Speoplatyrhinus poulsoni* is unique among the amblyopsids, is a single-site endemic species in northern Alabama, and is the most highly cave-adapted stygobiont. It possesses an elongated body, with a depressed and elongated head (Figure 1F). The lower jaw projects slightly, the tip of the snout is rounded, dorsoventrally flattened, and constricted laterally, which gives the anterior portion of the head a bill-like appearance (Romero 1998). As in the other stygobitic amblyopsids, *S. poulsoni* does not have functional eyes or a pigmented body (Figure 1F) (Romero 1998).

T. subterraneus, *A. speleae*, *A. rosae*, and *S. poulsoni* are K-strategists in that they show some form of all of the following characteristics: delayed reproduction, increased longevity, smaller total number of eggs produced, larger egg size, reduced metabolic rate, and behavioral traits (Culver 1982; Poulson 1963). In comparison to *C. cornuta* (epigean) and *F. agassizi* (stygophile), the stygobiotic amblyopsids are considerably more adapted and evolved for permanent cave life.

As juveniles, the eyes of *A. spelaea* and *A. rosae* are more "developed," and appear on the surface of the body. Once the young mature to adults, the eye disappears, the skin thickens and covers it and it migrates from the surface towards the brain (Vandel 1965). Functional eyes or sight are not needed because there is no light within caves, and are likely energetically expensive structures to maintain in a food-poor environment. As compensation and adaptation to the loss of functional eyes, *T. subterraneus*, *A. spelaea*, *A. rosae*, and *S. poulsoni* have well-developed sensory systems (Figure 2) (Culver

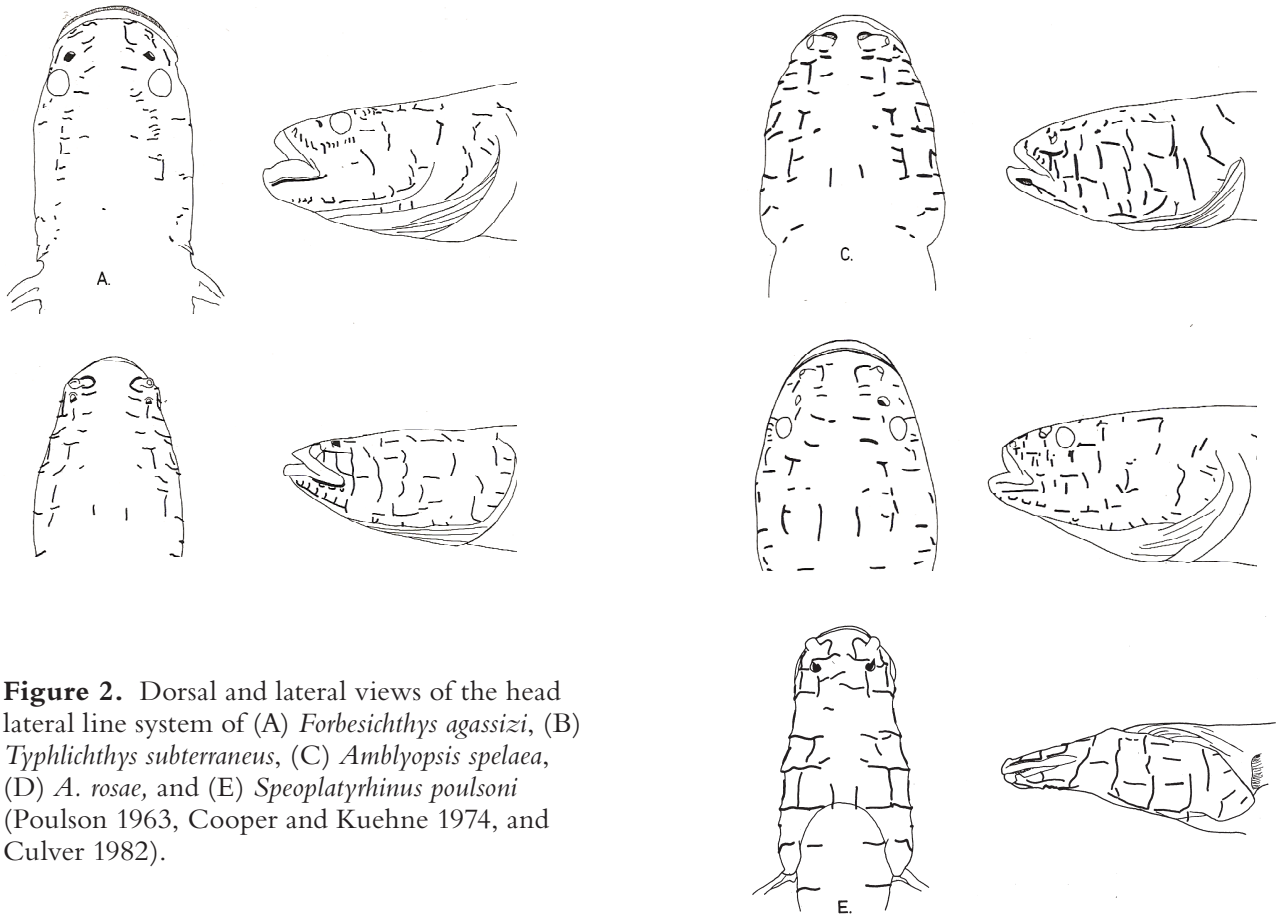


Figure 2. Dorsal and lateral views of the head lateral line system of (A) *Forbesichthys agassizi*, (B) *Typhlichthys subterraneus*, (C) *Amblyopsis spelaea*, (D) *A. rosae,* and (E) *Speoplatyrhinus poulsoni* (Poulson 1963, Cooper and Kuehne 1974, and Culver 1982).

1982). Sensory neuromasts are present on the caudal fin and along the length of the body (Vandel 1965). These neuromasts are part of the lateral line system that runs along the head and body (Figure 2). This increases food-finding ability at low prey densities but provides no aid when food densities are high, probably resulting from the low maximum food intake of cave fish (Culver 1982). The surface relative, *Chologaster cornuta*, do not have as well developed sensory organs because it is not a cavernicole, and light and abundant food are present. When compared, *A. spelaea* can locate prey faster than *F. agassizi* when the number of prey is low, but the reverse is true when prey densities are high (Culver 1982). The lateral line system of *S. poulsoni* is greatly hypertrophied, with an extensive system of free neuromasts arranged in visible ridges on the head and body (Romero 1998). The sensory papillae on the caudal fin are highly developed, fewer, and larger than in any of the other amblyopsids (Romero 1998).

A. spelaea and *A. rosae* are able to detect and avoid obstacles. Both fish are more hesitant when approaching unknown barriers, and turn away at 13 mm. *F. agassizi*, on the other hand, approaches unknown barriers, turns slightly at about 2.7 mm, and stops or darts away (Poulson 1963).

A. spelaea and *A. rosae* are able to detect obstacles easier because their brains have undergone adaptive changes. The optic lobe is smaller in size, but their overall central nervous system is better, which increases their ability to detect both obstacles and food (Poulson 1963; Culver 1982).

During evolution there has been selection of hunting ability because of scarcity of food in a cave environment. Seasonal flooding and infiltration of groundwater are the sources of seasonal variations in cave habitats (Poulson 1963). Floods bring in the majority of the organic matter utilized by cave organisms. Obligate cave fish have adapted to this lack of food by metabolic efficiency and reduced metabolic rate (Poulson 2001; Culver 1982). *C. cornuta* has the highest metabolic rate, which is due to an abundance of food available in surface streams (Poulson 1963). *A. spelaea* and *A. rosae* have the lowest metabolic rates. Low metabolic rates allow amblyopsid fishes to survive long periods of time without eating, and to have a low maximum food intake.

Gill surface area also may contribute to reduced metabolic rates of *A. spelaea* and *A. rosae*. The total gill surface area decreases from surface-dwelling, to facultative, to obligate species of amblyopsid fishes with decreasing whole animal metabolic rate. *C. cornuta* has long gill filaments with a high total number of lamellae. It has the highest gill respiratory area, which correlates to its having the highest metabolic rate. *A. rosae* has the lowest traits contributing to gill surface area. It has the lowest total respiratory rate which fits with its having the lowest metabolic rate. *A. spelaea* has a much lower gill area and metabolic rate but swims constantly (Poulson 2001).

Seasonal flooding not only brings in an abundance of food, but it also triggers the reproductive cycle of cavernicolous fish (Vandel 1965). *A. spelaea* and *A. rosae* begin to reproduce when floods occur as a result of the major input of food. Both the endocrine and reproductive glands are stimulated (Vandal 1965). *A. spelaea* demonstrates a defined yearly cycle in which ova mature in the fall, and breeding occurs from February to April during high water (Poulson 1963).

With increasing cave adaptation the number of offspring produced decreases, while the size of the ova increases (Poulson 1963). Longevity and age at first reproduction increase with increasing adaptation to caves (Figure 3). Both *C. cornuta* and *F. agassizi* breed at age zero, while *A. spelaea* and *A. rosae* breed at a much older age (Figure 3) (Poulson 1963).

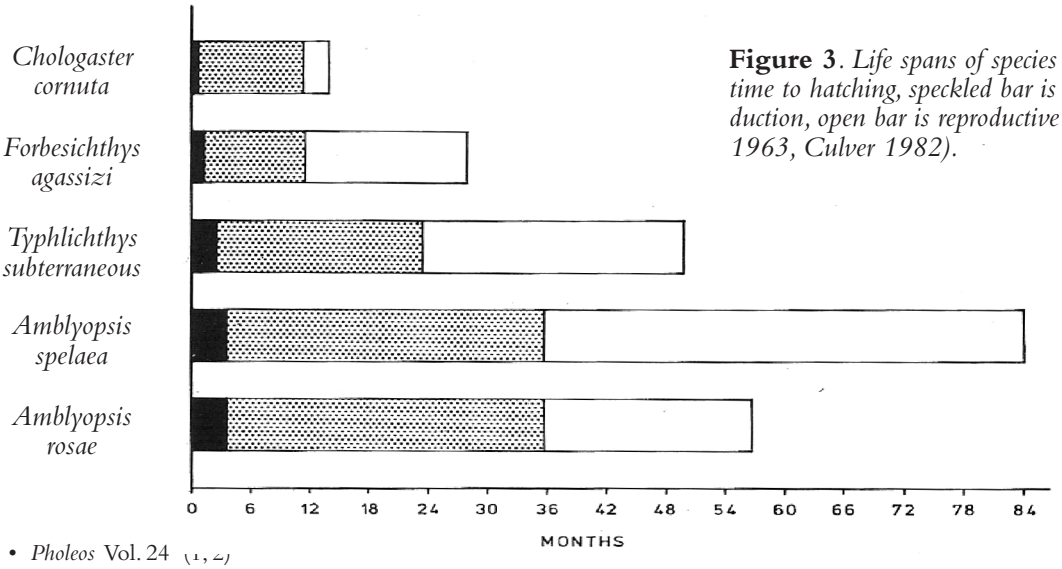


Figure 3. *Life spans of species of amblyopsid fish. Black bar is time to hatching, speckled bar is time from hatching to first reproduction, open bar is reproductive life span (modified from Poulson 1963, Culver 1982).*

All four obligate species of Amblyopsidae produce small numbers of eggs (70-100) that are very large (much yolk). The eggs are carried in the gill cavity of the females until hatching, and remain in the cavity until the young lose their yolk sac, a period of 4-5 months. This decreases the mortality rate because the offspring are larger and more developed, enabling them to cope with floods and to capture food (Poulson 1963).

A. spelaea and *A. rosae* also have developed delayed sexual maturity compared to *C. cornuta* and *F. agassizi*; they are sexually mature at 3-4 years old (Culver 1982; Vandel 1965). The most likely selective factor is density-dependent adult fecundity, but long periods of population decline may result in selection for delayed reproduction as well. Only 10% of *A. spelaea* and *A. rosae* that are reproductively mature reproduce in one year. A significant proportion of the population does not reproduce, which indicates that the environment is so food poor that many individuals never reproduce, and selection is potentially strong (Culver 1982). Fewer, larger offspring are produced, especially during periods of food limitation.

The lack of food within the hypogean environment results in intraspecific competition within amblyopsid fishes. Competition results in agonistic behavior, and is important in the defense of food. Amblyopsidae exhibit both aggressive and submissive acts. *C. cornuta* does not exhibit any agonistic behavior, probably due to its living in surface streams, and the availability of food. Tail-beating occurs when an individual undulates its body laterally, causing a whip-like motion of the tail. *F. agassizi* tail-beats under rocks, while *Amblyopsis* spp. tail-beat as they swim. This is the most frequent action exhibited by amblyopsids and probably serves to propel water at an opponent. Biting occurs when two individuals are in close proximity. Physical injury occurs, such as bruises on the body or pieces of fins bitten off. Injuries are common in *A. spelaea*, but are not as frequent for *F. agassizi*; *A. rosae* does not bite (Bechler 1983).

Submissive acts are exhibited by amblyopsid fishes. Freezing takes place when a fish becomes completely motionless. The fish allows itself to drift upwards or downwards, resulting in its being carried away from its opponent. All cave amblyopsids exhibit freezing. A second type of submissive act is escape, which is the act of one fish fleeing the area of another. All of the cave species engage in escape behavior (Bechler 1983).

Caves are selective environments in which stygobionts must adapt and evolve in order to survive. K-strategists show some form of or all of the following characteristics: delayed reproduction, increased longevity, smaller total number of eggs produced, larger egg size, reduced metabolic rate, and various behavioral traits. They also lack eyes and pigments since there is little to no light, and are energy-costing to produce and maintain. By comparing *Typhlichthys subterraneus*, *Amblyopsis spelaea*, *Amblyopsis rosae*, and *Speoplatyrhinus poulsoni* with their epigean relative, *Chologaster cornuta*, and stygophilic relative, *Forbesichthys agassizi*, it is apparent that increased isolation in caves leads to adaptive and evolutionary traits for the survival of the species.

Acknowledgments

I would like to thank Dr. Horton Hobbs III for all of his encouragement, patience, and advice while composing this paper.

Literature Cited

Bechler, D. L. 1983. The Evolution of Agonistic Behavior in Amblyopsid Fishes. Behavioral Ecology and Sociobiology, 12: 35-42.

Christman, Mary C., David C.Culver, Molly K. Madden, and Denis White. 2005. Patterns of endemism of the eastern North American cave fauna. Journal of Biogeography, 32:1441-1452.

Cooper, J. E. and R. A. Kuehne. 1974. *Speoplatyrhinus poulsoni*, a new genus and species of subterranean fish from Alabama. Copeia, 1974:486-493.

Culver, D. C. 1982. Cave Life: Evolution and Ecology. Harvard University Press, MA, 189pp.

Culver, David C., Mary C. Christman, William R. Elliott, Horton H. Hobbs III, and James R. Reddell. 2003. The North American obligate cave fauna: regional patterns. Biodiversity and Conservation, 12(3): 441-468.

Culver, D. C., T. C. Kane, and D.W. Fong. 1995. Adaptation and Natural Selection in Caves: The Evolution of *Gammarus minus*. Harvard University Press, MA, 223pp.

Moore, G. and N. Sullivan. 1997. Speleology: Caves and the Cave Environment. Cave Books, MO, 176pp.

Poly, W. J. and G. S. Proudlove. 2004. Annotated checklist of fishes. California Academy of Sciences, No. 25: 1-7.

RESEARCH

Poulson, T. L. 1963. Cave adaptation in amblyopsid fishes. American Midland Naturalist, 70(2): 257-290.

Poulson, T. L. 2001. Morphological and physiological correlates of evolutionary reduction of metabolic rate among amblyopsid cave fishes. Environmental Biology of Fishes, 62: 239-249.

Romero, A. 1998. Threatened fishes of the world: *Speoplatyrhinus poulsoni* Cooper & Kuehne, 1974 (Amblyopsidae). Environmental Biology of Fishes, 53: 293-294.

Romero, A. and D. M. Poulson. 2001. It's a wonderful hypogean life: a guide to the troglomorphic fishes of the world. Environmental Biology of Fishes, 62: 13-41.

Trajano, E. 2001. Ecology of subterranean fishes: an overview. Environmental Biology of Fishes, 62: 133-160.

Vandel, A. 1965. Biospeleology. Pergamon Press, Oxford, 524pp.

Woods, P. and R. F. Unger. 1957. The cave, spring, and swamp fishes of the family Amblyopsidae of central and eastern United States. American Midland Naturalist, 58 (1): 232-256.

MOVIE REVIEW

The Cave: Do you Dare?!

Katy Nichols (WUSS #0533)

The excitement! The romance!
The danger! The Cave!

This past year, director Bruce Hunt took the human race on a tantalizing adventure into a cave that lies beneath the bowels of hell. For real. Satan signed off on it and all.

So here is a synopsis:

Slavic dude: "Oh look! A cave under zis church!"

28 other Slavic dudes: "Oh no! We have fallen in!"

Millions of years later . . .

Hot blonde: "Oh look! I am in my bathing suit!"

Captain of the team: "Oh no! I am a monster!"

The End.

As you can see, the plot was highly developed and well worth a second, nay a forty-seventh viewing. If the twists and turns of a classic thriller do not draw you in, then consider the scientific breakthrough the film also boasts. The speleological research done for this film was so intensive that they actually discovered a parasite that turns humans into giant squishy man-eating bat thingees with horrible breath and exceedingly poor social skills. Who knew? Not I, friend, not I.

The Cave is the topmost worst film of the 2005 production year and, quite possibly, of every year preceding it and all those yet to come.

Overall Rating: Awesome-ish, kinda, maybe, no.

Stalactite Pit, Carter Caves State Resort Park, Kentucky

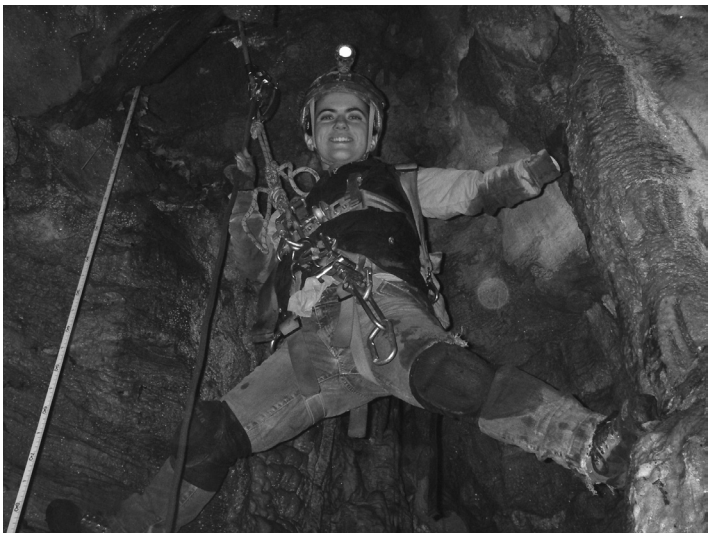
Kevin Kissell, WUSS #0530, NSS #54578
Caleb Heimlich , WUSS #0539, NSS #55745
Rachel Horowitz , WUSS #0531 NSS #56553

21 JANUARY, 2006

A fairly warm weekend in January found a group of past and present WUSSes on a trip to Carter Caves State Resort Park for some much needed survey work. Two students of Dr. Hobbs' joined him for some cave entrance location recording, while Matt Hazelton, Kristi Krumlauf, and Justin Estep surveyed small horizontal caves. As for Caleb Heimlich, Rachel Horowitz, and me the decision was made to survey pits inside the park. Two pit surveys were finished that weekend: Stalactite Pit and Mossy Pit (see accompanying article), as well as starting on the Haunted Pit survey.

The first stop on our survey trip was a pit known as Stalactite Pit which was aptly named due to the presence of stalactites just below the rim of the pit. Upon reaching the pit entrance we found a large tree trunk blocking the majority of the hole. Feeling that the tree was not stable we rigged the rope so we would have minimal contact with the tree on our descent. However as Caleb was checking the rim of the pit he placed his foot on the tree trunk at which point it dislodged from its position and fell to the bottom of the pit. This being our first pit survey, we decided the easiest way to survey the pit would be to establish a point at the rim of the pit and use the rope as a plumb bob. Using our Leica Disto laser range finders we recorded the distances from the rope to the left, right, front, and back walls. Once on the floor of the pit we surveyed it just like a horizontal passage.

A large tree trunk was blocking the entrance to Stalactite Pit. It now sits in two pieces at the bottom of the pit. Photo by K. M. Kissell



Rachel Horowitz spans the walls of Stalactite Pit on her climb out. Photo by K. M. Kissell

Upon reaching the floor we discovered that the pit was a mere 5.86 meters deep. The floor was covered in organic debris, no doubt due to the funnel-shaped, downward slope

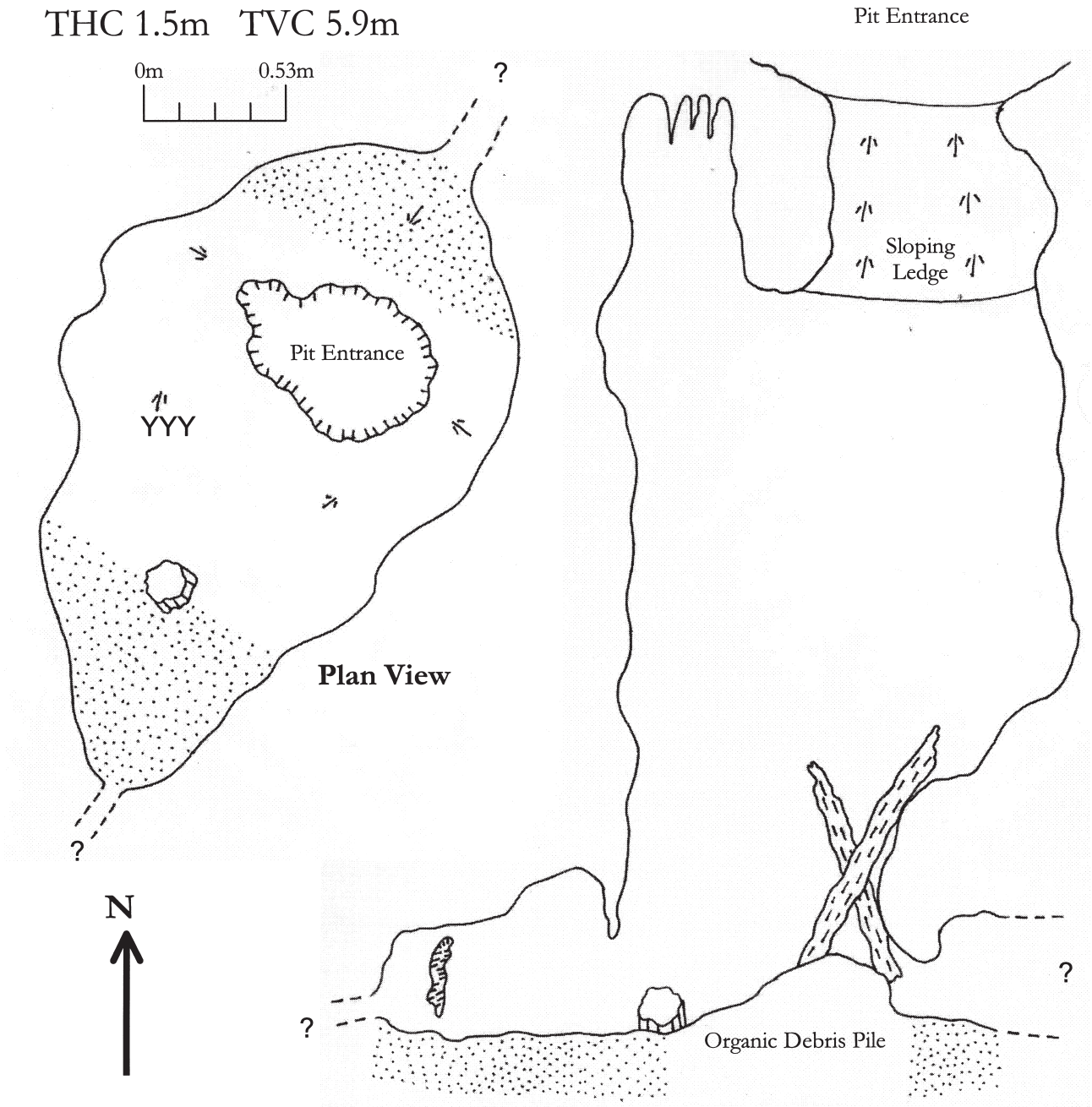
Stalactite Pit

Carter County, Kentucky

21 January 2006

Caleb Heimlich
Rachel Horowitz
Kevin Kissell

THC 1.5m TVC 5.9m



Wittenberg University Speleological Society KMK

Caleb Heimlich in "The Shelter Room" at the bottom of Stalactite Pit. Photo by K. M. Kissell

of the area surrounding the entrance hole. The entire pit seemed to form along a fissure in the limestone since the floor of the pit was very linear. On the southwest and northeast ends of the pit floor were passages that continued on for more than a meter but were too small for human travel. Numerous cave crickets representing both *Hadenoecus cumberlandicus* and *Ceuthophilus* sp. were found in the bottom of the pit.

The entire pit was about five meters tall except for one "room" that had a ceiling height of about one meter. We called this "The Shelter Room" since it was the only area that was out of the fall zone when someone was kicking debris down the hole. Upon looking up and out of the pit we realized we could free climb out without any problems; however in the back of our minds we heard Hobbs' voice tell us not to due to safety concerns. We opted instead to climb out on our two safeties only.

Mossy Pit, Carter Caves State Resort Park, Kentucky

Kevin Kissell, WUSS #0530, NSS #54578
Caleb Heimlich , WUSS #0539, NSS #55745
Rachel Horowitz , WUSS #0531 NSS #56553

21 JANUARY, 2006

After successfully completing our first survey of a pit Caleb, Rachel, and I set out for yet another pit not far away. Mossy Pit is located a few hundred meters due east of Stalactite Pit, the most distinctive feature of the entire pit is the entrance. From the surface the pit appears to have two small entrances roughly one meter apart from each other. However when you descend below the lip of the pit you notice that the pit has one elongated entrance which is separated by a rather large piece of limestone, which has effectively split the main entrance of the pit into two small holes each less than a half a meter in diameter. A pad is not needed on the lip of the pit due to the dirt, mud, and plant debris which covers the lip of the pit. For our survey we decided to drop through the larger of the two holes which happens to be Pit Entrance 1. Using the rope as a plumb bob we descended the highly fluted pit taking left, right, front, and back shots with our Leica Disto laser range finder in one meter increments. The pit turned out to be a mere 7.3 meters in total depth. Once off rope we surveyed the pit as a horizontal cave, which only took one more shot.

The floor of the pit is rather nondescript, the only real feature is a small drain located in the floor close to the southern-most wall. However before our ascent we

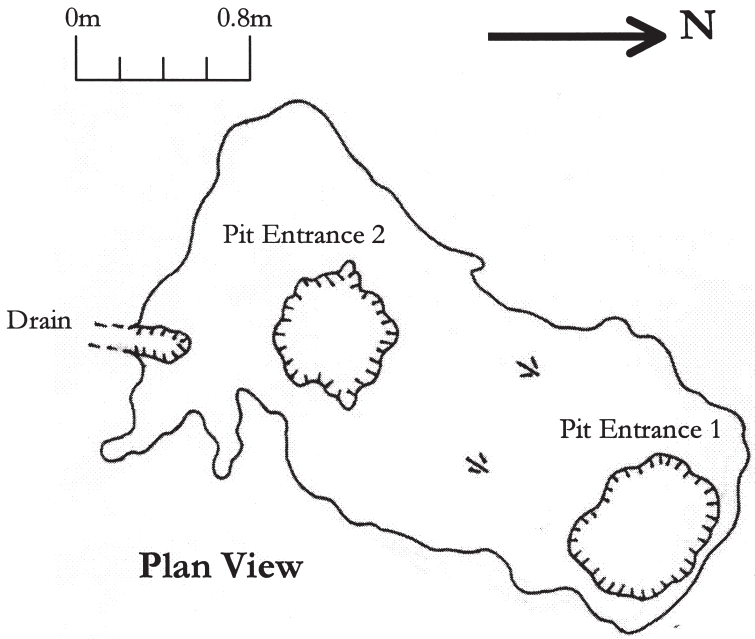
Mossy Pit

Carter County, Kentucky

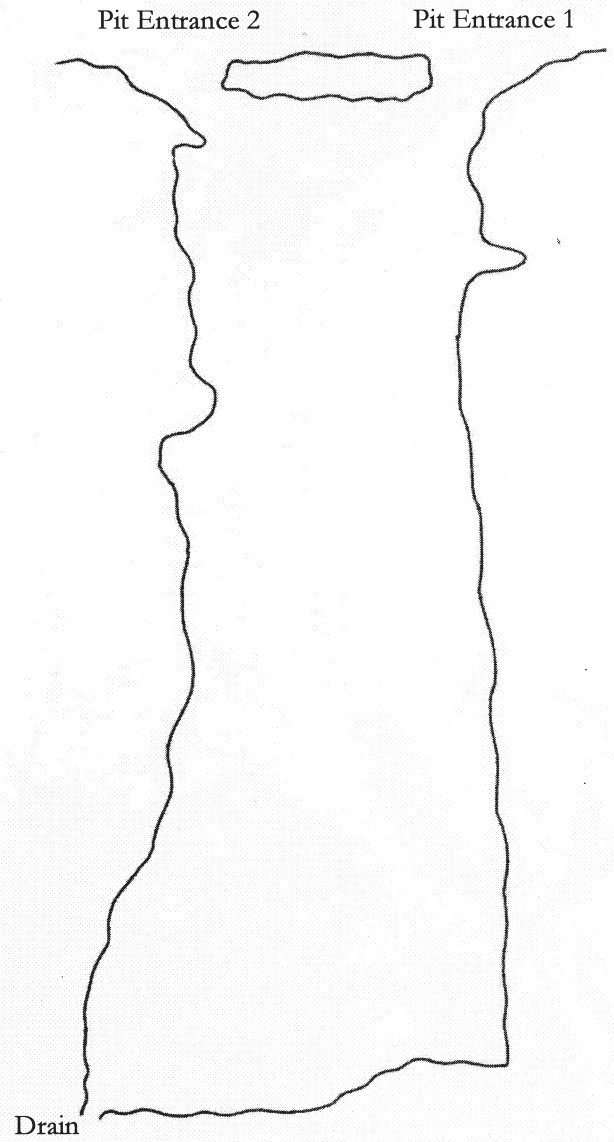
21 January 2006

Caleb Heimlich
Rachel Horowitz
Kevin Kissell

THC 3.7m TVC 7.3m



Plan View



Vertical Profile

KMK

Photos top to bottom:

Caleb Heimlich in Pit Entrance 1 of Mossy Pit.

This small orange newt was found hiding on the west wall of the pit.

A rather large wolf spider was observed in close proximity to the orange newt, maybe looking for lunch? Photos by K. M. Kissell.

noticed several different species of critters located on the walls of the pit. Numerous cave crickets, representing *Hadenoecus cumberlandicus*, were huddled together on the west wall of the pit. We also found a Wolf spider, multiple *Meta ovalis* orb weaving spiders, and a small (see accompanying photo) orange newt. By the time Caleb and I ascended out of the pit it was way past lunch time and we were hungry. We opted to head back towards the bunk house for a nice lunch before heading to our next survey destination, Haunted Pit.

Numerous *Meta ovalis* were found; this one was particularly good about holding still for the camera. Photo by K. M. Kissell.

Shannon Hill (left) and Kristen Baughman searching for aquatic fauna in the stream passage in Laurel Cave, Carter County, Kentucky.

Haunted (Spook) Pit, Carter County, Kentucky

Caleb Heimlich
(WUSS #0539, NSS #55745)

Katerine Ferguson
(WUSS #0544)

Jared Embree
(WUSS #0440)

Rachel Horowitz
(WUSS #0531 NSS #56553)

Kevin Kissell
(WUSS #0530, NSS #54578)

Aaron Taylor

21 JANUARY 2006

Surveyors were Kevin Kissell, Rachel Horowitz, and Caleb Heimlich. We began by establishing our surface points that define the depression around the pit (Figure 1). Four surface points were used in a radial survey from the survey point that was farthest from the cave's entrance. Our rope was rigged from the northerly side and also was used as the attachment point for our plumb line. After finishing with the surface points, our first "in cave" point was established where the rope cleared the lip and was free of the walls until it reached the debris pile at the bottom of the pit. We secured the end of a survey tape to this point on the rope since securing it to the rock proved difficult. Additionally, we marked the lip with hash marks on either side of where the rope lay to ensure we would be aware if the rope changed position during any of the rappels. A spotter was left at the lip to watch for any change in the rope's position until the plumb line was no longer needed. This proved to be useful as we did not finish the survey in one day and used the marks to position the rope in precisely the same spot on the second survey date. Distance measurements were taken every two meters with a Leica Disto laser rangefinder in roughly a front, back, left, and right in orientation with the plumb line point at the lip (south, north, east, and west, respectively). There was no way to mark points on the wall for all the directions, particularly for the right (easterly) measurements, so the measurements were used for estimation in rendering the map only.

Figure 1. *Rachel Horowitz and Caleb Heimlich do a surface survey before entering Haunted Pit. Photo by K. M. Kissell.*

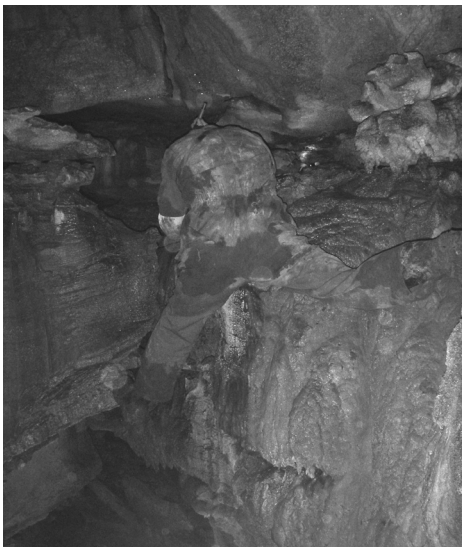


Figure 2. *Caleb Heimlich spans a dome room to get to the upper section of the survey. Photo by K. M. Kissell.*

At approximately three meters down the drop we found a high lead that looked promising on the easterly side of the pit. We promised ourselves a little creative scouting after the rest of the pit was surveyed since getting to the high lead would involve a roped traverse.

The portion of Haunted Pit's floor directly beneath the entrance is actually a large and very muddy debris pile with plenty of soft decaying leaf litter from the trees above. There is some moss growing in small parts of the wall since sunlight reaches the bottom readily (Figure 6). There also were cave crickets (*Ceuthophilus* sp.), harvestmen (Figure 5) Eastern Pipistrelles, and some sort of beetle present. On a previous trip to Haunted Pit, we also found the bioluminescent larva of a lepidopteran. All told, the pit has a fairly active biological community.

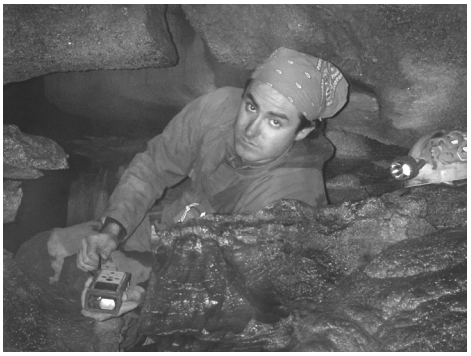


Figure 3. *Jared Embree takes passage measurements using a Leica Disto laser range finder. Photo by K. M. Kissell.*

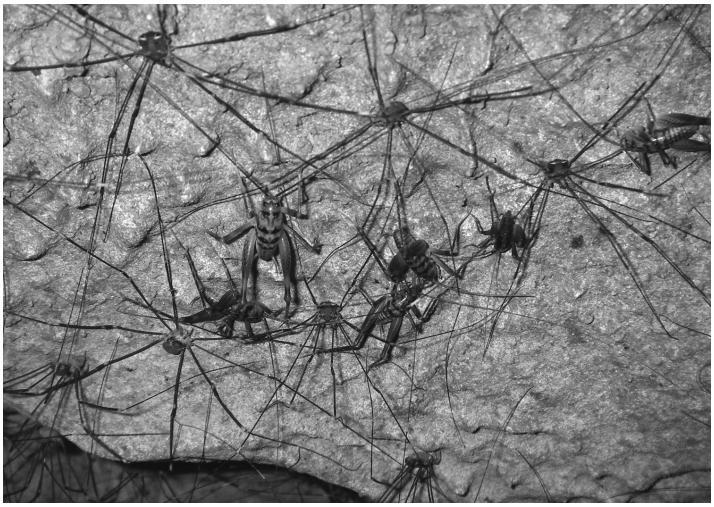


Figure 5. *Numerous harvestmen and cave crickets were observed huddled together at the bottom of the thirteen meter pit. Photo by K. M. Kissell.*

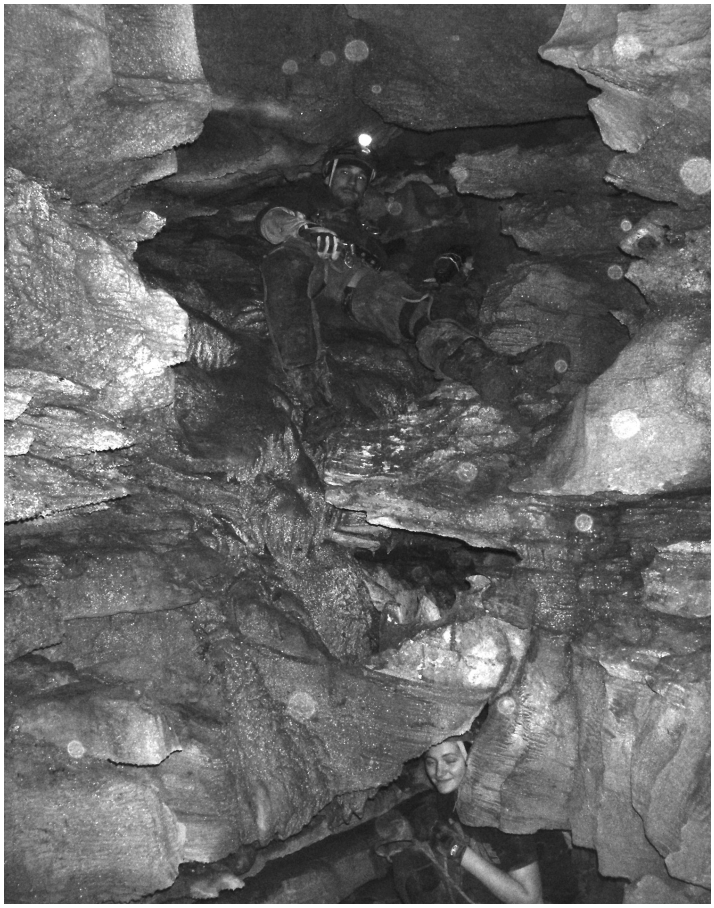


Figure 4. *Caleb Heimlich and Kate Ferguson show the entrances to the upper and lower passages leading to a dome room in Haunted Pit. Photo by K. M. Kissell.*

The southwestern portion of Haunted Pit is fairly straightforward. It is the most open area of the pit and lies on the steeper and longer side of the debris pile below the entrance (see map, Figure 6). The opposite side of the pit is a little more interesting and has a small room that is separated from the rest of the pit and debris pile by some rock features. Our terminal survey points in this area of the cave end in the lower lead on the floor and an upper lead about midway up the wall. The higher lead ends in a small room just large enough to sit in.

At this point in the survey we were running behind schedule and we decided to set a few bombproof points and retreat to the Caveland Lodge to meet the rest of our party for dinner. We arrived at three minutes past the end of the dinner seating (much to the dismay of our hostess) but enjoyed a lovely meal all the same.

28 JANUARY 2006 CRAWL-A-THON

Surveyors were Kevin Kissell, Caleb Heimlich, Jared Embree, and Aaron Taylor. Attempting to finish the survey of Haunted Pit was one of the things on the agenda for Crawl-a-thon weekend. We were anxious to finish the survey of the bottom so we could reward ourselves with getting into the high lead. We didn't really care if it was a "sucker hole," we knew we were going to have fun just checking it out and, after all, fun, as usual with Crawl-a-thon weekend, is always a prime objective. In the morning we met with Horton Hobbs and Bill Stitzel who were in charge of the "pit-plunging" trip and Haunted Pit was on their list. We set a time to meet and also were fortunate enough to use their rope for the survey which was already rigged. We were also able to conscript the aid of two of their trip attendees: Jared Embree (a WUSS alumnus) and Aaron Taylor, who were interested in surveying with us. After we finished the survey of the bottom of Haunted Pit, we set our sights on the high lead. Caleb had brought along some

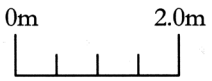
Haunted Pit

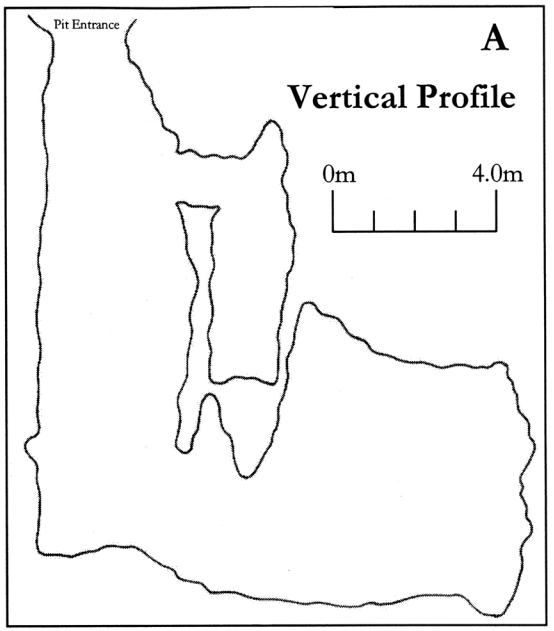
Carter County, Kentucky

21 January 2006 – 25 February 2006

Jared Embree
Kate Ferguson
Caleb Heimlich
Rachel Horowitz
Kevin Kissell
Aaron Taylor

THC 44.2m TVC 13.1m





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of his climbing protection in case we ran into rock that was of sufficient quality to protect the traverse over to the lead. The traverse, however, was not particularly difficult and did not require any additional protection as long as you were judicious in the slack you paid out and were careful.

After a little squeezing through the loose entrance to the lead Caleb found himself on a small ledge large enough to sit cross-legged with a small speleothem still actively dripping. Also there was a small pile of bones on the ledge, the longest of which appeared to be a leg bone for some kind of mammal and was probably about 7 or 10 centimeters long when whole. We were not able to determine what kind of animal it had been. Much to our delight the ledge ended abruptly after about a meter, dropping away sharply into another smaller solution pit. Caleb shouted the news to the rest of the group and found a safe space to sit and set a survey point in the lead. Jared then reset the rope in the marks on the lip and attached the survey tape back to the plumb line survey point. At exactly 3 meters down he was able to see the point and, after a little finagling getting the compass away from the rack and helmet lights, we were able to get a bearing. Jared then climbed out and Caleb couldn't resist pulling the rest of the rope in and dropping it down to check out the new area. He spent a few minutes looking around and found no new leads but took the rough dimensions of the new area with the Disto and hurried back up rope. At this point a couple of members in the group wanted to be back for some scheduled cave tours, and the uncommonly warm, sunny day brought an end to our survey for the afternoon.

Figure 6. *The entrance drop is well lit by the afternoon sun while artificial light is provided by a secondary flash. K. M. Kissell.*

25 FEBRUARY 2006

Surveyors were Kevin Kissell, Caleb Heimlich, and Kate Ferguson. We made it out to Haunted Pit in the morning and immediately set to work in the new area. We got through the remaining survey in just a few shots, using a plumb line from a feature on the lip again, though this time it was not secured to the rope. This new section of the pit is much drier than the rest of Haunted Pit as was evidenced by the almost ubiquitous small "popcorn" like bristles on much of the surface area of the pit. The portion just below the entrance drop is fluted and fairly smooth, but the rest of the room was fairly prickly with these speleothems and we tried to move as gingerly as possible. After the area below the short entrance drop there is a small rock feature to climb over that has a distinctive speleothem on it. Up on the right hand side, despite the drier nature of the room, there is an active formation. In a small depression in the floor of the back of the room there is a large stalactite that has fallen from the ceiling and somewhat resembles a ladle sitting in a bucket. A few cave crickets (*Ceuthophilus* sp.) and two Eastern Pipistrelles were present.

Towards the end of the survey Kate noticed a little bit of light in the terminating passage. We shut off out headlamps and confirmed that it was daylight. She had located a small aperture through which the main entrance drop of Haunted Pit could be seen. It was shorter and narrower than my arm but we had located a voice and sight connection to the main pit. The lower areas of the secondary pit, including a gravel sink below the entrance drop and a drier drain towards the back of the room likely are (or were) hydrologically connected to the entrance pit, but alas too small to fit through. There was one crack in the wall towards the entrance to the secondary pit though which some drips could be heard. The drips sounded as though they were landing in a larger area just behind the crack, but the size of this area through the crack could not be determined.

Bio Cave
Carter Caves State Resort Park
Carter County, Kentucky

Matthew Hazelton (WUSS #0449)
Kristi Krumlauf
Justin Estep

Equipment:
A pair of Suunto (combination compass and clinometer) instruments as well as a Leica Disto laser rangefinder were used to make all measurements. Compass (latest version as of January 2006) cave mapping software was used to plot the data.

Biota:
Meta ovalis
Cave crickets *Hadenoecus cumberlandicus*
Wolf spider
Harvestmen *Leiobunum* sp.

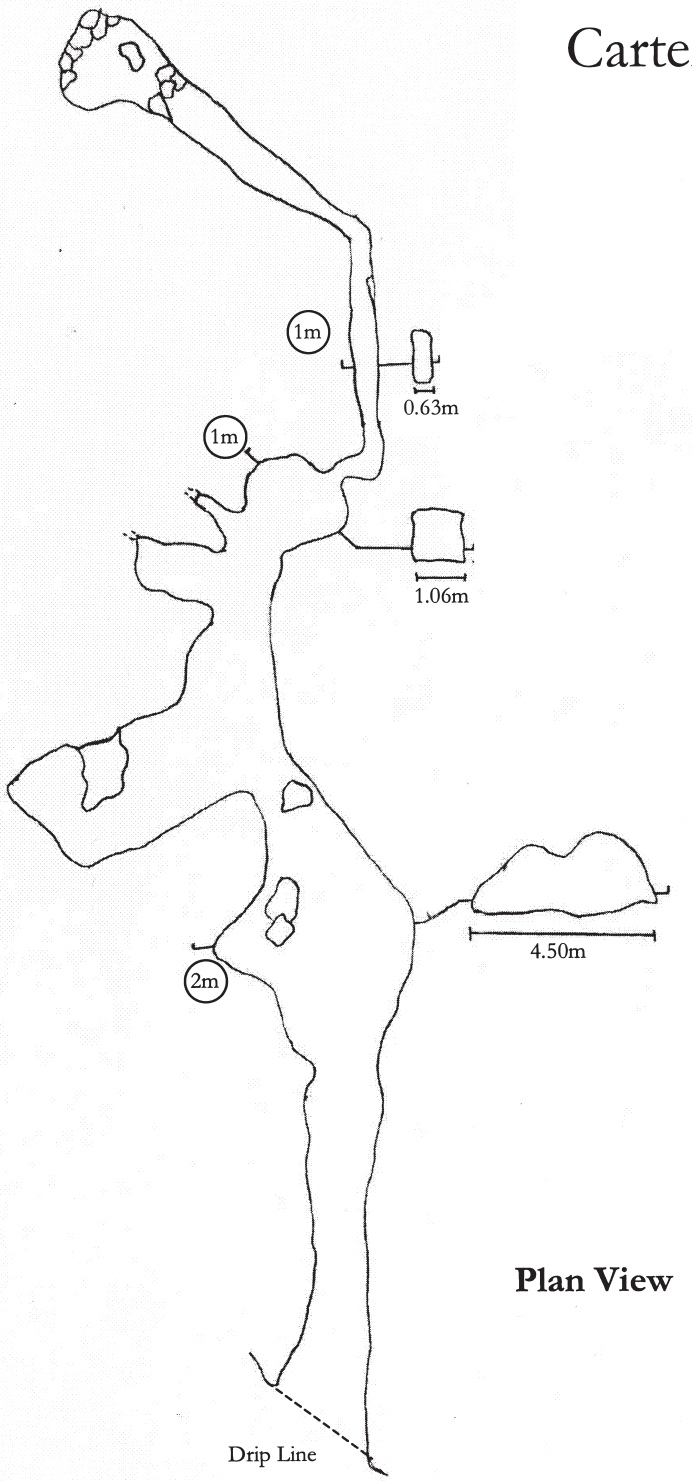
21 JANUARY 2006

Bio Cave is a well used, easily considered sacrificial, small cave located near Smokey Bridge in Carter Caves State Resort Park, Carter County, Kentucky. The location and ease of entering the cave lead it to be explored frequently. There is some litter but surprisingly little graffiti in the cave. The relatively minor amount of graffiti may be attributed to the low crawl that somewhat separates the front third of the cave from the rear two-thirds (see map). The entrance is a typical phreatic, elliptical shape with a flat floor of densely packed dirt. Upon entering you stoop and then crawl through a fairly straight tunnel until you reach the slight horizontal squeeze with a low-ceilinged room off to the left. Bearing slightly to the right of the room leads you to another small room which has a ceiling height of approximately one meter. This second room is barely past two small offshoots to the left that are short dead ends with no possible leads. The room does have one passage that leads further into the cave. This is a canyon shaped passage with a sharp right then left curve that leaves you facing into a passage that has a short straight section that then curves left and leads to one last straight section that is ultimately choked off by large breakdown. The biota is very limited because this is a dry cave that is used often. Harvestmen (*Leiobunum* sp.), a wolf spider, *Meta ovalis*, and cave crickets (*Hadenoecus cumberlandicus*) were observed on the survey day.

Bio Cave

Carter County, Kentucky

21 January 2006
Justin Estep
Matthew Hazelton
Kristi Krumlauf
THC 43.6m



0m 1.5m

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Plan View

Wittenberg University Speleological Society

MH

Sloan's Valley Cave

Kevin Kissell (WUSS #0530, NSS #54578)

17–19 FEBRUARY, 2006

The February Sloan's Valley Kentucky trip has been a tradition of WUSSes for many years now. I don't know what it is; maybe it is the frigid weather or the prospect of going into parts of the cave that cannot be reached in the summer due to the high water levels, but the February trip is one of my personal favorites. The showing of support for this year's trip was quite good despite the early reports of freezing temperatures and the likelihood of snow. WUSS was represented by Kate Ferguson, Caleb Heimlich, Rachel Horowitz, Kevin Kissell, and Erick Twaite. Also joining the WUSSes was Victor Fowler from Cleveland Grotto and our trip leader was Mike Goltzene from WUSS and Dayton Underground Grotto.

Looking for a way out?

The trip started off better than normal in that we actually left the Science Building on time (perhaps a first in WUSS history!!). We arrived in the field below Tom Crocket's house around 10:30 p.m. and started setting up camp under a clear starry night. By 11:15 p.m. we were sitting in the big tent talking and trying to stay warm. Most went to bed around 1 a.m. or so; Mike arrived and went to sleep in his car around 2 a.m. The morning sunlight brought with it typical February weather. A quick look at the thermometer gave us a -6° C morning temperature. A hot breakfast consisting of oatmeal and hot chocolate was made before we started dragging out the caving gear. The original plan for the day called for a through trip from the Garbage Pit entrance to the Great Rock Sinks entrance. The only thing that could stop us was high water around an area of the cave known as the "Fountain of Youth."

By 9:30 a.m. we were underground making our way to the "First Lake Room," our first of many side trips on our way through Sloan's. After the "First Lake Room" we continued along the "Appalachian Trail" towards "The Big Room." Needless to say "The Big Room" is well named; it consists of a chamber roughly 150 meters long by 30 meters wide by 30 meters tall. Large pieces of breakdown cover the floor and a wrong step could send you sliding down an eight meter hill of mud. Not far past this enormous chamber lies the "Fountain of Youth," one of our main goals for the day. However less than 90 meters from the "Fountain of Youth" we encounter a formidable problem. The passage begins to slope down into a pool of water that stretches the entire width of the passage and continues around a corner for an unknown distance. Checking the elevation reading on the map we figure the water was about six meters deep. While swimming underground is not a problem, we face a decision: do we want to turn around and go to other parts of the cave or do we want to get completely soaked and finish the through trip. After a few minutes we decide to try to get past the water obstacle by standing on an underwater ledge and holding onto the wall for support. As we continue along the ledge it slowly starts to disappear. With water above the formidable "Oooh Line" we find that we no longer have a ledge on which to stand. Rather than continuing on and swimming we decide it best to turn around and cancel our plans of seeing the "Fountain of Youth" and making the through trip. Looking back it was

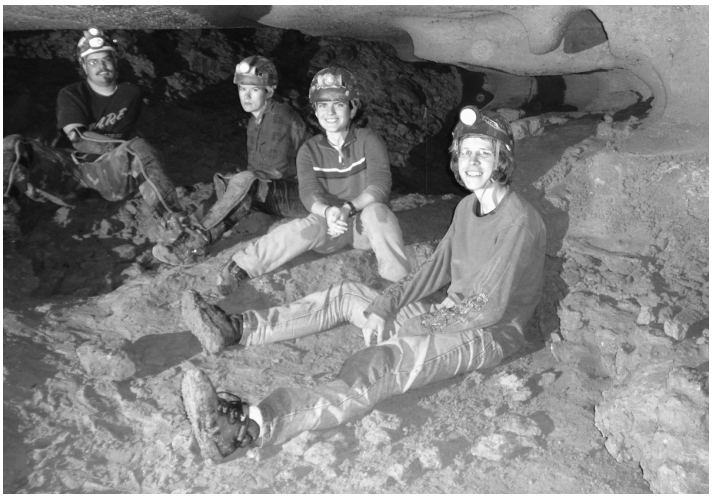
the best decision; if we had made the through trip we would have had a kilometer long hike in 0° C weather just to get back to camp.

A little sad we turn and head back for the Garbage Pit Entrance; along the way I injure my right knee making the trip out longer than anticipated. Upon reaching "Garbage Pit Hill" I head for the exit while the others stay and play in a few side passages at the base of the hill. The rest of the team emerges from the cave a half hour later to the smell of hot chocolate; it is 3:30 p.m. In someone's infinite wisdom they suggest instead of cooking we go into town and find a Mexican restaurant for lunch. Mike however is not feeling well and heads for home shortly after the rest of us head into town.

Upon returning to camp, our bellies full of gaseous and delicious Mexican food, Caleb, Vic, and Kate feel they have not punished their bodies enough. The three of them head back underground around 5 p.m. for a five- hour trip through "The Oasis," the "Music Room," "Bare Bev's Bellycrawl" and out the Scowling Tom entrance.

Feeling the warm air from the Garbage Pit Entrance.

With the temperature dropping rapidly we decide it is best just to crawl into our warm sleeping bags and sleep through the cold. Waking the next morning to a -9° C reading on the thermometer we make breakfast and start dismantling the camp site. By 10:30am we are on the road in a slowly warming Witt van heading back to campus, taking with us a few cold bodies and warm memories of yet another February Sloan's caving trip.



Left: *A cold, white, winter morning for the WUSSes.*

Bottom left: *What a crew! Pictured from left to right: C. Heimlich, E. Twaite, M. Goltzene, R. Horowitz, K. Ferguson, V. Fowler.*

Below: *Smiling in Coon-In-The-Crack Cave I. Photo by H.H. Hobbs.*

Fantastic Trip Report

Michele L. Maxson, (WUSS #0515, NSS #53048)

17 OCTOBER 2005

Fantastic Crew:
Caleb Heimlich, Kevin Kissell, Andrew Linsenmeier, Michele Maxson

TAG Crew:
Katie Ferguson, Caleb Heimlich, Rachel Horowitz, Kevin Kissell, Andrew Linsenmeier, Michele Maxson, Erick Twaite, Jeff Soronsen

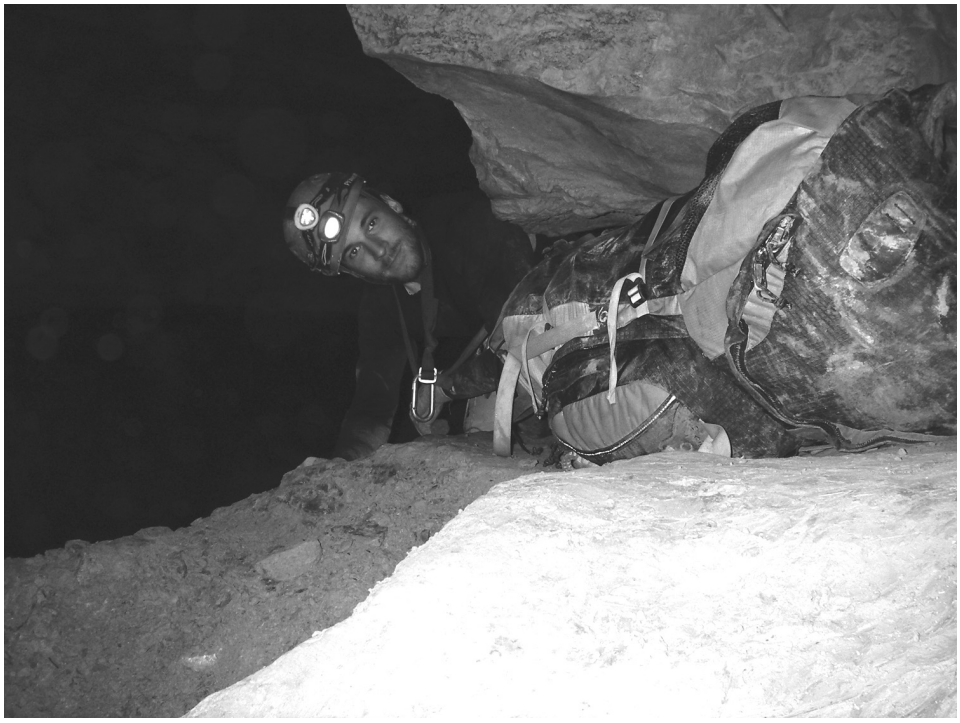
Caleb Heimlich looks happy as he prepares to start his 180-meter rappel of Fantastic Pit. Photo by K. M. Kissell.

On 17 October 2005, the TAG group started on their way up to the Ellison's Cave System. For the trip up the mountain Caleb carried the 215 meter rope and rigging gear and Andy had the two short ropes and his personal gear. Everyone hauled their own vertical gear and we divided Caleb's equipment amongst us. It was around 2:00pm when we finally reached the New Dug Entrance to Ellison's. Andy, Caleb, Kevin, and I loaded up the ropes, rigging, and personal gear and climbed down into the entrance. The passage from the New Dug Entrance to the Warm-up pit was a large passage with minimal breakdown lying in the creek bed. It was approximately two meters wide and three meters tall with shear limestone walls and a slow moving, shallow stream on the floor, not even deep enough to get our boots wet. The passage trended downward and ended at a couple of large boulders which constituted the climb for the Warm-up Pit. We climbed right, up a well worn slab of breakdown about three meters above the passage and found ourselves at the rig point for the drop. There were a number of bolts at the ledge and we chose the newer looking two in the ceiling, using them for our primary rig point, backed up to a third bolt that had been placed in a large boulder on the floor. The first six meters of the Warm-up Pit was a smooth lip that curved continually outwards until it eventually gave way and it was a smooth free drop for the remainder. As we rappelled into the void below, we were given our first glimpse at this ominous cavern into which we were venturing. We noticed, during the rappel, that there was an old rope hanging, presumably rigged someplace down passage from our rig point, but didn't investigate. The old rope ended about five meters from the ground and there was no knot at the end- scary. At the bottom of the Warm-Up pit Caleb, first down, found his first piece of booty, a knife. Hmmm, short rope, knife…kind of creepy to me.

The bottom of the Warm-up Pit was of irregular shape, filled with piles of large, slick, breakdown. Water came down in two distinct places. The four of us climbed over the small breakdown pile at the bottom, continued over a larger one that led to passages that took off in three directions. The breakdown had been rigged with a hand line. The hand line was frayed almost completely through near the knot where it was secured to a boulder. This climb can be done without a hand line but is not easy, especially for shorter people. Once we got to the top of the next breakdown pile, we were given three more choices. To our right were what appeared to be two canyon passages, one on top of the other that were perhaps just two ways to access a keyhole canyon that leads to the balcony. The upper passage required an unroped and sketchy traverse around a drop of about seven meters. The drop itself led to the "lower" of the two passages. There was a hand line rigged around a boulder at the top of the climb-down, but the rope looked old and unsafe. The third choice was pre-rigged rope that went to the top of the 12 meter canyon that we were in. This rope

also looked very old and we could not see the anchor point. We chose to attempt the climb up rather than the climb down since we wanted to get to the attic, and after consulting our map, decided up was the way to go.

Caleb gave a few rough tugs on the rope and waited it to see if anything would come tumbling down. He then put on his ascending gear and climbed the rope as smoothly and cautiously as possible then spent a few minutes looking around in the passage above. Once it looked like a good way to go, I also put on my climbing gear and climbed up to see what was up there. Once at the top of the climb, Caleb and I scrambled over more large boulders and tip-toed around a few small holes that probably fell into the deeper canyon below. We found what we thought was Fantastic and tossed a fist sized rock down. It sure didn't sound like a 182 meter pit the way the rock fell. So Caleb shimmied around the corner of the pit over a small ledge, which also had a hand line rigged to it, and looked around a bit more. He found three bolts on the ceiling indicating what we guessed was the rig point in "the attic." As he scurried back around the traverse, he picked up another rock and threw it into the void again. This time the rock hit the opposite wall, and after a few seconds, we heard the low echo of it hitting the bottom of the pit. We were sure now that we had found what we were looking for. Caleb and I stood at the top of the pit for a few more minutes tossing in rocks, trying to decide the best place to rig to avoid hitting the balcony since we were not sure exactly where the balcony was, although we knew we were in the attic of Fantastic. We decided to rig on the side with the bolts and made our way back to the nuisance climb and had Andy and Kevin below pass up another rope that we rigged for them to climb. The four of us continued to haul the gear up the rope, down the passage, around the sketchy holes, and over the traverse. We decided not to rig to the bolts because we had heard that these bolts were not safe. Upon inspection we reached the conclusion that the primary bolts looked ok, but the back up bolt looked poorly placed. For our piece of mind we rigged the rope to a large boulder that had obvious wear marks from other ropes, and backed up down passage onto a second large boulder. We lowered the rope by hand until it began to get heavy and finished the job feeding it through a rack. The walkie-talkies were passed out and Caleb started the rappel into Fantastic. Once Caleb reached the bottom, Kevin followed and I followed Kevin. It was about 15 meters down the rope that I realized, in my excitement; I had left all my ascending gear up top. Thankfully, I called up to Andy who hooked my gear to him and promised to rappel down with it.



Caleb Heimlich works his way around the traverse going to the attic at the top of Fantastic; the bag contains the 200 meter rope necessary for the drop. Photo by K. M. Kissell.

Once the three of us were safe on the bottom, Caleb began his 30 minute frogging ascent to the top while Andy watched for rope rub at the top of the pit. The two of them decided that there was too much rub even with the pad, especially for tandem climbs, so they rigged a webbing bow over the lip. Then Andy rappelled down, my gear in tow, and Kevin and I rope-walked for an hour out of the pit together. When we made it to the top, Andy followed, frogging for 30 minutes. By this time we were already over our seven hour time limit so we hauled up the rope and de-rigged as quickly as possible. Then it was back around the traverse, down the passage, down the nuisance drop, down the slippery breakdown and up the Warm-up Pit. The 36 meter pit suddenly felt like a drop in the bucket compared to the amount of time we had just spent on rope. Andy and Caleb stayed to de-rig the Warm-up Pit as Kevin and I hauled our gear, the rigging gear, and the 215 meter rope back up the dug passage and climbed out the entrance. Much to our delight we were welcomed at the top by a group of cold WUSSes huddling around a fire, making fun of us for being three hours over our time limit. The trip went very well and none of us was overly worn down from the climb out of the pit, and were all very appreciative of what we had just accomplished. Next, Golondrinas!!

An Education Major's Perspective on a Biology Class

Linda Oxenrider (WUSS #0535)

I had been a Wittenberg University Speleological Society (WUSS) member for one year when I realized how much more there is to learn about caves that I could not learn through spelunking. (I have not yet earned the title of full "caver," because, as you know, "cavers rescue spelunkers," and I would be more likely to need rescuing than providing it underground.) Luckily I was able to reserve a front row seat in Dr. Hobbs' Biology 143, Cave Ecology class. While diligently taking notes, like the good college student I am, (please contain your laughter) I learned a lot about the delicate cave ecosystem and environment. The most interesting thing I learned was about the diversity of cavernicles (or cave dwelling animals). I also enjoyed learning about the plant life in caves, so much that I wrote a wonderful ten-page paper about it. As much fun as the hours spent reading and listening to lectures were, my fondest memories of the class will always be of not one but two weekends spent in northern Kentucky with other brave class members.

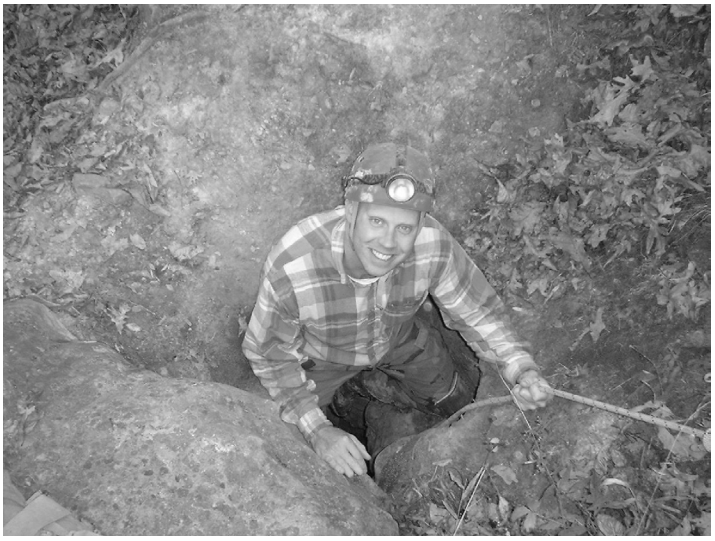
These glorious weekends were spent hiking, caving, eating, sleeping, and little else. This was not my first time caving, or should I more accurately say spelunking, but it was for the rest of the twelve people on each trip. It proved to be one big adventure in the backwoods of Kentucky. On the first day we set up camp and went on an infamous seven-hour hike. We college students did our best to keep up with Dr. Hobbs as we toured the Carter Cave State Resort Park. The first day also brought the first underground explorations. Everyone was issued a helmet and head light and off we went into the great infinite underground abyss. We went through Lower Laurel and Horn Hollow, which are fairly easily navigated caves, to learn about the basic features. We saw roosting and flying bats, salamanders, cave crickets, spiders, crayfish and the occasional Olm or some other dreaded cave dwelling scary blood sucking monster.

After a good dinner we all turned in early for some much needed sleep. We got up at the crack of dawn for another day of cave ecology adventures. This day was a little more daring; we visited Coon-in-the Crack and H_2O caves and even got really dirty on a mile long (well maybe it was only a few feet) belly crawl. We all quickly became more comfortable underground, so after lunch we spent a few hours counting and tagging cave crickets in Coon-in-the Crack. That night around the campfire we discussed ideas for our big research projects. My small group looked at pollution distribution in caves. We were reduced to lonely trash collectors, but nevertheless we collected data about the variations and locations of litter we found throughout a few different caves. Upon returning to school we conducted further research about human impact on caves, and wrote a paper and gave a presentation on our findings. My first class trip proved to be exhausting and even more educational than I expected. I learned a lot by being guided through the caves and hearing about speleothems while actually looking at them. Flowstone is much easier to understand when you are watching the water pass over it. We took a lot of time just to look and appreciate the different cave features. We learned how to survey a cave and make plan maps while in a cave, which made us all appreciate the maps we saw in class more. Even people that were terrified by spiders and bats began to look at them in a new, less intimidating light. Don't get me wrong, some people still screamed every time a bat came flying "straight" at them. But later these same people were inspired to research echolocation to understand better how they always seemed to manage to avoid a potentially deadly collision with an airborne bat.

I had so much fun on that trip I decided to go on the next class trip the following month, but this time not as a serious college student but as a WUSS assistant. My second trip was slightly shorter than the first but still fun. I helped guide other students as they conducted their research. I was able to slow down and spend even more time appreciating the beauty of cave speleothems and making sand castles out of cave mud. It was fun for me to be able to watch this group of ten students spelunking for the first time as they also came to the realization that when Dr. Hobbs was lecturing he was talking about actual places and things. Caves suddenly became more interesting, and the students became more intrigued in a larger variety of aspects of the cave ecosystem. I wrote a paper about the growth of Lampenflora after seeing it in Cascade Cave and asking what it was. I will always have a better understanding of caves as I go caving now. Not only did these trips improve caving for me personally, they also exposed new people to caving and brought the classroom to life for all the students that were lucky and smart enough to join in the weekend adventures in the backwoods of Kentucky.

NECROLOGY

G. Sean Crossman
WUSS #0154 Life



G. Sean Crossman

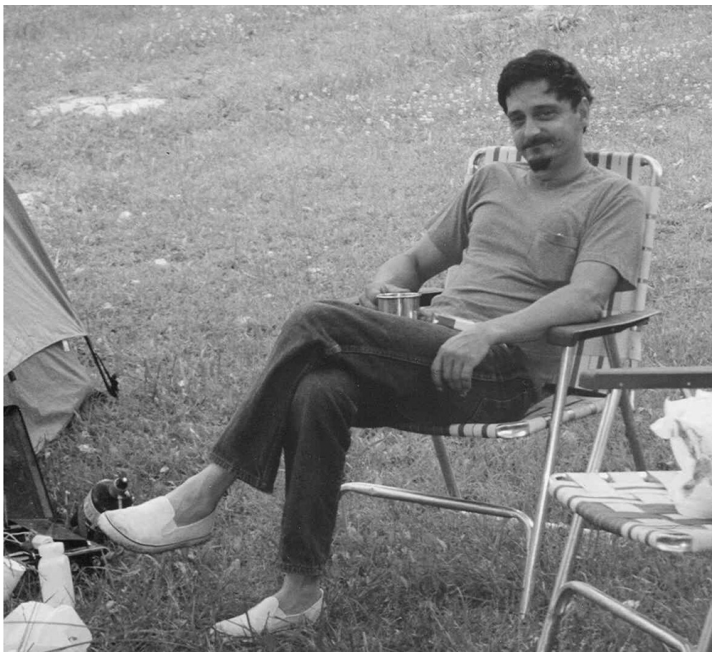
G. Sean Crossman of Lebanon, Ohio, died in a skydiving accident on 2 July, 2005. He was a master skydiver with over 2300 jumps, and greatly enjoyed instilling his passion for the sport into others. Tragically, Sean died instantly after an out-of-position videographer collided with him in midair during a tandem jump. His family and friends will remember Sean for his love of life, his family, and the outdoors. Sean was a devoted family man, and left behind a loving wife, Maureen, and two young children, Rachel and Thomas. He loved fatherhood, and was always ready to report with a smile what both his children were doing. Rachel was 2.5 years old at the time of her father's death, and Thomas was only 7 months old. How he will miss watching his children grow and prosper! Apart from his family, Sean's other interests included caving, softball, volleyball, and brewing beer. Sean was an exceedingly loyal and protective husband, father, and friend. He will be missed by many that considered Sean more of a brother than a friend.

Sean graduated from Wittenberg University in June 1990 with a major in Chemistry and a love for people and the outdoors. He was an avid caver with W.U.S.S., a hobby that he continued long after his graduation. He led numerous caving expeditions for many years.

Sean worked in industry for approximately ten years before returning to school and earning his Master's degree in Materials Engineering from the University of Dayton in the spring of 2004. At the time of his death, he was pursuing his Ph.D. in Materials Engineering at the University of Dayton and working as a material engineer at the U.S. Air Force Research Laboratory at Wright Patterson Air Force Base.

Cathy L. Pederson

Howard E. Kronk
1952-2005
NSS #27644, WUSS #0133 Life



Howard E. Kronk

On 28 September 2005 the caving club suffered a tremendous loss. Our near and dear friend Howard "Howie" Kronk had a heart attack and passed away. Howie had been an active WUSS for many years and was an enormous asset to the club. All those in the club who knew him feel an immense bereavement, for many of us the passing of Howie is too much to endure. For this reason there is not an obituary for him in this issue of *Pholeos*; the loss is still too great. Instead please consult the March 2006 issue of the *NSS News* for a complete obituary. Our thoughts and prayers go out to his wife Carla, their children, and all those fortunate enough ever to have met the late Howard Kronk.

Kevin Kissell
WUSS #0530
NSS #54578

Princeton Tec Quad Headlamp

Caleb Heimlich (WUSS #0539, NSS#55745)

There I was standing in the vendor tent at Crawl-a-thon, suddenly presented with a choice. I wanted a low profile, close proximity light that could easily be removed and replaced from my caving helmet for survey work and general tinkering around. I walked in with the intent to purchase a Petzl Tikka Plus. Petzl's Tikka line has been the standard in lightweight headlamps for some time. I've used them, and like them. Tikkas and Zipkas hang from rear view mirrors, dangle around necks like jewelry, live in med kits, bail bags, on key chains, nightstands, and in toolboxes. Spend any time at all outdoors and you're likely to have one within reach most of the time even if it isn't yours. Tough and reliable, I hadn't really considered getting anything else, because there wasn't anything else that fit that niche. Enter the Princeton Tec Quad. Both have 4 LED's and similar specs (we'll get to splitting hairs later). However, with 3 watt single LED's becoming more common and light output seemingly improving daily, I wondered if the small AAA powered 4-LED headlamp might one day go the way of the dinosaur. But, today was not that day. I had a survey to work on in the morning, some money burning a hole in my pocket, and the sudden availability of choice in an otherwise cornered market had awoken the capitalist slumbering deep in the nether regions of my soul.

Now, to the specs and hair splitting. You can skip to the end if you just want to know how much a Quad costs. Read on if you are a complete nerd.

The first thing that you will notice comparing the Quad with the Tikka Plus is that the Quad is slightly larger and heavier. The listed weight with batteries for the Tikka Plus is 78 grams and the Quad tips the scale at 96 grams. If you are a lightweight freak, drilling holes in your toothbrush, this might matter to you. To me, it didn't. Another thing you will notice is that the Quad tilts WAY more than the Tikka Plus. The Quad tilts 90 degrees, whereas the Tikka Plus only comes out a little ways. The drawback is that the little plastic ridges that hold the Quad in its tilted position are much looser than the Tikka Plus. The Tikka Plus has a stiff "click" that lets you know

The Quad is so small and light weight you can hang it around your neck and forget it is there. Photo by K. M. Kissell.

The screw for the battery compartment can be unscrewed by using the adjustment clip for the headband on the Quad. Photo by K. M. Kissell.

Below are the light durations and distances listed for the Tikka Plus and Quad, taken directly from Petzl and Princeton Tec's websites.

Tikka Plus

Light duration/Distance Test 20°C - alkaline batteries
4 LEDs

Maximum 100h	Optimum 120 h	Economic 150 h
t0=32 m	t0=23 m	t0=15 m
t30mn=25 m	t30mn=20 m	t30mn=14 m
t10h=15 m	t10h=13 m	t10h=11 m
t30h=5m	t30h=6 m	t30h=9 m

Quad

High 50 h	Medium 70 h	Low 100 h	Flash 120 h
25 m	16 m	12 m	25 m

**Distances for the Quad are estimated from a graph on Princeton Tec's website*

that if you jump up and down, it's going to stay put. The Quad can get slammed down so it's practically pointed at your nose if you jerk your head down quickly, or like head banging to heavy metal while walking around in the dark. The Quad is also rated as water proof to 1 meter for up to 30 minutes, the Tikka Plus as weather resistant. Instead of the plastic snap connection that the Tikka Plus has, the Quad has a rubber gasket around the battery case and a small screw that holds the light to the backing. Don't worry, you don't need any tools, the screw is easily loosened and tightened using the plastic buckle that adjusts the headband. The screw stays put in the assembly as well, so you won't be searching around in the dark for a tiny screw without the aid of your light. The Quad also has a low battery indicator which the Tikka Plus lacks.

It is important to mention that both Petzl and Princeton Tec define a useable light source as one that provides at least 0.25 lumens at a distance of 2 meters. Both also measure beam distance as the distance from the light source at which the light emitted is greater than 0.25 lumens. In both cases I think the times listed by Petzl and Princeton Tec to be generous. Sure, the light may emit for these periods of time but 0.25 lumens is pretty dim. Not bright enough, in my opinion, to be navigating a challenging cave, rock face, or trail safely. So as with any light, take the listed burn times with a grain of salt.

Petzl's technical notice for the Tikka Plus is more informative than the information provided by Princeton Tec concerning the Quad. The Quad is a "regulated" LED, but I believe Petzl's information gives a better idea of what this actually means. The Quad has a regulating circuit that maintains a very bright light provided there is enough voltage (I think it may be brighter than the Tikka Plus). When you lose voltage, which happens rather quickly, the first thing to go is the ability to change brightness settings. You will have one setting and the flash mode. The brightness of the light will diminish over time. So, while Princeton Tec's website boasts a 25 meter beam for 50 hours, know that the Quad will not maintain that impressive high beam for that amount of time.

And now, a word on testing conditions. Thus far I've used my Quad on two survey trips, one normal caving trip, one climbing trip, as well as in and around the car, tent, and firesides in between. I've used the light in caves and on approach trails. During the survey and climbing trips I used the Quad almost exclusively, and during the normal caving trip I used it at least half the time, boosting with my primary light when needed. None of these trips were particularly wet, and at no time was the light completely submerged so I can't really comment yet on the effectiveness of the Quad's water resistance. Princeton Tec lists the Quad as a level 2, or water proof integrity at 1 meter for up to 30 minutes. I still have the first set of batteries in the Quad, but the low battery indicator has started to blink, which is accompanied by a flash of the light so there isn't really a way to miss it. The light is noticeably dimmer, but still usable. I have not yet run it all the way down. I would estimate the total time usage thus far to be around 24 hours over a period of about a month. Temperatures have ranged from 15° C to -18° C .

On the whole I am happy with my Quad and it has proved thus far to be right on par with the Tikka Plus. Despite the slightly lower beam ranges listed for the Quad, I think it is brighter than the Tikka Plus, which could account for the slightly lower time durations as well. However, I've noticed no appreciable differences between the Quad and Tikka Plus in time durations as of yet. Also, I've had to dry a Tikka out after particularly wet caves followed by hot, humid weather because condensation would form on the lens. I'm anxious to see if the gasket and screw system the Quad has will alleviate this problem.

The final plug I'll make for the Quad is that it's cheaper than the Tikka Plus. At the vendor, the Quad was $30.00 versus $36.00 for the Tikka Plus. This seems to be about an average price difference between the two at the online vendors I've checked. My local outfitters (of which there are precious few) don't carry the Quad but do carry the Tikka. So, if you consider buying in person of utmost importance, you may or may not have a choice depending on where you live.

Pentax Optio WP Digital Camera

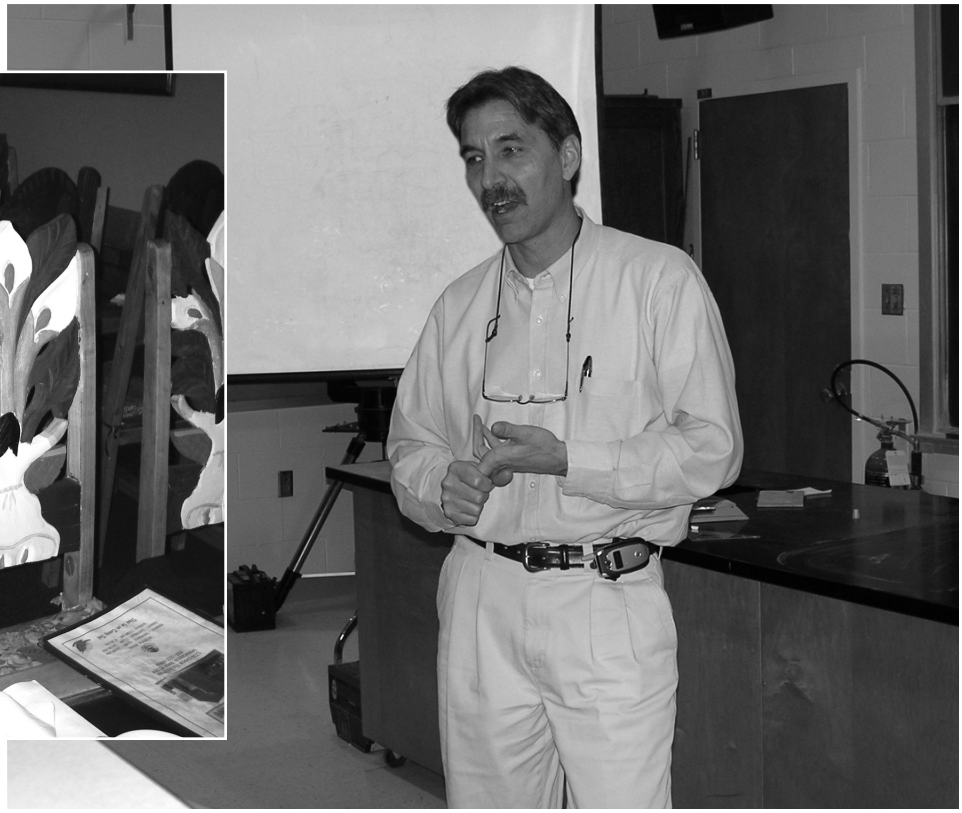
Kevin Kissell (WUSS #0530, NSS#54578)

Caving is hard on your gear - that is the understatement of the year! Here at WUSS we tell newbies not to spend more than twenty bucks on any single piece of caving gear since it will more than likely get destroyed during the rigors of a difficult caving trip. However what happens if you go underground and find a really impressive speleothem or critter? You can't take said object with you, so what do you do? You take a picture. Disposable cameras work but are usually not the best quality; digital cameras would be great but they are expensive and not "caver proof" - this has been a caver's problem for some time. Well here at WUSS we seem to have found a nice middle ground. The club has been looking for a digital camera for some time now. We had very basic criteria for our search. The camera had to be capable of high resolution pictures, have a macro feature, be compact, and most importantly, durable. The Pentax Optio WP may just be what we have been looking for.

Weighing in at 4.8 ounces and measuring a mere ten by five by two centimeters, the Optio is certainly compact however it still manages to have a five centimeter LCD screen. The Optio WP is capable of taking five mega pixel (2560x1920) photos while the more expensive Optio WPi can take six mega pixel (2816x2112) pictures. Other than the number of mega pixels the two cameras are identical. Both cameras have a 3x optical zoom and 4x digital zoom, as well as being able to take photos in a macro function which works great for your favorite critter shots, assuming you can get the critter to hold still. The camera runs off a rechargeable lithium ion battery and memory is held using a Secure Digital media card. Currently the club has a one gigabyte card that is capable of holding around six hundred high quality photos. While the camera has a manual mode, twenty preprogrammed modes take the guess work out of your shots, everything from action photos to night scenes to underwater photos can be taken with ease. Oh did I forget to mention the fact that the camera has a JIS 8 waterproof rating, which means the camera can stayed submerged to a depth of one meter for thirty minutes without any problems. Sure, it not very far down but if you or your camera is underwater for that long you may have a bigger problem on your hands. One of the hardest things about cave photography is getting enough light so one of the critical tests was whether it works with a slave, and wouldn't you know it sure does. Yet one of the most amazing things about the camera is not even mentioned on most of the reviews I have read for it; that would be the price. You can go to your local camera store and pick one of these bad boys up for, get this, about $250! In a world of bulky thousand dollar digital SLR's how can you go wrong with the Optio? It takes great photos, is durable, and cheap - the only mistake would be not getting one. The construction of the camera leads me to believe it is going to last. The body is made out of light weight aluminum. I have taken it on numerous caving trips and the only precaution I took was applying a screen protector to it. The camera seems to be holding up very well and the pictures it takes are beautiful. I now know of three other cavers who have recently bought the Pentax Optio WP, all of them love it and I am sure you would too, so go out and buy one - you know you want to!

The lens is not protected but a quick wipe with a clean cloth and it is ready to go. The Pentex Optio's controls are easy to read and use even while wearing caving gloves and it fits easily into the palm of your hand or into a pocket or cave pack.

GUEST SPEAKERS



The Wittenberg University Speleological Society has enjoyed presentations from the following guest speakers.

Niekamp (above left) – Andy Niekamp enjoys dinner with the WUSSes after his informative presentation on the Rockcastle Karst Conservancy (RKC). Mr. Niekamp spoke about conservation, preservation, and Great Saltpetre Cave (GSP) in his 22 February 2006 speech. We extend our thanks to Mr. Niekamp and hope the RKC the best of luck in acquiring more caves. Photo by H. Hobbs III.

Heimlich (above right) – Nick Heimlich, Assistant Chief for the Springfield Fire Department, joined the WUSSes and gave an educational presentation on medical concerns in the outdoors. Mr. Heimlich focused on specific caving related concerns such as hypothermia, splinting, and patient assessment. Upon hearing Mr. Heimlich's presentation many WUSSes have vowed to become safer cavers. We give our gratitude to Mr. Heimlich and hope he will join us again for a more in depth presentation. Photo by H. Hobbs III.

Zaleha (right) – Dr. Mike Zaleha, associate professor of Geology, is seen giving a lecture on Electrical resistivity ground imaging (ERGI) and its importance to locating voids (caves) in the Earth. Dr. Zaleha gave a wonderful presentation to the WUSSes in April of last year and we hope he is successful in his research. See Pholeos Volume 23 (1,2) for a complete article on ERGI. Photo by H. Hobbs III.

INFORMATION FOR CONTRIBUTORS

PHOLEOS

Journal Of The Wittenberg University Speleological Society

EDITORIAL POLICY: Manuscripts treating basic research in any aspect of speleology will be considered for publication. They must not have been previously published, accepted for publications, or be under consideration elsewhere.

All manuscripts are to be in English. Metric and Celsius units must be used, and SI units are preferred. The CBE Style Manual, the Handbook for Authors of Papers of the American Chemical Society, and Webster's Ninth Collegiate Dictionary are useful guides for matters of form and spelling.

The original of the manuscript must be typed double-spaced on one side of white bond paper approximately 8.5 x 11 inches, leaving margins of one inch. Use triple-space above headings.

The most effective way to submit a manuscript is as an attachment to an e-mail message sent to the editor. A second approach is to submit three (3) hard copies of the manuscript, figures, and tables along with a CD-ROM of the manuscript, figures, and tables in separate files.

Number pages consecutively at the top right-hand corner. Underline scientific names of genera and lower categories. Acknowledgments should be on a separate, double-spaced page. Each figure and table must be referred to in the text. Text references are by author, followed by year of publication.

The sequence of material in the manuscript should be as follows.

1. The *title* page should include the title, author's name, affiliation, WUSS and NSS membership number, and mailing address.
2. The *abstract* should not exceed one double-spaced page. It should contain a summary of significant findings and note the implications of these findings.
3. The *introduction*.
4. *Methods and materials.*
5. *Results.*
6. *Discussion*.
7. *Literature Cited*. List all publications referred to in the manuscript alphabetically by first author on a separate sheet of paper (double-spaced). Each citation must be complete, according to the following examples:

   Journal Article:

   Peck, S.B 1974. The food of the salamanders *Eurycea lucifugá* and *Plethodon glutinosus* in caves. NSS Bulletin, 36(4): 7-10.

   Book:

   Moore, G.W., and N. Sullivan. 1997. Speleology: Caves and the cave environment. St. Louis, Missouri: Cave Books.

   Chapter:

   Hobbs, H.H. 1992. Caves and springs. *IN*, C.T. Hackney, S.M. Adams, and W.A. Martin (eds.), Biodiversity of Southeastern United States/Aquatic Communities. John Wiley & Sons, pp. 59-131.

8. *Figures and Tables s*hould be self-explanatory, with captions of tables placed above and those for figures situated beneath. Each table and figure should start on a separate sheet. Headings and format should be consistent. Originals for all figures and tables should be submitted with the manuscript or, if in electronic form, should have a minimum resolution of 300 dpi.

Address all manuscripts and correspondence concerning editorial matters to

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View of the "eyes" from the bottom of Mossy Pit Cave, Carter County, Kentucky.

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