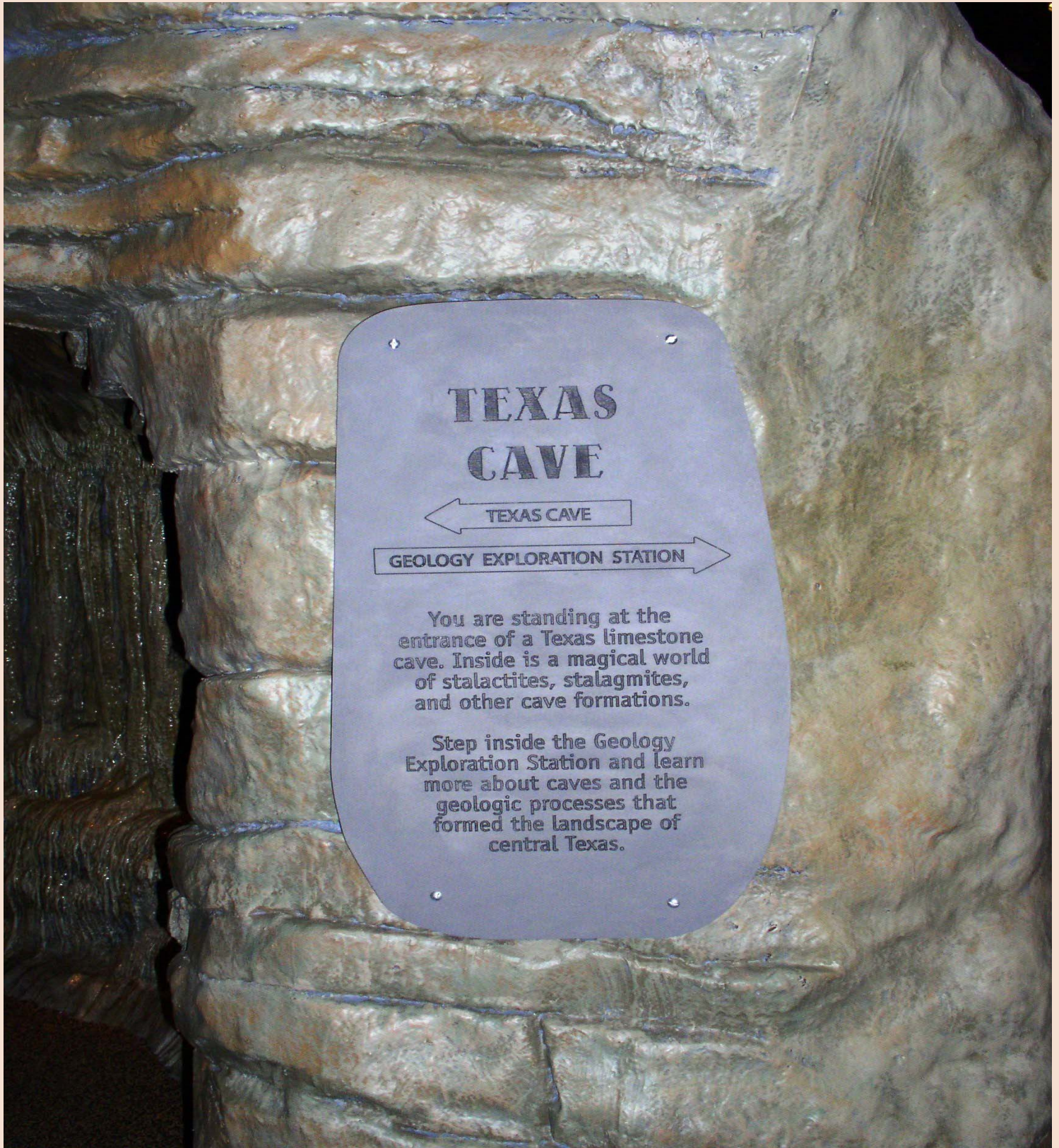


# THE MAVERICK BULL

The Newsletter of the Maverick Grotto Volume 18 Issue 7 July, 2005





## Maverick Grotto Information

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*The Maverick Bull* is the monthly newsletter of The Maverick Grotto, an internal organization of The National Speleological Society (NSS G-322). The editor invites all individuals and other grottos to submit articles, news, maps, cartoons, art and photographs. If the material is to be returned, a self-addressed stamped envelope should accompany it.

**Reprinting Articles:** Internal organizations of The National Speleological Society may reprint any item (unless copyrights belong to the author as stated in the byline) first appearing in *The Maverick Bull* if proper credit is given and a complete copy of the publication is delivered to the editor at the time of publication. Other organizations should contact the editor of *The Maverick Bull* at the address herein.

**Exchanges:** The Maverick Grotto will exchange newsletters with other grottos. Contact the editor.

**Complementary Newsletters:** The Maverick Grotto will provide complementary newsletters to persons or organizations that provide cave access (i.e. landowners) or otherwise provide assistance to cavers. The Maverick Grotto will provide one free issue to persons interested in becoming members.

**Subscription Rates:** Subscription rates are \$15.00 per year for non-members and free for members.

**Membership Policy:** Any individual with interests, beliefs and actions consistent with the purposes of The Maverick Grotto and The National Speleological Society is eligible for membership. Acceptance of new members is based on payment of dues and a mandatory three trip requirement with at least three different grotto members. These three members shall act as sponsors. At least one sponsor must attend the meeting at which the membership vote is taken. A two-thirds majority vote of the members present will be required for acceptance.

**Meetings:** Meetings are held the second Tuesday of each month at Bodacious BBQ, 1206 E. Division St., Arlington. The time is 7 p.m., and the food is good.

**Library:** Support your Grotto Library. Dennis Welch will be accepting books and magazines on cave-related topics, copies of homemade cave videos, etc. for our library. We wish to thank Dennis for his efforts to bring and set up the Grotto Library.

## Photos & Map Credits

**Bill Steele**—Cover (story pg 9), pages 8 (1) and 9 (2), back cover

**Ed Goff**—Pages 5 (1), 6 (2) - Story Page 5

Sharon Mastbrook-Page 3 (2) - see 6/14 meeting minutes

**Visit Our NSS Award-Winning Web Site!** Butch has been hard at work constructing the grotto web site and keeping it up-to-date. You'll find information about getting into caving, trip photos and the PDF version of this newsletter (with color photos!): Also, Butch has also done a wonderful job putting all the previous newsletters on the web site. Be sure and check it out.

[Http://www.maverickgrotto.org](http://www.maverickgrotto.org)

**Cave Rescue:** Call collect: (512) 686-0234

**Next meeting, July 12th, 7:00 pm**

**Bodacious BBQ**

**1206 E Division St.**

**Arlington, TX. 76011**

**(817) 860-4248**

**Program:** The July program will be a video taped at Fence Line Fissure in San Saba County. Butch Fralia and Dale Ellison made the video in the late 1980's complete with background music and narration. It's been digitized and updated with titles.

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## Minutes: May 10, 2005

Submitted by Kris Megahan

The May minutes were a little late for the June issue but here they are for history's sake!

Ed Goff called the meeting to order 7:23 pm.

Treasurer Sharon Mastbrook was unable to attend but sent word through Butch Fralia that the Grotto has money.

Butch Fralia announced that the Maverick Grotto website had run out of spaces because of over 100 new newsletters added making it necessary to increase from 250MB to 750MB, raising the cost of the website from \$107 annually to \$161 annually. Pete Lindsley motioned to accept the new space allocation and cost, Bill Tucker seconded and the motion carried. The new rate wont be in effect until November.

Old Business:

1. Butch Fralia will have the remaining newsletters available for scanning by the last of May.
2. The T-shirts arrived! A significant part of the meeting was spent with people collecting their T-Shirts and Butch Fralia collecting from those who hadn't paid.
3. Dennis Welch asked Diana Tomchick about newsletter exchanges.

New Business:

1. Kristopher Megahan volunteered to do an exchange newsletter review.
2. No new membership applications taken this month.
3. June 18th weekend taken for Deep and Pumpkin Caves, Ed Goff will e-mail grotto with an alternative.

Trip Reports:

1. Diana went on a trip to Cooke County's first cave. It barely meets the qualifications for a cave at five meters.
2. Kristopher Megahan, Tammy Cox and R.D. Milhollin attended a guads restoration trip.

Announcements:

1. Dennis Welch announced a trip to Whirlpool Cave.
2. Dennis Welch announced a guads trip with multiple permits from May 30, through June 13th.
3. Ed Goff announced a trip to Mexico for the first weekend in July. Contact Ed for dates.
4. Bill Steele selling The Devil's Sinkhole DVD. Dan Smith motioned for the Grotto to by a library copy. Motion seconded by Tammy Cox and the motion carried.

## Minutes: June 14, 2005

Submitted by Sharon Mastbrook

There were 8 visitors, three charter members, two grotto founders and four ex-chairmen present at the meeting.

Visitors:

Jim and Martha McLain from Zuni, Arizona  
Sheree McMahan and friend from Wichita Falls, Tx  
Ray ? From jolly old England.  
Charles and Tammy Goldsmith  
Cheryl Hammons, Mansfield Texas.

Dale Ellison, Chad Fenner, Butch Fralia and Mike Anderson were the ex-chairmen. Russell Hill, Sharon Darnell and Arlene Heinz were the charter



**Sharon Darnell visited the 6/14/05 meeting.  
A flashback from our past!**

members while Butch Fralia and Dale Ellison were the founding members.

Officer's Reports: Ed Goff is out. Treasurer Report: We have money. T-Shirt \$ will be deposited in the next week.

There was no Old Business.

New Business:

March 25, 2006, weekend will be a NSS BOG meeting that Bill Steele is proposing to be held in Irving. Bill presented the Grotto an opportunity to participate and co-sponsor with DFW and CTG (they agreed the following night). The participation will consist of picking people up from the airport, taking to a party at Bill and Diana's home and having some of them stay in our homes. Bill made the motion which was seconded by Dennis Welch, a third by Mark Gee and the motioned carried.

Butch is helping the DFW Grotto redesign their website. He's offered to help the Cowtown Grotto get their website online by consulting with them to design a layout, finding a hosting ISP, etc.



**Newbies, Oldies and a Brit!  
A full house meeting on 6/14**

Mark made a call to the membership to provide the July program. Butch offered to do the program.

Butch made a call to the membership to submit pictures for the website. He gave an update on the status of the website regarding the new material uploaded and the number of hits, etc.

Trip Reports:

Bill and Francie Tucker and Dennis and Sharon Welch went to New Mexico to help with a restoration project. They also visited several caves in the area.

Bill Steele, Diana Tomchick, & Ed Goff went to Bear Hollow Rift, Stephen's Gap, and Jess Elliott Cave.

Meeting adjourned at 8:57 p.m.

## Caving Events Calendar

**July until Oct Evening Bat Flight Tours, Devil's Sinkhole State Natural Area (Rocksprings):** Every Wednesday through Sunday the Devil's Sinkhole Society leads tours. Peer down into the depths of Texas and observe up to 3 million bats merge. A short program will be given on the Devil's Sinkhole and bats. Visitors are shuttled in a tour bus from Rocksprings Visitor Center to the site. Call for times; fees \$10 adults, \$8 senior citizens, \$6 children 12 and under; reservations required. (830) 683-BATS (2287), (830) 683-3762.

**July until Oct Bat Flights at Old Tunnel Wildlife Management Area (Fredericksburg):** Observe an estimated 3 million Mexican Free-tailed bats and 1,000-3,000 Cave Myotis emerge from this abandoned railroad tunnel in the evening. All nightly programs begin one hour prior to estimated bat emergence times. These vary during the year so call ahead for times [(830) 367-7923]; seating for lower viewing area programs is on a first-come, first-served basis. **Contact:** Amy Sugeno (830) 990-2860. **Info:** [http://www.tpwd.state.tx.us/wma/find\\_a\\_wma/list/?id=17](http://www.tpwd.state.tx.us/wma/find_a_wma/list/?id=17)

**Jul 13 Texas Speleological Survey Work Session (Austin):** Held at the TSS offices in Austin from 5:00 to 8:00 p.m. Come help with the organization of Texas cave information. **Contacts:** Jim Kennedy (512) 663-2287 [jkenedy@batcon.org](mailto:jkenedy@batcon.org) Ron Ralph [ronralph@austin.rr.com](mailto:ronralph@austin.rr.com)

**July 16-17 GypKaP (Carlsbad, NM):** Long-running cave survey project in the gypsum plain of southern New Mexico. **Contact:** Blake Jordan (505) 260-1096 [blanvoid@comcast.net](mailto:blanvoid@comcast.net)

**July 30-31 High Guads Restoration Project (Carlsbad, NM):**

**August 1-5, 2005 - Mammoth Cave Restoration Camp -** Mammoth Cave National Park. I think it will be a very interesting year and I hope to see many of you at the camps. For more information visit the website: <http://mcnprestation.com/rfc.html>

**August 5-7, 2005 - 52nd Annual Cave Capers!** - Crawford County 4H Fairground, near Marengo, IN. In addition to some of the finest caving in Indiana we will have a stellar lineup of events for your enjoyment. Friday we will have a few cave trips and live music. Saturday after caving you can enjoy the low dough cookout, followed by Mark Minton speaking about the US Deep Cave Team's recent expedition to Mexico. Then the highlight of the evening, a performance by the ever popular Terminal Syphons. Check our web site at [www.cavecapers.com](http://www.cavecapers.com) for more information. Or contact Bambi dunlap at [bambi.deer@juno.com](mailto:bambi.deer@juno.com)

**August 13-14 Manhole Dig (Carlsbad, NM):** On-going dig project on BLM land. **Contact:** Stephen Fleming [swcaver@caverns.com](mailto:swcaver@caverns.com)

**August 14 Bat Flights at Stuart Bat Cave, Kickapoo Caverns State Park (Bracketville)** Observe an estimated 500,000 bats emerge from Stuart Bat Cave in the evening. A program will be given regarding bats, the environment and the resources of the park. Call for times; fees \$5 per person; reservations required (830) 563-2342

**August 14-19, 2005 - Bat Conservation and Management Workshops -** Barre, Pennsylvania. For more details visit the BCI website <http://www.batcon.org> or contact Kari Gaukler at [kgaukler@batcon.org](mailto:kgaukler@batcon.org).

**August 20-21 GypKaP (Carlsbad, NM):** Long-running cave survey project in the gypsum plain of southern New Mexico. **Contact:** Blake Jordan (505) 260-1096 [blanvoid@comcast.net](mailto:blanvoid@comcast.net)

**August 21-28 14th International Congress of Speleology (Athens, Greece):** All subjects and activities of interest to caves and karst will be covered, including paper presentations, exploration reports, caving techniques, speleo equipment, films, media, art, and more. The Union Internationale de Speleologie hosts an International Congress once every four years. **Info:** [www.14ics-athens2005.gr](http://www.14ics-athens2005.gr)

**August 27, 2005 TSS Quarterly Board Meeting and Work Session:** Beginning at 10:30, the board of directors will meet at building 18A of the UT Pickle Research campus, Austin, TX. Afterward there will be a work session. If you haven't been to the office before, this would be a good chance to get familiar with the type of data maintained in the TSS files. **Contact:** Jim Kennedy at: [jkenedy@batcon.org](mailto:jkenedy@batcon.org) or Butch Fralia at: [bfralia@maverickgrotto.org](mailto:bfralia@maverickgrotto.org)

**September 1-5, 2005 Old Timers Reunion.** Held in West Virginia every Labor Day weekend. This is the largest congregation of cavers in the world. There is no pretense of science or cave exploration; just lots of partying and socializing. There are many easily accessible caves nearby. Daily, WV (Randolph County) . . . <http://www.otr.org>

**September 10-11 Manhole Dig (Carlsbad, NM):** On-going dig project on BLM land. **Contact:** Stephen Fleming [swcaver@caverns.com](mailto:swcaver@caverns.com)

**September 10 Bat Flights at Stuart Bat Cave, Kickapoo Caverns State Park (Bracketville)**

**September 16-18, 2005 - 41st Annual Hodag Hunt** - sponsored by the Wisconsin Speleological Society with Crystal Cave, Spring Valley, Wisconsin. Event includes guided wild cave trips and wild tours through the off-trail section of Crystal Cave, one of Wisconsin's longest commercial caves. Catered breakfast and dinner, guest speakers will hold a mini geology/biology seminar, fund raising auction and door prizes. For more information please contact Dawn Ryan: [airsr@hotmail.com](mailto:airsr@hotmail.com) or 815-260-3454

**September 24-28, 2005 - Karst 2005** - DoubleTree Hotel, San Antonio, Texas Tenth Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst Sponsored by the Geo-Institute of ASCE, P.E. Lamoreaux & Associates, Inc., Edwards Aquifer Authority, and co-sponsored by Southwest Research Institute. For more information visit the website: <http://www.asce.org/conferences/karst2005>

**September 24-25, 2005 High Guads Restoration Project (Carlsbad, NM):**

**October 6-9, 2005 TAG Fall Cave-In - Lookout Mountain, Georgia.** The cavers of Tennessee, Alabama, and Georgia get together in early October for a weekend of parties, speleo-competitions, and lots of "pit bouncing." <http://www.tagfallcavein.org/homex.html>

## July Guest Editor

It's been a couple of years since I've been blessed with being the guest editor. Tammy and Lex scheduled a family vacation just in time to get around doing a newsletter. I gracefully agreed to take care of it this month. Don't think there was any coercion involved, I mistakenly offered once upon a time so she remembered and took me up on it.

Now I don't mind doing an occasional newsletter, it can be fun after you haven't done it in awhile. I told Tammy I was concerned about keeping it up to her high standards. After a little thought I want it to be good but not good enough to start a draft Butch movement when Tammy eventually gets burned out which I hope won't be for a long time.

I put out a plea for materials on the Grotto mailing list and I'm gratified at the response. Of course I only have one of the



promised articles so we'll see how that goes.  
All that said, here we go!

Butch Fralia

## Dining while Camping effortlessly

By Dale Ellison, Maverick Grotto  
Thecaveman@comcast.net

If your an outdoor chef and enjoy the challenges of cooking while camping in the "wild" by bringing everything to the camp site, this article may not be for you. If you enjoy the outdoors but don't look forward to the ordeal of preparing a meal at the campsite, this information is just for you.

Caving and camping for about 25 years, I've seen everything in the way foods at campsites. Only rarely will a "to die for" restaurant be near enough to camp that food preparation is needless. Caving in the town of Ft. Stockton, while exploring Comanche Springs, which trends under the old Ft. Stockton, a National Historical Site, is such a place. Caving in the neighborhoods of San Antonio is another place that good food is readily available without much effort. But, if your the designated camp cook and expected to bring raw foods, utensils, pot and pans, plates and silver, and supplies to do the cleanup, you'd likely wish for food just as good but without any effort. I have a secret to pass on to you. It is possible to dine at the campsite on foods just like eating at your favorite neighborhood restaurant.

But before I give you the secret, remembering where you've been can help you appreciate the great results of camp food. My first camping trip was supplied solely from the camping supplies department from K-Mart. I purchased all of the necessary items; tent, sleeping bag, canteen, a Sterno burner and some dehydrated food, yummy! Spending a few days canoeing down the Eleven Points River in Northern Arkansas revealed the weakness in my fast preparations. My canteen of water ran out the first day, the river water substituted clean water for the dehydrated food. Boiling water over a Sterno tablet takes forever. Since I was unprepared to demonstrate my experience to the others, I camped away from the main group. After I had my cold Sterno powdered food, I joined the others to find hot baked potatoes with all the trimmings, sinfully beautiful bronze steaks dripping with butter; well you get the idea. I was offered their leftovers, which was immensely tempting. I heroically declined. I froze that night although I slept in all my clothes including my shoes. The next day on the river, I graciously accepted a few grilled weenies that kept me from perishing. Since that memorable experience, I packed skillets, steaks kept in the ice chest that turned the ice water pink, salt, pepper, sticks of butter, tongs, forks, knives, plates, bowls, dish washing pads and dish soap. That's not all of the supplies but like here it would take up more space than my caving equipment. Although the food was great, the few hours of preparation after an exhausting day of caving was taking its toll. I resorted to the canned potted meats, chips or any other faster compact food I could find.

Finally, I tried something that proved to be the breakthrough. I found "Seal-a-meal". A Seal-a-meal is a system whereby food is

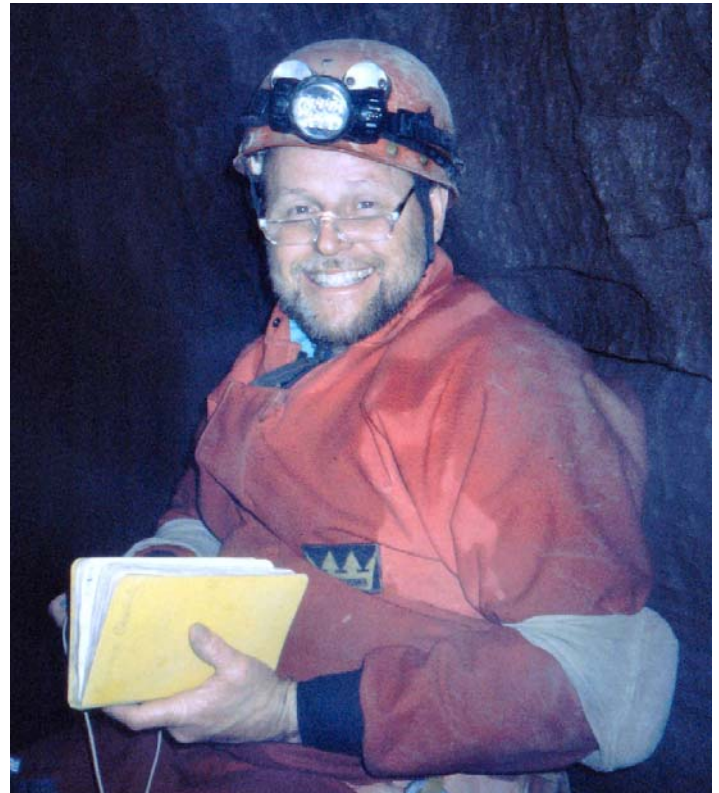
prepared or purchased at your favorite restaurant and placed into Seal-a-meal "boilable" bags. Now, I only took a pot to boil water in, I'd place the bags into the boiling water and behold, I was now eating my favorite BBQ dinner at campsite watching others enjoy their canned potted meats, dehydrated Sterno heated foods. Scrambled eggs and bacon will last from Thursday night to Sunday morning and they're wonderful for breakfast. I have no dishes to wash and my plates, forks and bags can go into the campfire. So, there is the secret, the boilable sealed pouch. Subway sandwiches are just like fresh made, just avoid liquids like dressings and avoid tomatoes and "wet" items, as they will make the bread soggy. Try it and treat yourself to a great camp meal with no effort but feel sorry for the beginning campers.

## TAG Caving

### Memorial Day Weekend, 2005

by Bill Steele

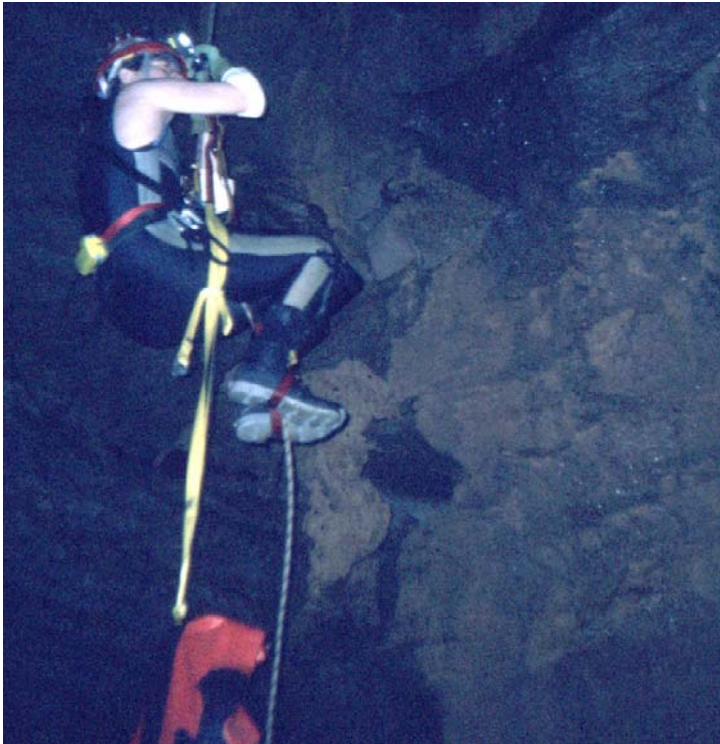
Our main goal in going all the way to Alabama over the Me-



Jimmy Smith a man of the book

memorial Day weekend was to assist my friend Jim Smith in surveying Bear Hollow Rift.

I'd been to this fairly difficult, 250 foot deep cave before, in January 2004. That time I had a business trip to Chattanooga. Jim, who lives in Atlanta, picked me up when I was done working at 1:30 on Saturday. We did some rugged 4-wheel driving up a mountain in northeast Alabama, then an hour-long hike through



**Diana Tomchick**

the winter woods to the entrance. It was just the two of us. The cave was already rigged except for the entrance pit. The third drop in was a hard one. There's a tight squeeze at the top of a 40-foot drop, and a bolt out over the free fall. A cows-tail needs to be on the rope, which is rigged horizontally through the squeeze, then, hanging from the cows-tail, a person's rappelling rack is clipped on the rope. An etrier is hanging from the bolt in which to step up and remove the cows-tail. It was tight, but we both did it okay, and we're bigger guys than Diana Tomchick, Tammy Cox or Ed Goff who went over Memorial Day.

Jim and I surveyed 1,100 feet and set 51 stations on our January 2004 trip to Bear Hollow Rift. When we exited the cave at 2:30 a.m. and it was 17 degrees outside. I peeled off my wetsuit and stood in the pale moonlight with a column of steam rising off my body, and announced, "Look Jim, I'm nature boy!" We got back to the truck at 4:00 a.m., and cooked supper.

This Memorial day, the four of us drove to Alabama in Diana's Toyota Tundra, The Beast. We went by way of I20 through Mississippi to Birmingham, then northeast to Chattanooga. There we found a late night grocery, and found Jim at his campsite around 2:00 a.m.

In the morning we tried to drive up the mountain like Jim and I had the year before, but the hunting club which leases the mountaintop had it gated. We hiked up the steep, eroded dirt road, and then bushwhacked through the woods to the entrance in about three hours. There we dressed in wetsuits, rigged the entrance rope, and headed underground.

Jim and Ed were already down the third, challenging drop when Tammy, Diana and I got to the top. Tammy was clipped in and trying it, but had mistakenly approached it headfirst, not being experienced at doing a tight squeeze with a cows-tail on, then

switching to rappel. She came back out and yielded to Diana to watch her do it. Diana popped through it smoothly, but clipped her micro-rack on too low and couldn't get her foot in the etrier. She promptly clipped her frog system's Jammer and got her cows-tail off.

Tammy was hesitant. She sorta, kinda gave it another shot, but the spot worried her and she decided that she didn't want to go on. This was the cave we had driven 900 miles to do, so I turned on all the charm and reasoning I could muster, all to no avail. I called down the pit to the others that Tammy wanted to leave the cave and I would leave with her and hike down the mountain to the truck to wait. I didn't want her to have to wait by herself and probably get cold, and the others didn't either. They came out of the cave and we aborted the trip.

To get back to the truck we headed straight down the mountain. It was rough and we got cliffed-out, but eventually found a way down stair-stepping bands of cliffs, all the while looking where we put our feet and hands due to the stern warning and scary stories about near misses from poisonous snakes from Jim.

At the bottom of the mountain we saw Jess Elliott Cave, a 4 1/2 mile long cave that Jim thinks is where the water in Bear Hollow



**Tammy Cox and Gear**

Rift eventually goes. We saw the cave's largest trunk passages, and some prehistoric petroglyphs scratched in the ceiling.

Back at our camp we had a little party, highlighted by some delicious venison chili Jim had cooked. We were honored that he fed us the first deer he had ever killed.

On Monday we did a 60-foot pit, then drove across Jackson County (the county with the most caves of any U.S. county – over 8,000) to do Stephen's Gap. I'd heard of this pit for many years, but had never done it before. I'm glad that I have now.



It's one of the prettiest of them all. One hundred-fifty seven feet deep, this open-air pit has a waterfall sprinkling down the opposite side, jade-colored moss behind it, and gloomy-gray sheer walls. Stephen's Gap has a second entrance you can walk out, so Tammy and I opted for a through-trip while Diana and Ed frogged back up the free-hanging rope.

Jim took us to the cavers' campground on a hilltop at the edge of Stevensville, Alabama. After we set up camp and started cooking supper a couple of vehicles pulled in. Figuring they were cavers too, I walked toward them through the trees and got alarmed at the pit bull with spiked collar walking directly toward me. Calling the dog was a Mohawk-haired, well-tattooed man, yelling, "He won't bite you!" which wasn't much comfort. It was a caver named Chuck Constable, and the other guy was Dirk Siron, cavers from Huntsville. We ended up delaying supper and watching a DVD of a trip they had taken to Mt. Thor on Baffin Island in the Northwest Territories of Canada, to do a 4,000 foot rappel. They didn't succeed due to the weather turning bad – real bad and cold. We learned about Mountain Dew LIVE WIRE! From them, a high energy drink laced with lots of corn syrup, and seemingly going well with EXTREME SPORTS!, Dude.

On Tuesday morning we headed west by way of Nashville. I knew there's a 1 to 1 replica of the Parthenon, the original being on top of the Acropolis in Athens, Greece. The Parthenon replica was built over 100 years ago and is made of concrete made to look like the original marble. Housed in Nashville's Parthenon is a statue of the Goddess Athena. The original one in Athens was made of powdered ivory and gold mixed into a mortar, and Nashville's looks like that.

We got back to the Metroplex at 9:30 p.m., having driven about 2,000 miles and entering four "A" caves, the "A" in TAG, or Tennessee, Alabama and Georgia, where the big ones are.

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## Cavin' in San Saba

By Milo Marks

Ed. – I got a brief e-mail from Milo Marks about his trip to San Saba County over the weekend of 6/25-6/26. He said to use the information if I could make an interesting story out of it. It sounded interesting to me so here it is:

My GPS didn't work so I didn't take any readings. I found one new entrance and entered three caves total. I crawled down into one entrance but quickly retreated when greeted by three raccoons. They tend to be testy when they don't want visitors. I entered one vertical cave but again found three more raccoons. Entered a third cave that was vertical but it quickly became to tight to continue.

I didn't take a tent so I made a bedroll on the ground. The bugs tried to eat me alive so I ended up tying a shirt around my head to keep them away. I finally got to sleep but was awakened when someone shot a gun somewhere close to my campsite. Soon after, someone drove around my bedroll in a vehicle.

The next day the landowner told me he forgot to tell hunters on the property he was there. They were coon hunting. Never a dull moment in San Saba!

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## GPS Revisited - 2

By Butch Fralia

It's been awhile since I've written about GPS so maybe it's time for a refresher. GPS receivers have become very common so it's easy to record the location of a favorite cave, spring, campsite or ?. Cavers who haven't used GPS before are buying them and there are things they need to know. I'm going to ramble through a couple points to ponder and what ever else comes to mind!

As long as it's related to your particular GPS, all you need is the recorded location under some name that makes sense to you. I'd recommend you use names that make sense and not just a sequential number the GPS supplies. Most of the newer GPS receivers will allow a descriptive name like Gorman Cave or something of that nature. I guarantee that in a couple of months you wont remember what 001 or 002 was.

What happens if you want to share your data with someone else? Do you know what a datum is? Do you know where to find it? Do you know what datum your buddy's GPS is set to? Why is it important?

Christopher Columbus was almost right; the world isn't flat but it's not quite round either. It's a little oblong, ovoid or one of those fancy terms. To mathematically describe the earth, geographers came up with a mathematical equation called a datum. There are a bunch of these around, specialized for the part of the world that you're in. Most GPS receivers can be set for over 120 different datum.

There are three datum that we as cavers in the United States are concerned with. The first is NAD27-Conus, the North American Datum of 1927, optimized for the Continental United States. The Second is NAD83 or the North American Datum of 1983. The third is WGS84 or World Geodetic Standard of 1984. NAD83 and WGS84 are the same thing, NAD83 was adopted as the world standard and renamed WGS84. In a sense that's only two datum but you'll find maps marked in NAD83 and WGS84 so you need to be aware of both.

You should know the datum your GPS is set to because of maps. Maps don't all use the same datum and if you calculate a location from a map and enter it into your GPS with it set to a different datum, you wont be where you think you are. For instance, a USGS topographic map uses the NAD27-Conus datum. If you calculate a point on the map and enter it into your GPS with it's datum set to WGS84, you'll be about 250 meters off to the north and about 60 meters off to the east. That's about a football field, a significant distance in the hill country where you could be in the wrong canyon because of the error.

The newer USGS DOQ maps (Digital Ortho Quad) are calibrated in NAD83. Most commercial maps like Street Atlas or TopoUSA are calibrated in WGS84. For whatever reason, the commercial map people like DeLorme don't like to publicize the datum of their maps. I had to send them an e-mail to find out! I guess their logic is they think about people LOOKING at maps for directions and not navigating with them using GPS. A GPS interface in the map package was sort of an after thought.

Internally, GPS stores its information in WGS84 but displays it through a pretty exotic mathematical equation in whatever datum is set up on the menu system. If the GPS datum is set to WGS84 and you put in an NAD27 location, it goes straight into memory as a WGS84 location. If you switch the display to NAD27-Conus, it converts the location through the algorithm and you're really lost. If you set the display to NAD27-Conus when you enter the waypoint, the GPS converts it for storage to WGS84. Whatever datum you use from that point will put you where you think you are and you'll go where you want to go.

I won't try to describe every GPS but somewhere in the menu system, you can set the datum. If you're going to share location data with a friend, it's important to know which datum both GPS receivers are set to. For some people this is a redundant discussion but it keeps coming up over and over again as new GPS users come on line.

There are a lot of GPS receivers on the market now with price ranges between cheap and very expensive! Most all of them have 12 channel receivers and all have about the same accuracy. Most GPS receivers will store 500 locations though I've seen some really cheap ones that only store 100. If the accuracy is the same and storage is the same then you can start looking for the additional features you want.

Personally I like a GPS that will interface to my computer so I can back up the data on my GPS. I have accumulated a large collection of data so there are times when I have to clear all the data out of my GPS and reload it for some other area. For instance, there are about 384 location points at Colorado Bend State Park. That doesn't leave much room for other data. I've been tracking down the route of the old Scholten Railroad that once ran on the park. I have to make a decision on whether I'm going to work on the railroad or cave locations because I can't have all of both in my GPS at the same time. Fortunately I have a laptop that I can keep both files on and can clear and reload during a trip if there's a reason.

WAAS, the Wide Area Augmentation System is a neat feature when it works. There are a number of ground monitoring stations at precisely surveyed locations that are connected to a super computer somewhere in California. This computer crunches the numbers and sends them up to a couple of satellites in fixed locations that broadcast corrections that are picked up by GPS receivers. If you can get a WAAS lock, your GPS accuracy will probably be about 8' or 2-1/2 meters. That's relative to the face of the earth so it's not bad at all! There's a problem! The satellites are out over the Pacific and Atlantic oceans rather than somewhere above you. I guess it's great for an airplane but right now has its limitations on the ground. About the only place it really works is when you're on top of a hill! It will probably get better but right now isn't very reliable for the intrepid Texas ridge walker. Hopefully there will eventually be a satellite centralized over the center of the United States, looking down at me while I'm in the brush and valleys.

A built in compass is a great feature! If you're directionally impaired, you should probably be carrying a compass anyway. However, if you're set a go to waypoint in your GPS, quite often it will give you a direction to the waypoint. If you're hiking through cactus and brush, it's a hassle to look at two instruments. Now a built in compass is available in many GPS receivers and it's a very nice feature, not free but nice!

Built in and loadable maps are an available feature now. My current GPS is a Garmin Etrex Vista with down loadable map capability. I got it because I wanted WAAS and a built in compass. It turned out the only model with both was of course the most expensive one that included a US base map but had the capability of downloading maps. The Gotcha was the receiver didn't come with computer interface software so you had to buy one of the \$100.00 map packages to get that. I selected the topographic package that also has highways, streets and FWD trails in it. The topographic grid is limited compared to a regular topographic map. I didn't think I'd care that much about the maps but now I've become addicted to them. I'm impressed with the large area of maps that I can store in the GPS. It pretty well covers my favorite caving areas and I'm glad I got that feature!

I was fortunate enough to have the opportunity to work with GPS before the personal GPS receivers became available. The Texas A&M Geography department loaned the CBSP project two Trimble Technology post processing GPS receivers to take cave locations with. These things were huge with tripod-mounted antennas. One receiver was left in a fixed location while the other was the rover. The receivers were taken back to A&M, the data dumped and post processed. We used them on several trips but only received location data back from one trip for reasons I won't go into. The significant thing is that we might have to wait 30 minutes to get three satellites in view at the same time so we could take a coordinate reading.

Thinking back on that, a question I often find myself asking is whether the GPS system has gotten better or worse. For the most part the answer is yes. When I check the satellite display, I always see at least six satellites in view at a minimum and on a few rare occasions have actually seen twelve! The Selective Availability system was turned off so the typical accuracy for a twelve-channel GPS receiver is usually within five meters. Occasionally when I'm in the right location and WAAS works I can get 2-1/2 meter accuracy (maybe better but that's what the GPS says).

While the system has gotten better, I'm not always sure about the GPS receivers. As already mentioned, I've got a Garmin Etrex Vista receiver. I bought one of the first twelve-channel re-



**Baylor University—Mayborn Museum Complex  
Waco**





**Formations in Waco's artificial cave!**

ceivers on the market in the Garmin 12 XL. Before that I had a four channel Magellan 2000. The Garmin 12 XL was a quantum leap above the old Magellan, not because Magellan is a bad brand but because of the old receiver technology. Magellan builds many fine GPS receivers and markets them today. The move to make things smaller isn't always a good thing. My Garmin 12 XL is larger than my Etrex and doesn't have as many features. Being larger however it has a much more sensitive antenna system that works in the woods and on cloudy days when the Etrex shuts down. In reducing the size, the antenna sensitivity was reduced making it harder to use in some areas.

The definitive answer to whether GPS has gotten better is yes and no! I guess that's the proverbial definite maybe! The overall GPS system is light years ahead of where it was when I first saw it. The GPS receiver features are light years ahead of where they were when I first saw them. The receiver sensitivity isn't quite as good as it has been in the past. So you win some and lose some.

Conclusions: If you haven't used GPS, get one and learn how to use it, you won't go back to not having one. Learn how to



**Formations in Waco's artificial cave!**

find the datum your GPS receiver and how to change it if you need to (RTFM). All GPS receivers without WAAS have about the same accuracy so you can select a GPS receiver based on your pocket book and the features you want. Don't depend on WAAS to be there all the time for those very accurate measurements. Enjoy your GPS and send your location data to me for inclusion in the TSS database!

## Waco's Artificial Cave

by Bill Steele

Sometime when you're driving through Waco, it's worth a stop to see the artificial cave in the Jeanes Discovery Center, which is part of Baylor University's Mayborn Museum Complex. If you've noticed the Texas Ranger Museum along I35, the Jeanes Discovery Center is about a half mile behind it, in the row of museums that make up the Mayborn Museum Complex.

See: [http://www.baylor.edu/arts\\_sciences/index.php?id=25301](http://www.baylor.edu/arts_sciences/index.php?id=25301)

and:

<http://www.baylor.edu/mayborn/>


The museum is free from 4:00 p.m. to 5:00 p.m. on Sunday afternoons, perfect for coinciding with driving through Waco from a caving trip in the Austin area. Other times it only costs \$6 for adults.

### Museum Hours

Monday	10 am - 5 pm
Tuesday	10 am - 5 pm
Wednesday	10 am - 5 pm
Thursday	10 am - 8 pm
Friday	10 am - 5 pm
Saturday	10 am - 5 pm
Sunday	1 pm - 5 pm

## • HOW CAVES FORM •

The Processes Involved in the Formation of Caves




Karst is a geologic term used to describe a landscape that develops on or in water-soluble rock. It is characterized by the presence of sinkholes, caves, springs, and disappearing and underground streams.

The most common types of caves form in limestone or gypsum. They are called solution karst caves.


There are two types of solution karst caves: vadose caves & phreatic caves.

**Q.** What type of cave do you think is in the adjoining room?


*How are these caves different?*



**Vadose**  
Vadose caves form above the water table. These are dry caves, though there may be streams, pools and lakes of water.



**Phreatic**  
Phreatic caves are those formed below the water table, completely underwater.

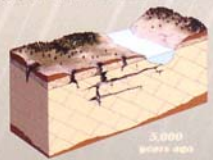


**How do caves form?**  
Caves form very slowly over thousands of years. It all begins with a drop of rain.


Falling rain absorbs carbon dioxide from the atmosphere. The rain gathers additional carbon dioxide as it moves through the soil. The combination of water and carbon dioxide produces a weak carbonic acid.

$$H_2O + CO_2 = H_2CO_3$$

(water + carbon dioxide = carbonic acid)



3,000 years ago



Today

As this acid seeps through cracks and crevices in the limestone, it begins to dissolve the rock, forming larger cavities and channels and finally large tunnels and chambers.

Part of the Artificial Cave exhibit at Waco Texas  
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