The Central Connecticut Grotto (CCG) is a local chapter of the National Speleological Society (NSS) dedicated to the exploration, scientific study, and conservation of caves and all aspects of the underground environment, as well as promoting a spirit of camaraderie and fellowship among cavers. Membership is open to anyone who shares these interests. Regular membership dues are $5.00 per year. Non-voting youth or full-time student membership dues are $2.00 per year. Institutional membership is free. Please visit www.caves.org/grotto/ccg/join.htm for additional membership information. Grotto meetings, consisting of a short business meeting followed by a caving presentation, are usually held on the 3rd Tuesday of each month, starting at 7:00 p.m. However, the date, time, and location of meetings may vary, so please check the CCG website (www.caves.org/grotto/ccg/) or contact grotto chair Ashley Pospisil (860-869-0932) for any updates.

The Underground Movement is the official newsletter of the CCG. Submissions can be contributed by grotto members as well as friends of the grotto. Opinions expressed in articles are not necessarily a reflection of the official position of the CCG and NSS or shared by the newsletter editor, CCG officers, or grotto members. Unless it has been independently copyrighted (as indicated by © or as “reproduced with permission”), material published in The Underground Movement may be reprinted in any NSS-affiliated publication—pending permission of the author/photographer—provided appropriate credit is given and either a hard copy or a digital file made available.

Submissions to The Underground Movement, including original or reprinted articles, photographs, and artwork are welcome. Images (jpegs) and word files (composed in Microsoft Word, with minimal formatting) should be sent to the editor at underground_newsletter@yahoo.com. The CCG cannot publish copyrighted material without written permission of the copyright holder. Contributors are responsible for determining whether material is copyrighted, as well as for securing appropriate permission.

In conjunction with ongoing efforts to help diminish the spread of white-nose syndrome among hibernating cave bats, the Central Connecticut Grotto encourages cavers to adhere to all seasonal cave closures and to follow all recommended gear-cleaning & disinfection protocols. These can be found on the NSS White-Nose Syndrome Page (www.caves.org/WNS/). Your continued cooperation and support is greatly appreciated.

The Underground Movement

August 2017

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CENTRAL CONNECTICUT GROTTO OFFICERS (2017)

Chair: Ashley Pospisil
Vice Chair: Jamie Henderson
Treasurer: Norm Berg
Secretary: Alisa Werst
Webmaster: Norm Berg
Membership: Diane Lucas
Safety: Doug Truitt
Conservation: Amanda Cooper
Vertical: Felicia Millett
Equipment: Steve Millett
Member at Large: Emily Ray
Newsletter Editor: Danny Brass

Grotto officers can be reached through the CCG email address (info@ctcavers.org). The newsletter editor can be reached at underground_newsletter@yahoo.com.

Sinking Cove Cave
Thomas Holder
Central Connecticut Grotto members explore the depths of Sinking Cove Cave (Franklin County, Tennessee).
From the Editor’s Desk

I would like to express my thanks to those who contributed to the last several issues of The Underground Movement as well as to everyone who contributed to this month’s issue. It is only through continued submissions from the membership and friends of the grotto that a viable newsletter can be sustained.

Maintenance of suitable landowner relationships has always been a significant aspect of caving. When novice cavers first begin associating with NSS grottos, they are almost always indoctrinated into a way of thinking that strives to preserve inviolate the rapport between landowners and the caving community. In many instances, such a bond may have taken years to solidify. It is important to appreciate that a single act of thoughtlessness may be enough to sever this association in the blink of an eye.

Regardless of whether caves are located on federal, state, or private land, landowners must be respected if we are to retain access to underground locales and remain welcome visitors at such sites. Suitable behavior goes beyond simple acts of courtesy (e.g., closing gates, parking only in designated areas, keeping noise to a minimum, and not leaving trash behind). Cave closures, both permanent and seasonal, must also be respected by cavers. Sneaking into closed caves is trespassing, and can only have a negative impact on the caving community as a whole.

In the era of white-nose syndrome, it is paramount that cavers recognize the importance of adhering to seasonal cave closures. Administrative winter closures of bat hibernacula are of value in helping to minimize stress on bats suffering from this fungal malady. In this regard, failure to adhere to administrative cave closures may, ultimately, have an adverse impact on both bats and members of the caving community.

Although notable exceptions always exist, I think that NSS members are, by and large, very responsible when it comes to landowner relationships and proper cave stewardship. It is, however, important to intercept and educate non-affiliated spelunkers who, either knowingly or through ignorance, violate time-honored aspects of caving etiquette. Such interactions need not (and, indeed, should not) be adversarial in nature. Intercepting such folks, when observed, may help to preserve landowner relationships and keep local caves from being permanently closed to visitation (see page 23).
Hello EVERYONE!

Have you started packing yet? Has your grotto organized a “winter wonderland” for the Campground contest?

OTR 2017 is mere weeks away and things are progressing at a rapid pace by all of Santa’s elves so that this year’s OTR will be a Wonderful experience for all!

NEW

The Event Tent
Near and dear to my heart is the new “Event Tent”. This is a place where cavers can talk, discuss, display, learn and experience all things caving-related! Please plan to stop by; you may even get a toy for your Christmas Stocking!

Merch
New this year is the first ever OTR Collectors Pin. It’s a limited edition, so don’t wait until the Event thinking you can pick one up there. They’ll sell fast and when they’re gone, they’re gone! It comes with an undated lanyard that can be used year after year!

ONLINE ONLY: OTR leggings! Now these black leggings are NEW this year! Created by one of our own artists, these are available through ONLINE PREREGISTRATION ONLY.

LuLaRoe has nothing on OTR! And at a much more attractive price than most leggings these days, you’ll want a pair to slip on under your cavesuit or after a hard day of caving...OOOh they feel sooo good!

And what would Christmas be without ornaments? Our special edition OTR Christmas ornament will be available until they sell out! It’s gold, it’s non-breakable AND as one astute caver noticed it’s big enough for a small shot of your favorite libation!

Check out preregistration for these items and lots of other wonderful merchandise! The sale of OTR Merch ends on August 9! (Preregistration will continue after that date).

CHANGES

Preregistration and Ordering Merchandise
Preregistering will save you time when you get to OTR. The process has changed this year, but it’s still easy. Go to www.OTR.org, click on the “Event Info” tab at the top of the page, then click on “Register”. While you are registering you can also order all the great OTR merchandise mentioned above (but merchandise can only be ordered through August 9th).

Contests
You will see many positive changes this year that need brought to your attention.

- Men’s vertical will be FRIDAY 9 am until noon (ONLY)
- Women’s vertical will be FRIDAY 1 pm until 4 pm (ONLY)
- Youth’s vertical will be SATURDAY from 9 am until noon (ONLY)
- Obstacle Course will be FRIDAY noon until 4 pm and again DUSK until? And SATURDAY 11 am until 5 pm

Awards
The AWARDS will be held in the CONTEST AREA. You will receive your certificate; OTR bucks and have a photo taken.

- MEN’s Vertical AWARDS: FRIDAY 1 pm
Picnic Tables
We are no longer able to reliably provide picnic table delivery and return. As in the past it is your responsibility to pick up AND ultimate responsibility to return your picnic table to the collection spot. There MAY BE someone available to assist, but it will be up to you to arrange. Please note: This will be a VOLUNTEER donating his OWN time and tipping would be appreciated. Picnic tables not returned at the end of Event will be either held for ransom or sacrificed to heat Santa’s workshop.

Coat Drive
There will be a coat drive for local charity to show the community we’re not just a “Party Face”. Every donation of a new or gently used coat will put you in the drawing for a free admission 2018! WOW! That’s a great deal! Depending on the amount of coats we may have more than one freebie! The collection point will be Cooters.

The Annual Doo-Dah Parade
Will be Saturday EVENING this year and like any self-respecting Christmas Parade we’ll have a real fire truck! Let’s see just how many Santa’s we can put on OUR Holiday Parade red engine! If you’ve got a beard, are thinking about a beard or just haven’t shaved over the weekend just say Ho-Ho-Ho and hop on! Get your lights ready and let’s get MERRY!

And Don’t Forget...
Don’t forget the “usual antics” of the Bar Contest, Campsite “Winter Wonderland” competition, our world famous Dome (Santa’s Snow Globe this year), our wonderful vendors (there are new ones this year), Cooters, the Bonfire Thursday night, and all the other good stuff that makes OTR such a special event to us all!

All the Best! I look forward to seeing you all soon!

Sarah Mosberg
AKA ”Mrs. Claus”
OTR Chair 2017, 2018
OLD TIME
BARN DANCE
AT
KNOX CAVE
9th Year!

Knox, N.Y. - Octagon Barn, Middle Rd.

Sat. September 30

Dancing 7 to 10PM, Doors open @ 6:30

Featuring Paul Rosenberg & Tamarack

Live fiddle band playing traditional early American, Celtic, French-Canadian, Old-time and original fiddle tunes. Easy to learn step-by-step contras, squares and folk dances. No experience necessary, all dances are taught. Raffle & Door Prizes!

Sponsored by
Northeastern Cave Conservancy

$10 per person ($5 for students), $20 per family, children under 12 free
Refreshments and light snacks will be served
A Gathering of Geriatric Cavers. Photo by Gayle Heney.

(Left) Ron Zeheb, Nathan Appel, and Bill Hassel at the entrance to Schoharie Cave. Photo by Danny Brass. (Right) Schoharie Cave entrance and dedication plaque. Photo by Nathan M. Appel.
Caving in Schoharie Cave (Schoharie, New York) and après-cave tubing in the Beaverkill River. Soaking up excess water with newspaper followed by use of an electric fan, if available, is an excellent way to help dry out wet caving boots. All photos by Nathan M. Appel.
During the CCG caving weekend in Schoharie, NY, grotto members Amanda Cooper, Jeff Lydic, and Norm Berg participated in the NCC work day at John Boyd Thacher State Park. They assisted Tom Engel in checking out various karst features in the park, and also briefly explored Daddy Long Legs Cave. Bottom Right - Campground at the Schoharie Caverns Nature Preserve at sunrise. All photos by Norm Berg.
A man has died and more than 40 people are being treated for possible rabies exposure in north east Brazil, following an alarming spate of attacks by vampire bats, it’s been reported.

The death is the first recorded case of human rabies, transmitted by a bat, in Brazil since 2004.

The outbreak is the largest wave of attacks ever registered in the region and is being attributed to a disturbing rise in the bat population nesting close to humans.

On Saturday May 27, disease control teams from Bahia state health authority (SESAB) were out in force culling Vampire bats by catching and applying a venom paste to their bodies, in a bid to control the rising numbers.

According to SESAB, Edivalson Francisco Souza, the 46-year-old who died, was milking a cow on a farm in Paramirim when he accidentally stepped on a rabies-carrying bat that bit his foot.

The farmer dismissed the incident, washed the wound but failed to see a doctor.

Three weeks later, after being hospitalised for seven days suffering from headaches, nausea, severe anxiety and shortness of breath, Edivalson remembered the incident.

He tested positive for rabies but it was too late for doctors to administer the vaccine and he passed away shortly afterwards in March this year.

SESAB immediately issued a public health alert, warning of the risks of contracting rabies and ways to stay vigilant.

Within days of the fatality, residents living in the capital city, Salvador, some 400 miles from Paramirim, reported a flurry of attacks by the blood-thirsty creatures that appear to have added human blood to their menu.

Over the last three months, dozens of frightened locals have told of being terrorised by the flying mammals at night.

Many have woken up to the distressing sight of their bed sheets soaked with blood after the winged animals sunk their fangs into their toes, heels and elbows.

One of the victims, Matheus Andrade, who lives in the historic centre of the city said: “I was bitten three times, twice on my toes and once on my heel, in two successive nights around the middle of May.
Over the last three months, dozens of frightened locals in Salvador have told of being terrorised by the bats at night. Many have woken up to the distressing sight of their bed sheets soaked with blood after the creatures sunk their fangs into their toes, heels and elbows. Above, the injury suffered by one unnamed resident. Photo by Janet Tappin Coelho.

“I didn’t realise until the second time that I had been attacked by a bat. At first I thought I had somehow cut my toe during the night.

“I normally sleep with the windows and doors open and the bats flew in. I never felt any pain at all on both the nights I was bitten. But in my dreams, I did feel as if something had hooked itself onto my toe.

“When I woke up in the morning, I found the bed was wet. It had been raining overnight and I thought water had dripped in. But it was my blood. It was such a shock.

“The wound was tiny but deep, the blood was dark and thick and the area wouldn’t stop bleeding even when I tried washing it off.”
The 22-year-old refrigerator engineer was not the only member of his family to suffer the terrifying ordeal.

His mom, Rose Fernandes, 54, said: “I was bitten on my toe too while I slept. I didn’t feel anything. My husband woke me up and showed me the dirty sheet.

“We thought I had cut myself without knowing. But as soon as Matheus told me the same thing had happened to him we realised it had to be a bat because of the fang like puncture marks in our toes.

“It has never happened before and it was very frightening. Now we shut up all the windows and doors at night even though it’s hot.

“And it’s a good thing we did because the other night I woke up in the early hours of the morning at 1:30 because I heard something banging up against the window.

“The bat that had bitten me before seemed to have come back for more and was trying to get in. It kept hitting against the glass. It even flew away at some distance and came hurtling back even harder slamming up against the window,” recalled the teaching assistant, shuddering at the memory.

Both mom and son went to the Couto Maia Hospital and have been prescribed 30 days of anti-rabies and tetanus vaccines, which must be taken until the middle of June.

According to veterinarian Aroldo Carneiro, it’s common for people to confuse bat bites with a simple cut.

Vampire bats, or the common bat, are small nocturnal creatures with a wingspan of about eight inches. They only live in the Americas and feed solely on blood, puncturing the skin of their prey with sharp incisors.

Carneiro, who heads the rabies surveillance unit, explained: "The bite does not cause intense pain because in bat saliva there are analgesic and anticoagulant substances, the latter prevents the quick healing of the wound.”

He stressed that bat attacks on humans are rare in Salvador but cited destruction of the nocturnal mammals’ natural habitat and large numbers of abandoned properties in the city centre as factors contributing to the outbreak.

He said: “We have detected shifts in bat behaviour and a worrying increase in the population in the area. We believe this is due to deforestation and the destruction of caves, which forces the bats to migrate to the cities.

“The city centre does not have the normal source of food for hematophagous beings (who feed on blood) such as horses and cattle. The Vampire bats must find an alternative to live so they bite dogs and cats, and when these aren’t available they turn to humans.

“In addition, there are many buildings in the historical centre of Salvador which are abandoned and have openings that give access to the wild animals. The empty places provide shelter and nesting sites and this has allowed the numbers to grow.”
To combat the wave of attacks a task force of disease control agents have been visiting homes in the terrorised neighbourhoods advising residents on how to protect themselves at night by keeping windows and doors shut, putting up mesh screens, plugging cracks in the roof that can serve as an entrance for the animals, illuminating dark areas in the house and not leaving fruit out overnight.

The teams have been vaccinating cats and dogs. Last year, 91,000 dogs and 32,000 cats were immunised, and agents have been reemphasising to residents that rabies is almost always fatal unless victims receive early preventative treatment.

Recent surveillance action resulted in the capture of 16 bats and lab tests identified the presence of the rabies virus in a couple of those caught.

Carneiro said: “Our disease surveillance teams have been out over the weekend controlling the numbers by trapping them and putting a venom paste on their bodies. This poison is passed on when they make contact with other bats.

“They must to be culled because there are too many in the area, living too close to residents.”

Professor Valdirene Meira da Cunha, 42, believes a bat mistook her home for a cave because after feasting on her big toe, it took refuge on her wall.

She said: “I turned on the light and I couldn’t believe it, the bed was covered with my blood. I don’t know what made me look up, but when I did I saw the bat hanging on the wall above my head.

“It was like a scene out of a horror movie, it was absolutely terrifying and my scream woke everyone up.”

Pensioner Ubaldina dos Santos, 85, said she has not been able to sleep since the outbreak in the area.

“We’re trying not to panic,” she said anxiously.

“But the houses we live in are old, with crevices and cracks where the bats can enter.

Everyone is living in fear of waking up and finding a Vampire bat drinking their blood like Dracula,” she added.
Evidence of Ritualized Cannibalism in the Ancient World.

As I’ve said repeatedly over the years, caves offer archaeologists diverse opportunities for uncovering a wealth of material that shed light on our distant past.

In the ancient world, art reached a zenith during the course of the Upper Paleolithic (dating from approximately 45,000 years ago until about 10,000 years ago). The creation of portable (mobiliary) works of art was most pronounced during the Magdalenian culture of Ice-Age Europe (approximately 17,000 years ago until the end of the Ice Age around 11,000 years ago). These works included decorations and carvings made of bone, antler, and ivory—some representational in nature and others merely geometric designs. However, the use of human bones for such purposes has not previously been reported.

A significant assemblage of human bones from the Magdalenian period has been unearthed from Gough’s Cave (Cheddar Gorge, Somerset, UK). Many of these bones show unmistakable evidence of extensive processing for the removal of edible tissue (i.e., human cannibalism). Butchery marks made during the course of disarticulation, scalping, marrow extraction, and filleting include defleshing incisions, percussion marks, and human tooth marks. The skeletal remains recovered from Gough’s Cave have been studied in great detail by Bello et al. (2017).

Included in this assemblage of bones is a human radius (one of the two bones in the forearm) with an unusual zig-zag pattern of incisions engraved along one side. The pattern itself is not unique for the Magdalenian culture. In fact, such geometric designs (so-called non-figurative art) are a relatively common feature of Upper Paleolithic art. However, the presence of such markings on human bones has not previously been confirmed. The use of human bones for utilitarian purposes is also extremely rare although Bello et al. (2011) previously reported the finding of human skullcaps from the Magdalenian horizon of Gough’s Cave that had been modified for use as drinking cups. Dated to approximately 14,700 years before present, these are the oldest skull cups known, and the only ones from the British Isles.

The 63-millimeter-long zig-zag pattern was engraved on a portion of the bone distant from sites of muscle attachment (origin or insertion). Extensive analysis (including scanning electron microscopic study and comparisons with engravings on animal bones and butchery marks on human and non-human skeletal remains) enabled researchers to reconstruct various aspects of how these marks were produced, as well as the ordering of individual incisions. It also confirmed that these marks were deliberately produced by human hands and not part of any butchery process.

The authors of this study hypothesize that these marks were symbolic in nature, and represent the strongest evidence currently available to support the practice of ritualized cannibalism, a behavior not previously known from the Paleolithic.

Photograph and drawing of the zig-zag incisions on an engraved human radius from Gough’s Cave (southwestern England). The markings are arranged in four distinct groups. Scanning electron microscopy reveals details of individual incisions. Reproduced, with permission, from Bello et al. (2017).


News from the World of Cave Biology

Cave Fish Discovered in German Cave

*Discovery of the First European Cave Fish.* A host of animals live belowground for either all or part of their life cycle. As such, the extent to which they may have developed specialized adaptations for underground life varies considerably, ranging from little to no adaptations to a remarkable suite of evolutionary changes. The constellation of changes in those animals showing marked adaptation is most pronounced in obligate cave dwellers (troglobites) and is known as troglomorphy.

Among the vertebrate troglobites, cave-adapted fishes are the most numerous. Until recently, however, such fish have not been described in European caves. In a recently published account, Behrmann-Godel *et al.* (2017) reported the discovery and description of the first cave fish, a loach of the genus *Barbatula,* to be found in a European cave.

As expected, these cave-adapted fish exhibit a number of unique adaptations compared to surface-dwelling loach populations. These included reduction in eye size, pale coloration, enlarged maxillary barbels, and a shortened lateral line system. The fish were also devoid of scales (a limited number of scales are present in surface-dwelling loach populations).

The discovery was made by cave divers in 2015, who observed and photographed the fish in the Danube-Aach system of southern Germany (in the region of the Swabian Alb, which is home to a large number of well-known cave systems). Continued observations were made by divers over a period of time between August 2015 and November 2016. Five of the fish (two adults and three juveniles) were collected for further study. The presence of juveniles indicated the existence of a breeding population.

Genetic analysis indicated that these fish are genetically isolated from surface-swelling loaches (*Barbatula barbatula,* and of relatively recent evolutionary origin. They are not a displaced population of surface fish, but a genetically distinct population (with less genetic variability than evident in their surface counterparts).

These fish were not only the first cave-adapted fish to be discovered in Europe, but are, to date, the most northern population of cave fish ever found (47° north latitude). Moreover, the opening of the Aach Spring is believed to have occurred only after the retreat of Alpine glaciers, some 16,000 - 20,000 years ago. This contradicts earlier beliefs that cave fish cannot become established in previously glaciated areas (although this concept may hold true for ancient lineages and not for recent lineages such as *Barbatula*).


**Troglophile:** A wide variety of species may be intimately associated with caves (i.e., capable of completing their entire life cycle underground), but not restricted to them. Populations may exist in both underground and surface habitats, and the movement of individuals between these environments may provide a mechanism for the flow of genetic information. Stygophile refers to aquatic specimens.

**Trogoxenes:** These are animals which live a portion of their life cycle in caves (they may use caves for shelter, hibernacula, or maternity roosts), but which must periodically return to the surface in order to complete their life cycle. Common examples of trogoxenes are bats and cave crickets, which regularly leave the cave to find food. In doing so, they bring nutrient resources into the cave environment (primarily in the form of droppings). As such, they are invaluable components of underground ecosystems. Stygoxene refers to aquatic specimens.

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1 The cave system itself is believed to have formed approximately 400,000 - 450,000 years ago.
The Underground Movement

News From the World of Bats

Behavior of Silver-Haired Bats at a Migratory Stopover Site. Temperate-zone bats face harsh conditions, primarily cold temperatures and lack of food availability, during winter months. Many species of bats utilize hibernation as a winter survival strategy. The reduction in body temperature, activity, and metabolism that characterize the torpid state help bats to conserve energy and survive until spring.

However, not all bats make use of this survival mechanism. Some species, such as the eastern red bat (Lasiurus borealis), hoary bat (Lasiurus cinereus), and silver-haired bat (Lasionycteris noctivagans), defy local weather conditions and make long migration through Canada and the United States to warmer climes during the winter months. While some migrating bats move only short distances (on the order of a few hundred kilometers), others may migrate more than a thousand kilometers each year.

Compared to migratory birds, whose migration patterns have been well documented, relatively little is known about the migration patterns of bats. Of interest, in this regard, is the energy costs of migration of bats compared to that of birds. During the course of lengthy flights, bats remain strictly nocturnal and do not fly during daylight hours. Hence, long flights necessitate making stops during daylight hours. At such times, do bats need to spend several days refueling, as birds do, before moving on? Or do they carry enough fuel for long-distance journeys without requiring multi-day stopovers?

This question was addressed by McGuire et al. (2012), who studied aspects of migratory stopovers of silver-haired bats, a tree-roosting species that shelters in rock crevices, cavities, and beneath loose tree bark. During August and September, this species makes long-distance migrations across North America to overwinter in areas with a more favorable climate, possibly in the southeastern and southwestern parts of the United States. In these regions, bats may remain active and feeding throughout the winter months, becoming torpid only when temperatures drop below freezing. The time required for these bats to complete their migrations are unknown.

Bats were captured in mist nets from a study site on Long Point (Ontario, Canada), a peninsula along the north shore of Lake Erie. Captured bats were fitted with a digitally encoded transmitter. Subsequent movements while in the region were monitored with an automated digital radio-telemetry array. During daytime hours, a handheld antenna was used to search for the transmitters (i.e., daytime roosts). Roost sites were confirmed visually whenever possible, or approximated when not.

Between August 20 and September 17, 79 bats were captured, 60 of which were silver-haired bats. Of these, 51 were sub-adults. The authors discussed the possibility that adult bats preferred roosting at a different site.

Bats were noted to arrive in two separate waves, one centered around August 27 and the other centered around September 12. All adults were captured in the second wave. With the exception of one bat captured near midnight, all bats were captured in the hours just before dawn, suggesting that they were captured as they first arrived at the study site. Radio transmitters were affixed to 30 bats (17 males and 13 females).

The duration of stopovers at the study site were quite short. The majority of bats (21 of 30) left the night after first capture. Telemetry analysis indicated that these bats foraged after arrival or prior to departure. Seven bats remained at the site for two nights; however, this was associated with rain. None of the bats departed on evenings when it rained, since flying in the rain may increase both energy expenditure and risk. These bats foraged during their stay, which may reflect their taking advantage of the opportunity afforded by inclement weather. Otherwise, minimizing stopover time may be prioritized. Only two bats remained at the site for a prolonged period of time (13 and 22 days).

The duration of stopover for most bats was far shorter than is typical for migrating passerine birds. This is suggestive of a greater energy efficiency of bats during stopovers, and may be related to an energy-saving torpor strategy. Thus, bats do not use up nearly as much energy during stopovers as birds do (which is primarily associated with maintenance of body temperature). As such, roosting in a torpid state may enable bats to migrate long distances at only a fraction of the energy costs incurred by birds. The authors proposed the term ‘torpor-assisted migration’ to describe this strategy.

Do Bats Harbor Antifungal Bacteria? *Pseudogymnoascus destructans*, the fungal agent responsible for causing White-Nose Syndrome (WNS) continues to spread across North America. At the time of this writing, WNS has been reported in 31 states and five Canadian provinces. The disease has had a devastating effect on populations of cave-hibernating bats, especially in the Northeast. An estimated six to seven million bats have died from this emerging fungal disease.

As some researchers struggle to understand the pathophysiology of this disease, others seek ways to mitigate its effects. In this regard, a variety of options for the control of WNS have been explored. In doing so, scientists must find ways to balance antifungal efficacy against the potential for environmental contamination.

The majority of antibiotics currently in use are derived from microorganisms, primarily those in the genus *Streptomyces* (Actinobacteria). Members of this genus are also well known for secreting antifungal compounds. The Actinobacteria are commonly found in cave environments (cave walls and guano deposits), as well as on the skin of bats.

In a recent study, Hamm *et al.* (in press) evaluated the capacity of various microbes isolated from bats to inhibit growth of *Pseudogymnoascus destructans*. Bacteria were isolated from skin swabs (wing and tail membranes) and fur taken from 12 species of healthy bats from Arizona and New Mexico.1 Of 632 bacterial isolates obtained from these specimens, 543 (85.9%) were Actinobacteria, with *Streptomyces* being the predominant genus isolated (422 of 543). Fungal bioassays revealed that 36 of the 632 isolates (5.7%) had antifungal activity against *Pseudogymnoascus destructans*. The majority of these isolates were obtained from the cave myotis, Brazilian free-tailed bat, Townsend’s big-eared bat, and big brown bat.2 Among these 36 isolates, 32 (89.9%) were members of the genus *Streptomyces*. The remaining four genera included *Streptosporangium*, *Luteipulveratus*, *Nocardiopsis*, and *Rhodococcus*. The degree to which bacterial isolates inhibited the growth of *Pseudogymnoascus destructans* varied; three isolates (*Streptomyces cyaneofuscatus*, *Streptomyces anulatus*, and *Rhodococcus rhodochrous*) showed complete suppression.3

The discovery of additional bacterial species living in caves that may exert significant adverse effects on the growth of *Pseudogymnoascus destructans* is important for several reasons. Caves are known to harbor an enormous diversity of microbial life, many of which have antibacterial and antifungal properties. The majority of cave-dwelling microorganisms have yet to be described and characterized. In the wake of continued development of antibiotic resistance of medically important microbial pathogens, caves represent important potential sources of new antibiotic and antifungal agents.

Bacteria with antifungal properties may also be of value in helping to mitigate the ongoing threat of WNS. The use of such agents as probiotics (microorganisms that can provide health benefits to humans and animals when ingested) may prove to be a viable option in helping to curb the adverse impact of WNS. Use of such products may help to prevent environmental contamination (especially of groundwater) that might follow the widespread distribution of chemical antifungals.

Of course, considerable work is needed to fully assess the potential benefits that might be provided by antifungals of bacterial origin. Efficacy under laboratory conditions does not necessarily translate into similar efficacy in the wild.

1Pallid bat (*Antrozous pallidus*), Townsend’s big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), California myotis (*Myotis californicus*), Western small-footed myotis (*M. cilolabrum*), long-eared myotis (*M. evotis*), fringed myotis (*M. thysanodes*), cave myotis (*M. velifer*), long-legged bat (*M. volans*), western canyon bat (*Parastrellus hesperus*), and Brazilian free-tailed bat (*Tadarida brasiliensis*).

2One might wonder if the presence of such bacteria on the skin and fur of big brown bats might be related to reports of the relative resistance of this species to WNS (see the February 2016 issue of The Underground Movement for additional information: http://www.caves.org/grotto/ccg/um/2016_02_um.pdf)

3Previous work has highlighted the antifungal properties of both *Rhodococcus rhodochrous* and *Pseudomonas* sp., specifically their efficacy in inhibiting the growth of *Pseudogymnoascus destructans*. Additional information on the antifungal properties of these bacterial species, and their potential use in therapeutic strategies against spread of WNS can be found in the December 2014 and June 2015 issues of The Underground Movement (see http://www.caves.org/grotto/ccg/um/2014_12_um.pdf and http://www.caves.org/grotto/ccg/um/2015_06_um.pdf)
A Need to Establish Guidelines for Mass Bat Exposure Events. The Advisory Committee on Immunization Practices (ACIP) provides recommendations for investigating potential human exposures to bats in the home. In view of the fact that the majority of indigenously acquired human rabies cases in the United States are associated with a bat variant of virus and that a large percentage of these involve no known exposure (so-called cryptic bat rabies), public health authorities in this country have largely adopted the need for aggressive testing of bats found in the home.

Despite difficulties in clearly establishing that a relevant exposure occurred, the high fatality rate (almost 100%) of clinical rabies warrants caution in assessing risk parameters. At the same time, care needs to be taken to ensure that excessive, unnecessary, and potentially expensive post-exposure treatments aren’t needlessly recommended.

Accordingly, the ACIP (CDC, 2008) recommends, “The risk for rabies resulting from an encounter with a bat might be difficult to determine because of the limited injury inflicted by a bat bite (compared with more obvious wounds caused by the bite of terrestrial carnivores), an inaccurate recall of a bat encounter that might have occurred several weeks or months earlier, and evidence that some bat-related rabies viruses might be more likely to result in infection after inoculation into superficial epidermal layers. For these reasons, any direct contact between a human and a bat should be evaluated for an exposure. If the person can be reasonably certain a bite, scratch, or mucous membrane exposure did not occur, or if the bat is available for testing and is negative for presence of rabies virus, postexposure prophylaxis is not necessary. Other situations that might qualify as exposures include finding a bat in the same room as a person who might be unaware that a bite or direct contact had occurred (e.g., a deeply sleeping person awakens to find a bat in the room or an adult witnesses a bat in the room with a previously unattended child, mentally disabled person, or intoxicated person). These situations should not be considered exposures if rabies is ruled out by diagnostic testing of the bat, or circumstances suggest it is unlikely that an exposure took place. Other household members who did not have direct contact with the bat or were awake and aware when in the same room as the bat should not be considered as having been exposed to rabies. Circumstances that make it less likely that an undetected exposure occurred include the observation of bats roosting or flying in a room open to the outdoors, the observation of bats outdoors or in a setting where bats might normally be present, or situations in which the use of protective covers (e.g., mosquito netting) would reasonably be expected to preclude unnoticed contact. Because of the complexity of some of these situations, consultation with state and local health departments should always be sought. If necessary, further guidance can be sought from CDC and experts in bat ecology.”

ACIP guidelines pertain to instances of single person/single bat exposures. From time to time, instances arise in which numerous individuals may have been exposed to one or more bats (i.e., a mass bat exposure or MBE event). Although no multiple human rabies deaths from MBE events have been reported, such scenarios do occur, for example, when children bring downed bats to school, or when bat colonies become established in apartment buildings, vacation homes, summer camps, etc.

No guidelines have been developed for responding to MBE events. Consequently, responses among public health agencies to MBE events have not been consistent, ranging from recommendations to vaccinate everyone involved to complex triage systems designed to identify individuals at highest risk of exposure. Recently, Hsu et al. (2017) investigated responses of public health agencies to MBE events in order to assess the experience of different agencies with such scenarios, identify inconsistencies in response, and make recommendations for establishing suitable and balanced public health guidelines.

MBE experience of public health agencies varies considerably. Because standardized, MBE-specific protocols are not currently available, individual agency responses are dictated primarily by previous experience. Those with little or no experience may not be adequately prepared to deal with MBE investigations. The authors suggest that establishing national MBE guidelines would be of considerable benefit to public health agencies tasked with responding to zoonotic disease transmission. As such, an MBE working group, consisting of bat rabies experts at both the CDC and state level, has been established to help formulate guidelines for investigating MBE events.

Be wary of handling grounded bats, such as this bat found in the backyard of a Connecticut home. Sick or injured animals, including bats, may bite if disturbed. By far, the highest incidence of bat bites occurs among persons who pick up sick or injured animals. While usually not actively aggressive (and often too weak to even be capable of aggression), these animals may bite in self-defense when handled. Both the curious passerby and the Good Samaritan risk a bite exposure when handling grounded animals. Fallen and partially paralyzed bats found by people or easily captured by cats, dogs, or other animals, may be quick to bite. Grounded bats are much more likely to be rabid than otherwise healthy individuals. All instances of physical contact with bats should be avoided. When such contact does occur, a risk assessment by knowledgeable public health authorities should be sought.

I think it's very appropriate that bats are getting good press in schools and even preschool. A wide array of books for young readers are currently on the market, which help to portray bats in somewhat less than a sinister capacity. In fact, students and youngsters of all ages should be taught to appreciate the natural world about them. And bats are as good a group as any to begin with. However, a balanced discussion is important and it is imperative that children be taught sensible precautions in their interaction with wildlife. Readily approachable animals are much more likely to be sick or injured and injured ones are much more likely to be painful and in distress. In either case, an encounter carries a significant risk of ending in a bite. In the case of young children and wildlife, a significant exposure history (especially following interaction with a bat) may never come to the attention of an adult—with potentially disastrous consequences. Children should be educated about the potential dangers of handling any wild animal, including small, seemingly innocuous bats. Even toddlers have been bitten by grounded, rabies-positive bats when parental attention has momentarily lapsed. Both parents and teachers should be encouraged to prevent contact of children and pets with wild animals. Photo by Jack Dillon.
Over the course of two million years of hominin evolution, early artistic stirrings progressed into a diverse symbolic industry, ultimately leading to pecked and engraved lines in stone; jewelry and pendants made from shells, bones, or teeth; portable art; figurative art; and the parietal, polychrome productions on rock faces and cave walls.

For archaeologists, the most challenging facets of unraveling the earliest examples of artistic symbolism are 1) determining their true origins (i.e., manmade or naturally produced, such as by animal-gnawing/trampling or as a result of geologic processes), 2) establishing whether such finds are utilitarian (e.g., regularly arranged butchering and defleshing marks on bone) or non-utilitarian in nature (e.g., geometric grooves deliberately cut into bone and reflective of symbolic or abstract thought), and 3) accurately dating these artefacts. In this regard, the authors call attention to a wide array of archaeological finds (including ancient cave art), considering different perspectives on their age, authenticity, and significance.

However, the authors also point out that artistic and symbolic representations are not restricted to manmade objects. Rather, they may also encompass naturally occurring curiosities, such as small rocks that evoke an image of a human face (like the Makapansgat pebble). These may have been of considerable interest to ancient people, and suggestive of a non-utilitarian awareness. When and why our early ancestors began to collecting these items of interest (such as manuports referred to as pierres figures) remain points of contention among archaeologists.

The First Artists is a well-written, scholarly text that provides an in-depth and critical analysis of early human artistic endeavors. A survey of relevant finds is global in scope. The authors stress the universality of art as a basic human characteristic, exploring qualitative and quantitative changes in the extent of human symbolic activity throughout the course of our evolutionary and cultural history. Although no definitive answer to the question of when art first arose is forthcoming, the authors do an excellent job highlighting the many difficulties inherent in making such a determination. This book will be of value to readers interested in the various controversies surrounding the origins of symbolism and abstract thought.

1While some of the earliest traces of art and symbolism (e.g., those associated with song/dance, tattoos, and products made of wood or feathers) have not been preserved and are now lost forever, the authors marshal evidence to confirm or refute the authenticity of “artefacts” that have survived the rigors of time.
"Owls are owls and bats are bats. Can they all live together?"

A mother owl and her family of three young owlets have taken up residence on the branch of a large tree. One evening, however, they find a mother bat and her three pups hanging from the underside of the branch. Although one of the small owlets and one of the bat pups are curious about each other, their parents are both somewhat wary of the strange creatures on the other side of the branch. The mother owl moves her young as close as she can to the tree trunk, and the mother bat moves hers to the far end of the branch.

However, an inquisitive, young owlet and an equally curious bat pup tentatively approach one another. But their moms will have none of this, quickly separating the youngsters and ushering them to their own sides of the branch.

And so it goes until one day the tree is engulfed in a huge storm. The fierce storm blows both the owls and the bats off of the branch. The young birds and bats are helplessly tossed about in the strong winds.

The mother owl and mother bat frantically fly about searching for their young, bringing them back to the branch one by one. But wait, one of the owlets and one of the bat pups are missing. Off the mothers go into the tumultuous storm to find them. And them something amazing happens: the mother owl returns to the branch, with a small helpless bat pup in tow, and the mother bat returns clutching a frightened, young owlet.

And the mother owl and mother bat suddenly realize that there is no reason why their respective families can’t be friends with one another. They watch contentedly as their youngsters then fly off the branch to play together in the gathering moonlight.

This is a delightful picture book for children 3 – 7 years of age (preschool – grade 2). Although there is no written text, the gestures and facial expressions of the birds and bats are sufficient to convey the author’s meaning.

Beyond the concept of a pleasant story, the book offers parents a powerful opportunity to teach children about tolerance and getting along with others, especially those who may be somewhat different from themselves.
In 1875, a decade after the Civil War, the U.S. Government detached the 3rd Battalion from the army’s 47th Regiment to establish an outpost 32 miles NNE of Fort Stanton, New Mexico. Fort Heelblister was named in honor of Lt. General Reginald S. Heelblister. The fort was located near a water source: a sinkhole that was incorporated within the stockade’s perimeter. Opening off the sinkhole’s bottom was a cave, coincidently enough, named Fort Heelblister Cave. From inscriptions on the wall, we know soldiers visited the cave with their wives on Sundays and Mondays, and with their sweethearts on Saturdays. Some 4.62 miles of the cave were surveyed by Sgt. G. Brick, but without cross-sections or north arrow.

I was contacted last year by Superintendent Sage B. Rush, BLM Region 26, to resurvey the cave to contemporary standards. I was offered a no-bid contract for $15,238, which I accepted. Since solo surveying is not safe, I recruited local cavers John McMac, Barb Wyer, and Lew Skinflint to round out my mapping team.

We arrived at the cave late on a Thursday in June, set up camp, and inventoried our caving gear. McMac was six feet, nine inches tall, with red hair, freckles, and a red bandanna over his face. Lew was four feet, two inches tall, white haired, and covered with tattoos of all known western cattle brands and Krookodile figures in line-dance mode. Barb wore a broad smile and a merry twin-kle in flashing, blue eyes. They were all reputed to be renowned cavers.

The next morning, after a hearty breakfast of Spam, eggs, pancakes, waffles, bacon, sausage, and biscuits, gravv and two gallons of coffee, we elected to delay our entry by two days.

During the trip, we reached a stopping place at a terminal breakdown, known to be so by its name on the old map: Grand Central. I calculated the error of closure at 0.2 feet, while John, Barb, and Lew cursed and moved rocks on the left side of the breakdown. The ensuing wind blew out all our electric LED lamps, leading us to believe that either a tornado whirled outside the cave or a borehole beckoned beyond breached breakdown.

We celebrated our breakthrough beyond breached breakdown by eating three Mr. Goodbars apiece, three Payday, and a Nature Valley Granola bar for health reasons. Two days later, we resumed our survey into virgin cave.

Barb’s trip report best describes our survey progress: “We were all armed with DistoZs, so we could move briskly along the 47.8 W x 62.3 H canyon, profusely decorated with conifer size stalagmites and VW size stalactites, glittering giant crystal chandeliers, pipe organ size flowstone walls in cream, orange, beige, mauve, and rosy red velvet. Each successive room was larger or smaller and more or less decorated with bigger or smaller speleothems. Helictites, angel hair, crystals as long as pole vault poles, and cave pearls like bowling balls. It was pretty unbelievable and vice versa.” I admired her restraint and understatement.

One side lead angled down and promised more going cave. We surveyed along a zig-zag course and entered a passage with a glittering ceiling of stars, planets, and asteroids punctuating a black ceiling. It stretched around a curve far away, shedding sufficient light to read an apartment rental contract. Indeed, we had found the Milky Way underground. John said we must name it Milk Dude, but Lew said that sounded too much like Milk Duds. Nothing Dudish about that passage!

Barb asked to name it Snowy River. I said that sounded too much like Snotty River, and besides, Fort Stanton Cave already had a Snowy River. They’d never forgive us. I was paying the bills, so I said the name was Milky Way, in honor of the part of the galaxy that we could see under the New Mexico sky.

The following day, we left a note at the entrance and started the survey of Milky Way. The passage headed more-or-less straight south, shot after shot. We were glad we had brought sufficient candy bars for a 36-hour trip. Camping would have required logistics, so we agreed on continuous survey. The “stars” on the ceiling of the passage continued to appear exactly as the Milky Way would have appeared on a night outdoors.

At the 36-hour point, we stopped for candy bars. We had surveyed 12.9 miles (20.8 kilometers). A stronger breeze than normal sprang up, and an owl hooted a spooky dirge.
The new moon loomed on our right. Moon?? What the…? Barb screamed, “We’re outside!!!”

Outside? Yes, indeed. We were so fatigued by our repetitive 200-foot shots and the 120-foot-wide passage hour after hour that we surveyed our way out an exit and had mistaken the real Milky Way for the cave ceiling! How long had we been outside? Did anyone notice coming out of the cave? Had we exited in daylight, I’m sure we would have noticed. Distant sirens caught our attention. Flashing red-and-blue lights bore into our little candy circle. Heavily armed swat troops in black coveralls, bullet-proof vests, and black helmets surrounded us.

“Drop your bars!” they yelled through bullhorns. “Face down on the ground. Anyone moves gets it!” Lew didn’t move fast enough to please, so the lead trooper forced him upside down with his Koch & Heckler MP5 submachine gun. I heard radio traffic. “Yah, we got ‘em all. Ten four. Ten minutes tops.” We were zip tied and dumped into the rear of two black SUVs.

At an underground sally port, we were stripped, read our rights, separated, and water boarded. Finally, we were blindfolded, prodded into a blacked-out minibus, and delivered to Fort Heelblister as the sun was rising in the East. We were never told where we were or why the black-ops team didn’t use black helicopters. And we don’t know where the cave ended and the outdoors began, so we don’t know the real length of the Milky Way passage.

### TORY’S CAVE SINKHOLE CLEANUP WORK DAY

Hello all. As some may have heard, the CT DEEP has received a grant to install a gate on Tory’s Cave in New Milford, CT, to protect the bat population during the winter hibernation season. That work may happen fairly soon in the next few weeks, and there will be a call out for volunteers to assist with the gate construction, as soon as we know the dates.

This coming Sunday, August 27th, we will be holding a cleanup of the sinkhole in advance of the gating project. There are numerous large branches and trees as well as some loose rocks in the sinkhole that need to be cleaned out to make the area safe for the next part of the gating project work. If you’d like to lend a hand (we could probably use 6 to 10 or so folks) please email me at vicepresident@necaveconservancy.org. Meet at the cave parking area at 10:00 am; bring work gloves, hand tools, etc.

Bob Simmons
Northeastern Cave Conservancy
Jeff waved briefly, slid over to the edge of the rock, and tumbled over the brink. Carefully regulating the flow of air into his vest, he made certain to sink very slowly. This would lessen his chances of bumping against the walls or of stirring up the silty bottom, a scant 10 feet below him. As he neared the bottom, Jeff reached an arm out to brace himself against the single outcrop of rock that rose like an isolated mountain peak out of the silt-laden floor.

The newly discovered tunnel was almost directly in front of him. Keeping arm and leg movements to a minimum, he cautiously positioned himself so he could peer inside the shaft. As elsewhere in the system, the water was crystal clear. He could see perhaps eight or ten feet down the tunnel, before it curved gently to the left. The guideline came down behind the monolith and bent 90 degrees as it looped over the lip of the restricted entrance. At this point, it had been anchored to an outcrop on the floor of the tunnel. From there, it continued low along the left-hand wall before disappearing around the corner.

The floor of the tunnel was covered with fine silt, piled in irregular mounds. The irregularity of the floor spoke volumes, as did the guideline, buried here and there by one of the little mounds. To Jeff, these observations attested to the complete inability of a diver to pass through this passage without massive disturbance of the bottom. Even to his experienced eyes, accustomed as they were to seeing narrow passageways, it looked pretty damn tight. Could a person actually fit through there? Would a person actually want to? Conflicting thoughts ran through his mind: there were advantages to going through first; there were advantages to going through second; there were advantages to turning around and going home.

A friend and fellow cave diver had been through just the other week and had, in fact, laid the line that Jeff was now staring at. He had been very excited by his friend’s talk of an incredible spherical room on the other side of this restricted passageway, a room never before seen and not indicated on any available map of the complex cave system. Jeff had been in rooms of almost every size and shape, but never in a sphere. Truly, that would be a sight to see. However, maybe his friend had been joking. Maybe, he had come down here with a bow and arrow and shot a line through this horridly cramped tunnel. Then again, maybe there was an incredible spherical room on the other side. Maybe, it was the only such room in the world. Jeff turned slightly to his side and peered upwards along the length of the monolith, which now towered above him. It was like a huge, dark sentinel, guarding the cave’s lower passages from all but the most determined of visitors. Indeed, fewer people had been to the newly discovered lower sections of this cave system than had stood on the surface of the moon; fewer still had been beyond this particular point.

Turning his attention back to the tunnel, Jeff studied the passage configuration. It seemed just high enough for a person to fit through wearing back-mounted 100s, but wide enough for only a single diver at a time. A diver using a side-mount rig would never fit.

Because the tunnel was so narrow, it would be impossible to turn around if a problem developed. But it did look as if he would still be able to back out—albeit not without considerable difficulty—if he really had to. He didn’t think he would get wedged in. For all practical purposes, however, once he started into the passage, he would essentially be committed until he reached the other side.

According to the hand-drawn map he now held, the left hand turn was approximately at the halfway point. So, it wasn’t a very long passage. The other option would be to actually remove his tanks and push them through in front of him. His regulator hoses were long enough to permit this. In fact, this is what his friend had done the first time through. However, this was not an action to be taken lightly. Removing one’s tanks to fit through a small passageway carried significant risks of its own. Besides, on a second dive through the restriction, his friend had been able to negotiate the passage using back-mounted 100s without significant problem.

Once he entered the passage, he’d be engulfed in blinding sediment. His visual world would disappear. Warren would never even have the opportunity to see the tunnel. So, he floated back up to the top of the monolith and motioned for Warren to go down and take a look before he went through. Warren returned a minute later, signing hand jokes about getting stuck.

Jeff floated back down to the opening and then eased his way into the restriction. He could hear his air tanks occasionally bang against the ceiling as he carefully threaded inch by inch his way through the tunnel. They also clanged along...
the walls, since there was but a few inches of clearance on each side. His chest was at least three inches deep in the silt and his knees dragged along the bottom. He was pushing with his legs and inching his way forward on his arms. He felt less like a scuba diver than like an infantryman struggling across a mud-soaked battlefield.

Meanwhile, he was also aware of the fact that both his pulse and respiratory rate had begun to climb. The huge cloud of silt and the claustrophobic nature of such a confining passage were powerful stimulants. But there was no fear, no panic in Jeff. There was only the rush of the moment. Like so many others who engaged in extreme activities, Jeff and Warren were adrenalin junkies. They craved the stimulation of extreme exploration. But, they were not thrill-seeking daredevils with a death wish—a fact that friends and family and even the public-at-large often misunderstood.

Jeff didn’t swim so much as slither and crawl through the confining tunnel. As he struggled along, silt poured out into the main passage behind him. It flowed around the base of the monolith, covering their jump line, their clip, and threatening to float up to Warren on his rocky balcony. He was sure Warren watched with great interest as the puffy clouds floated up and about him in great gobs, reducing visibility in the main tunnel also.

There was now nothing to be seen in the darkness of the narrow tunnel. Visibility was non-existent. There was only the diffuse yellow glow of his light, providing some measure of warmth and imagined security; his fingers loosely cradled around the guideline; the clatter of his tanks against the wall; the feel of the soft mud between his fingers; and the thought—no, the hope—that eventually he would break out into clear water.

In a short time, Jeff felt the floor disappear from beneath him and he realized that he had passed out of the tunnel and was in “open water” again. He continued following the line, his fingers lightly curled about it, carefully adjusting his trim and buoyancy to remain alongside of it.

After a few moments, he began seeing the wispy clouds that told him he was moving out of the silt storm. Still following the line, he finally moved out into clear water. Turning around, he could see a great cloud of silt pasted against the wall and, a few minutes later, watched Warren miraculously emerge through it, as though by spontaneous generation.

And to their complete amazement, they were, indeed, in a huge spherical room. It was perhaps as much as 30 or 40 feet in diameter. The guideline continued to the far side of the room, where it was anchored to a rocky projection on the wall. The room was a remarkable place and Jeff felt as though he was in the center of a ping-pong ball of stupendous dimensions. But the brightly reflective yellow walls so characteristic of the outer reaches of the system were gone. This was a dark and dismal place. There was no warmth here and this room stood in marked contrast to the magic present in other chambers they had been through. Perhaps, this is what the heart of an anthill really looked like.

On the far side of the room, a narrow slot in the floor opened into a deep shaft. Peering into the slot, he could see no apparent bottom and had no intention of swimming down to look for one. Shining his light into its depths, it simply ran out of beam before finding anything to reflect its glow. Had the walls been lighter in color, he might have found a floor. It was as though his light had simply been swallowed up by the darkness.

Discouraged by his puny efforts to probe the shaft, Jeff finned back into the center of the sphere. He was nearing the limits of his air supply. Continued exploration of the pit would have to wait for future trips and would require elaborate staging preparations, with multiple air tanks placed at intervals along the route.

Just then, a light began flickering on the wall in front of him. It was Warren, now floating directly above him, signaling for his attention. As Jeff turned to face him, Warren pointed at his air-pressure gauge and gave Jeff a thumbs-up signal. He had reached his air turnaround point. It was time for them to leave. Time to go back to the world.

A slowly expanding cloud of silt obscured the location of their exit tunnel. Somewhere along the wall, in the midst of the cloud, was the narrow tunnel and their only exit out of this ghoulish ping-pong ball. By fumbling blindly along the wall, they might never have found the tunnel entrance. However, the guideline was a slender nylon highway that led them directly to the opening.

Jeff followed Warren along the line until he was lost in the cloud and then his eyes followed the soft glow of his friend’s light until that too was gone, and he knew that War-
Jeff let his light play along the walls of this great hollow ball, soaking in one last look to fill his memory, before he, too, passed into the mass of swirling silt and the cave was gone from sight. Once again, the clatter of his tanks, the diffuse yellow glow, the gurgling of his exhaust bubbles, and the line slipping through his fingers were the only discernible realities. And suddenly, without warning, the glow was gone. Jeff’s light had unexpectedly been snuffed out. He’d passed through a lot of caves with that light and now it had deserted him, leaving him alone in a most desolate place.

With some difficulty, he managed to clip the hand piece onto his harness. He continued on in a darkness absolute. Not even the comforting glow of his watch and gauges could be seen in the silt-laden water. When he re-gained the monolith, he would be able to reach back to get a secondary light. Warren was waiting for him on top of the rock. Jeff swam up to meet him, guided by the light cast from Warren’s still fully functional primary lamp and by the line, which he carefully cradled in his fingers.

From their vantage point atop the monolith, the divers could survey the silt storm they had caused. Jeff estimated that they would have to swim at least 40 or 50 feet down the passageway before the cloud would begin breaking up. He considered whether or not he should retrieve his gap reel or just leave it in place and come back for it some other time. In the absence of any real problems, however, he decided to carefully reel in the line and take it with him. Following the line back to the T-junction, Warren felt along the take-off until he found the line marker. He then carefully proceeded a few yards along the guideline and waited for Jeff. Jeff, in turn, reeled in the gap line as he sank slowly to the T-junction. Then he unclipped the gap reel, carefully stowed it away, detached the line marker, and then followed Warren along the guideline they had come in on.

For the first few minutes, they moved along in a blinding silt storm, their fingers lightly clasped around the line. After 45 feet or so, the silt began dissipating. As the cloud of silt dispersed, visibility improved sufficiently to enable them to follow the line visually, although they would have to stay close to it for another 60 or 70 feet. With the ever-improving visibility, they now began to make good time in their unhurried retreat from the cave, as they followed the guideline through the caves many twisting passages.

Strangely, the passages didn’t look at all familiar to Jeff. At first, he thought that they had made a mistake. Despite their careful planning, could they have been swimming in the wrong direction after all? But, he quickly realized that he was merely seeing the cave with a different set of eyes—eyes born of a backup light many times dimmer than his primary had been. It was a bizarre effect, but they were not lost.

As the divers passed once more through the gallery’s submerged “chapel,” a loud bubbling noise caught Jeff’s attention. An O-ring—a small pressure-sealing gasket that helped to seal the first stage of the regulator—had blown out on one of Warren’s tank valves. A flood of small bubbles filled the passageway and then raced to the ceiling of the cave, as his precious air began to leak away in a great hissing surge. Although he could still breathe through the offending gear, his air supply would be seriously depleted if the leak were not stopped quickly.

With practiced skill, Warren quickly shut down the malfunctioning system and switched to his backup regulator. Actually, he had lost very little air and since both his primary and his backup regulators drew air from both tanks, he still had access to his complete air supply. The probability of his remaining backup system failing, as well, was remote. Should it be needed, however, Warren would be able to breathe from Jeff’s backup regulator once his own malfunctioning gear had belched the rest of his life-sustaining air into the water around him. They each carried a regulator with an extra-long hose for use in just such an emergency. If it had been necessary, they could even have buddy-breathed swimming single-file through the restriction.

The nature of diving in the overhead environment is such that all critical safety equipment must have a built-in redundancy. In the unlikely event of serious equipment-related failures, this is a keynote to diver security. They had had two unexpected failures so far on this dive. Such failures are not particularly common, nor are they particularly rare. They are merely part of the process of cave diving and something that is always planned for. Had they occurred earlier in the dive, the dive would have been aborted. As it was, they occurred on the way out and proved to be little more than slightly bothersome. As the two divers continued on, however, Jeff glanced back at the rock-hewn altar of this submerged cathedral. Perhaps, this was the stuff of which underground prayers were born.

To Be Continued...
The Underground Movement

Volume 17, Number 8

CALENDAR OF EVENTS

PHOTOGRAPH OF THE MONTH

August 2017

CENTRAL CONNECTICUT GROTTO

CALENDAR OF EVENTS

August 26: Monthly Grotto Meeting. Please see the grotto website (www.caves.org/grotto/ccg/) for additional details.

August 27: Tory’s Cave Sinkhole Cleanup. Please contact Bob Simmons (vicepresident@necaveconservancy.org) for additional information.

August 31 - September 4: Old Timer’s Reunion (OTR). Dailey, West Virginia.


Photograph of the Month - When caving gear is left on the line to dry for too long a time. Photo by Nathan M. Appel.