



BREAKDOWN

Volume 35, Number 3, January 2021

The *MAR Breakdown* is the journal of the Mid Appalachian Region of the National Speleological Society. It is published three times a year; prior to the annual business meeting and prior to the Spring and Fall field meets.

Subscriptions-

Event notices and MAR Breakdown newsletters are distributed electronically. When you attend a field meet, the email address provided on your registration form is added to the distribution list. You may also add yourself to distribution by going to <http://eepurl.com/P2f5j> and completing a short registration form.

Meetings and Meets-

The annual business meeting is held the last Saturday in February. Each spring and fall there is a field meet. Watch for dates.

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MAR BUSINESS MEETING SET FOR FEBRUARY 27, 2021 PCC MEETING TO FOLLOW

**Due to COVID-19 concerns, The Mid Appalachian
Region Business Meeting will be held virtually on
Feb 27, 2021 at 1:30 p.m.**

**You will find additional information and
instructions on page 2**

**A meeting of the Pennsylvania Cave
Conservancy (PCC) will follow the MAR
Business Meeting**



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MAR BUSINESS MEETING

February 27, 2021 at 1:30 pm

Virtual Meeting via Zoom

Due to the ongoing COVID-19 pandemic, all in-person MAR meetings and field meets are suspended until further notice. We will return to live MARs as soon as it is safe to do so!

In the meantime, the MAR business meeting will be conducted virtually via Zoom (see information below). All MAR members are welcome to attend!

MAR/PCC Meeting Link:

<https://psu.zoom.us/j/92867734359>

Meeting ID: 928 6773 4359

Dial in: 301-715-8592

2021 Spring MAR-VAR Postponed

After discussions among members of the Seven Valleys and Charlottesville hosting grottos, we regret to announce that the planning committee members have decided to postpone the 2021 Spring MAR/VAR until Spring of 2022 due to the continued instability surrounding the COVID-19 virus and related restrictions. While the introduction of a vaccine provides some hope of improvement in the future, it seems doubtful that conditions will be improved enough to host a field meet this Spring. We look forward to seeing all our caving friends once conditions finally improve. Until then, take care of yourselves and stay healthy! More details will be posted on the web site as they become available:

<https://mar.caves.org/fieldmeets.htm>

or

<http://var.caves.org/index.php/events/spring-var>

MAKC Purchase of Penn Aqua Cave



The Mid-Atlantic Karst Conservancy recently purchased Penn Aqua Cave in Mifflin County, PA. This is probably the premier water cave in the state.

The Pennsylvania Cave Conservancy is proud to launch a fundraiser to aid MAKC with their costs associated with the recent acquisition of Penn Aqua Cave. PCC is sponsoring a Go Fund Me fundraiser to and will match all donations up to \$3,000. Anything above \$3,000 will not get the matching funds, but will happily be sent along to MAKC. Donations are tax deductible.

The link to access the Go Fund Me site is:

<https://www.gofundme.com/f/makc-purchase-of-penn-aqua-cave>

PCC Officer Elections

There will be a PCC meeting February 27, 2021 following the MAR Business Meeting. It is at this meeting that PCC officers are elected. Anyone wishing to run for office can put their name on the ballot by contacting any PCC officer.

Cave conservation and protection can only happen if we all work together towards the same goals.
Get involved with PCC!

Caving Safely, Having Fun, and Surveying Lots of Cave: The Story of “Team Sarah” and the Sarah Furnace Cave Survey

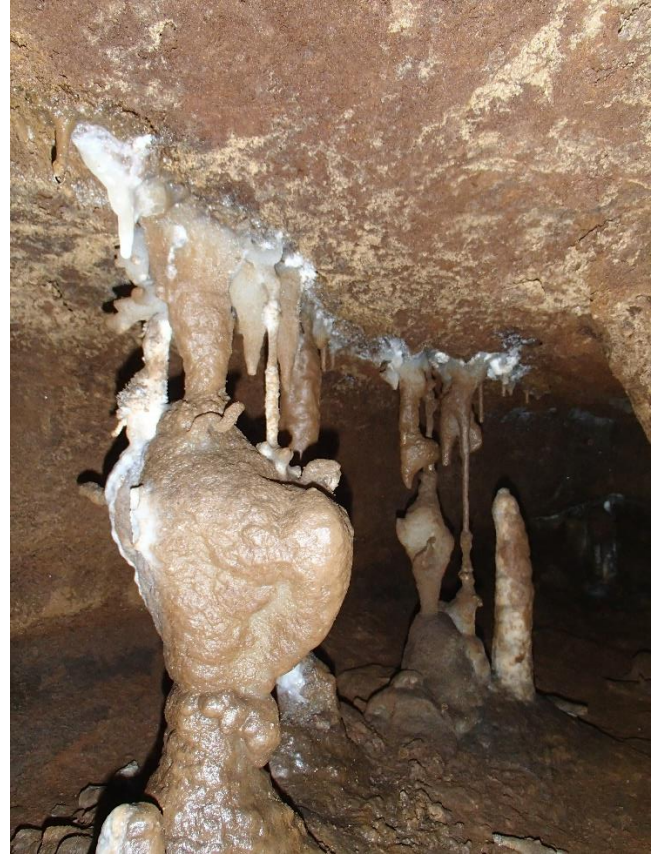
by Bert Ashbrook

For nearly 70 years, cavers have known that Sarah Furnace Cave was a big cave. But no one knew *how* big. There had never been a map of the cave, and no one had ever claimed to have reached the end of the cave. So in 2019, after the Mid-Atlantic Karst Conservancy acquired the cave, a group of cavers set out to completely explore and map Sarah Furnace Cave. This is their story.

Geologic Background. Sarah Furnace Cave is one of western Pennsylvania’s classic Vanport Limestone maze caves. Here, the limestone is flat-lying and overlain by one to two feet of Buhrstone iron ore. Three sets of joints in the rock have been enlarged by dissolution at the contact between the limestone and the ore. These form an intricate network of crawlways averaging 2-3 feet high with clay floors and iron ore ceilings. In places, all three sets of joints form passages spaced every ten feet, resulting in one of the densest maze caves on earth. Will White has theorized that periodic flooding from the nearby Allegheny River (when it was hundreds of feet higher than today) was responsible for the dissolution that formed the cave.

Mining History. Sarah Furnace Cave is named after the nearby iron furnace that operated from 1860 to 1867. The furnace itself was named for Sarah Power Plumer, wife of the original furnace owner. Fuel for the furnace came from the Lower Kittanning coal found about 40 feet stratigraphically above the cave, which was deep mined and made into coke for the furnace. A separate and unconnected deep mine was used to extract the other major ingredients used in iron making: iron ore and limestone flux. The iron miners followed Sarah’s joint-controlled cave passages, enlarging them as they went and removing the ore from the ceiling. The mine tunnels are easily distinguishable from the natural cave passages; they are stoopways made wider and taller by the removal of the limestone and ore. They often contain mine gob and sometimes have mine timbers, stone support pillars, and unstable ceilings. Today, the furnace itself is long gone,

but one of the iron mine drifts serves as the cave’s only entrance.



*Heart-Shaped Column in Sarah Furnace Cave
(photo by Jeff Jahn)*

Mineralogy. Despite the mining and over a century of spelunker visits, Sarah remains well-decorated for those willing to stray off the beaten path. In addition to common calcite formations (flowstone, stalactites, stalagmites, columns, etc.), the cave contains gypsum and gypsum needles, aragonite and aragonite needles, helictites, anthodites, manganese dioxide crust on the rim of pools, and a variety of very weird looking materials that we think must come from the iron.

Biology. Sarah Furnace Cave is thought to have been a significant bat hibernaculum, before White Nose Syndrome. Now, the bats are outnumbered by the porcupines who use the cave. Their hystricine droppings appear to support a food chain within the cave. Dr. Hazel Barton of the

University of Akron has already conducted a microbiology study in the cave, and MAKC hopes to host other scientific studies of the cave once the pandemic is past.



*Gypsum Needles in Sarah Furnace Cave
(photo by Ed Epp)*

Previous Survey Attempts. Will White's *Caves of Western Pennsylvania* characterized Sarah Furnace Cave (then known as Porter's Cave) in this way: "[T]he areal extent of the cave[] is not known, and although one may find ends to specific passages, the 'end' of the cave is not, at present, definable . . . it is possible to crawl for several hours without crossing one's path." In the 1980s, Northwest Pennsylvania Cave Survey leader Ed Frank estimated that the cave had nearly 40 miles of passage, based on a 10-foot by 10-foot grid of passages covering a 1000-foot by 1000-foot area. Until recently, that was the only information known about the extent of the cave.



*Chris Hill, Bert Ashbrook, Hunter Wodzinski, Johanna
Neller in Sarah Furnace Cave
(photo by Hazel Barton)*

Surveying Sarah's small crawlways is no piece of cake. In the 1950s, the Pittsburgh Grotto attempted to survey the cave using Bruntons, but the attempt failed due to suspected magnetic anomalies from the iron ore. In the 1980s, the Northwest Pennsylvania Cave Survey made perhaps the most progress of any mapping project, but in the end the cave proved too complex and the project failed to attract enough surveyors. Another small group tried to survey the cave in the early 1990s, but their failure was likely due to the scale of the project and access problems. As a result, there has never been a map of Sarah Furnace Cave despite nearly 70 years of exploration by organized cavers.

The Cave is Saved. Kim and Tom Metzgar had had their eye on Sarah Furnace Cave for nearly 40 years. In 2019 a new landowner was willing to subdivide the surrounding 201-acre parcel, and the Mid-Atlantic Karst Conservancy was able to purchase 20 acres of land including the cave entrance. The Mid-Appalachian Region of the NSS made a major donation toward that purchase. MAKC named the property the Barbara Schomer Preserve, after a dedicated volunteer and supporter. Since its purchase, MAKC has adopted a management plan for the Preserve (see it at karst.org) and has begun making surface improvements. The Commonwealth has plans to reclaim an area of the preserve that was surface mined for coal.

"Team Sarah." MAKC wanted a better understanding of the cave resources it had purchased. Key to that understanding would be a map of the cave, which would require a new survey effort. Although access to the cave would no longer be a problem, the new surveys would still need to address the other issues that had stymied prior mapping attempts: Sarah's size and complexity, finding enough surveyors, and keeping them coming back. It was plain that mapping her seemingly endless maze of interconnected crawlways would be too big a project for any small group to finish. Instead, the survey would need to recruit many cave surveyors for a sustained, years-long, effort. But there are few cavers (let alone cave surveyors) in and around northwestern Pennsylvania, so the survey would need to recruit more broadly, and would

need to turn sport cavers into cave surveyors. Even then, we would need to keep cavers coming back to a convoluted maze where they would spend hours on end crawling without the ability to even stand up. “Team Sarah” was created to address these issues.

Solving Problems. It’s easy to get cavers excited to come and see a big cave that has only recently been opened for access. Team Sarah has leveraged that enthusiasm by never running tourist trips. If cavers want us to take them in the cave, it has to be on a survey trip. And we don’t accept any excuses: if you didn’t know how to survey, we’ll teach you! To be sure, that survey training has made for some low-survey-footage trips, but those trips are an investment in the project’s future: many formerly new surveyors now form the core of Team Sarah. Loaning new surveyors our personal Distos has also been key, because struggling to learn to read a Suunto in a crawlway will often guarantee that a new surveyor will never return.



*Team Sarah Sketching Seminar, Tom G., Eric S., Amanda S., Christian G., Johanna N., Dwight L., Aron S., Bert A., Red S., Cole Y., Dave F., Caitlin C., Hazel B., Katie S.
(photo by Dwight Kempf)*

Getting cavers to come survey is only half the battle. Team Sarah uses several techniques to keep them coming back, eventually turning them into project cavers. One way is to follow a “survey as you go” ethic. No one gets to “scoop” unsurveyed passage. That way, every survey team gets the thrill of pushing the map beyond where it’s ever been, instead of only doing “mop-up” survey. Another way is producing a working map after every trip, so that surveyors can see the

progress that they are making. The working map has the added benefits of helping us navigate through the maze, and of helping to find tie-in stations for each successive survey. Another motivator is friendly competition with other caves to be the longest in the state -- size matters to Team Sarah! Finally, we prioritize having fun over getting lots of survey complete.

Team Sarah soon had lots of surveyors, but that led to a new problem: our chronic shortage of good sketchers. On-the-job training and shadowing produced several good sketchers, but not enough to satisfy the demand. So in 2020, we held a full-day sketching seminar, including “classroom” sessions and in-cave exercises led by experienced “instructors.” Our nine new sketching “graduates” have alleviated or sketched shortage.

As momentum built, Team Sarah ran into another problem: a lack of survey instruments. Even with all of Team Sarah members’ personally-owned Distos, Suuntos, and Bruntons (yes, we even resorted to using Bruntons!), we still had trips where there were not enough instruments to go around. The solution was applying for grants from the NSS Sara Corrie (U.S. exploration) Fund and the Cleveland Grotto Science Fund. With their help, we have purchased four DistoX2 instruments for use in the project. Rumor has it that Santa Claus also delivered new Distos to several Team Sarah members.



*Jeff Jahn sketching on BAB survey
(photo by Hunter Wodzinski)*

MAKC and Tom Metzgar serve a critical role as Team Sarah's surface support crew. They have fixed the access drive so that we can get cars closer to the cave entrance. MAKC permits Team Sarah to camp on the preserve. And most impressively, Tom (with occasional volunteer help) has constructed a switchback trail to the entrance that replaced a steep, slippery, handline trail that was genuinely dangerous in the rain and snow.



*Hunter Wodzinski in the Root Room 2, Sarah Furnace Cave
(photo by Hazel Barton)*

COVID-19 has been one of Team Sarah's most difficult challenges. For three months in the spring of 2020, we shut down the project, until MAKC allowed a restricted reopening. As we were adjusting our trips to those restrictions, the pandemic worsened in the fall of 2020 and we were forced to adapt again. Our current approach, informed by consulting with MAKC and Team Sarah member Dr. Hazel Barton, is to allow trips by self-selected "survey pods." These are groups (relatives, household members, coworkers, or

friends that monitor each other's quarantine exposure) that have chosen to accept the risk of caving with one another. Per MAKC rules, survey pods do not congregate with other pods while in the cave.

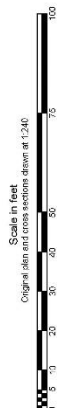
To be sure, the pandemic has hurt our ability to welcome new cavers to Team Sarah. But by the same token, it has made Team members cherish the chance to go caving and surveying. Indeed, on our most recent trip, we put five survey pods into the cave, and had a record-breaking day for survey footage.

Results. MAKC's "Team Sarah" has made over 50 survey trips into the cave in less than two years. More than 70 different cavers have participated, many of whom we have taught to survey and to sketch. We've taken over 2800 survey shots, with an average shot length of 8.1 feet. Sarah Furnace Cave has now reached 3.6 miles of survey, and a vertical extent of 20 feet. That is good enough to be the third longest in the Commonwealth (for the moment), behind Laurel Caverns (4.1 miles) and behind Sarah's Vanport cousin, Harlansburg Cave (4.8 miles). With over 100 going leads, we won't stay number three for long!

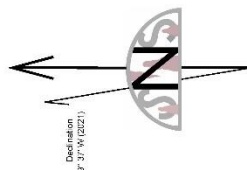
Team Sarah expects to welcome more cavers to the fold once the pandemic restrictions are lifted. Meanwhile, email caving.ashbrook@comcast.net if you want to join our listserv.

Barbara Schomer Preserve
Clarion County, Pennsylvania
Sheet 1 of 2

41° North, 76.5° West, 1200 feet elevation
Working map version 045h, revised January 29, 2021
Surveyed by members of Team Sarah
from March 2019 to January 2021
with DistoX2 and Suunto instruments
Current surveyed length: 17,571 feet (3.3 miles)
Current surveyed depth: 20 feet
© 2021 by Bert Ashbrook



Entrance



Dedication
3" 3/4" W4 (2021)

Match at top border of sheet 2

Match at top border of sheet 2

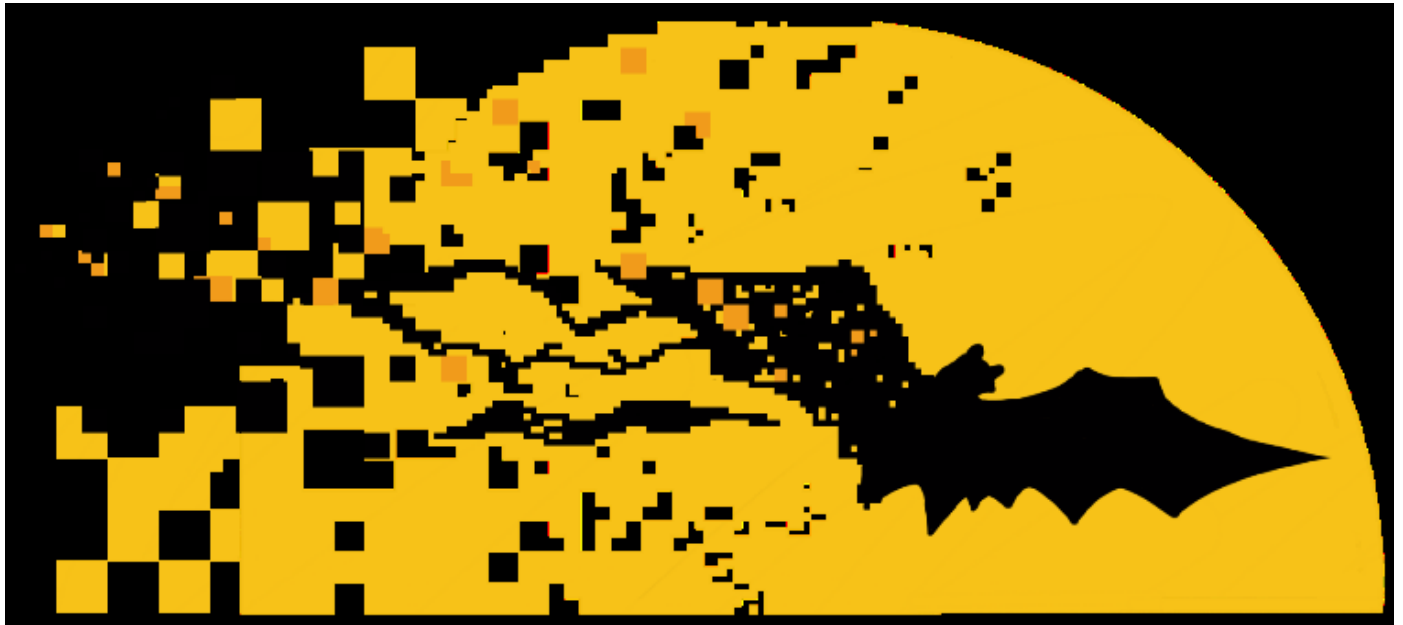
The survey of Sarah Furnace Cave is a project of the Mid-Atlantic Karst Conservancy. M.A.K.C. owns and has permanently protected the cave as part of its Barbara Schomer Preserve. For more information or to see about visiting the cave, go to www.karst.org.



Team Sarah

[illegible]

Financial support: National Speleological Society (Sara Corrie Memorial Fund), Cleveland Grotto (Science Fund), Tom Metzgar



Virtual Topics in Cave Rescue presented by the NSS February-May, 2021

Presentations on the second and fourth Wednesday evenings February through May. Topics include patient perspectives, rescue pre-planning and operations, patient management, hazardous atmospheres, rescuer care, and more. Register for the Zoom presentations (register once for all sessions). Talks will be recorded and available on the NSS YouTube channel.

Join over 25 speakers to help refresh your cave rescue perspective!

[Register!](#)

<https://us02web.zoom.us/meeting/register/tZEpf-GgpjouHdwIdzOugQThZebcwV8tsUGU>

Upcoming Events

- 2021 MAR Annual Business Meeting** February 27, 2021
 Virtual Meeting via Zoom at 1:30 pm EST
 URL: <https://psu.zoom.us/j/92867734359>
 Meeting ID: 928 6773 4359
 Dial in: 301 715 8592
- 2021 NSS Convention** June 28 –July 2, 2021
 Weed, CA
 80th Anniversary
 URL: <http://nss2021.caves.org/>
- Karst-O-Rama** August 13-15, 2021
 Great Saltpetre Cave Preserve
 Mt. Vernon, Kentucky
 URL: karstorama.com
- Old Timers Reunion (OTR)** Sept. 2-6, 2021
 OTR Site/Campgrounds
 Dailey, WV (Randolph County)
 URL: www.otr.org
- '21 Fall MAR Field Meet** Fall 2021
 Location: TBD
 Hosted TBD
 URL: <https://mar.caves.org/fieldmeets.htm>
- '21 Fall VAR Field Meet** Fall 2021
 Location: TBD
 Hosted TBD
 URL: <http://var.caves.org/index.php/events>
- '21 Bridge Day** TBD 2021
 New River Gorge Bridge
 Fayetteville, WV
 URL: www.bridgeday.info/
- National Cave and Karst Management Symposium (NCKMS 2021)** November 1-5, 2021
 San Marcos, TX
 URL: symposium2021.nckms.org
- 2022 MAR Annual Business Meeting** February 26, 2022
 Mt. Laurel Church of God
 1295 Piketown Road, Linglestown, PA
 URL: <https://mar.caves.org/busnmtg.htm>
- '22 Spring VAR/MAR Field Meet** Spring 2022
 Grand Caverns
 Grottoes, VA
 Hosted By: Seven Valleys Grotto and Charlottesville Grotto
 URL: <https://mar.caves.org/fieldmeets.htm> -or-
<http://var.caves.org/index.php/events/spring-var>

NSS MEMBER PRICE LIST

Effective October 2018

MID-APPALACHIAN REGION BULLETINS (including reprinted Bulletins)

1-4	Bulletins Caves of Shippensburg Area #1-4	REPRINT	7.00 + postage A
5	Caves of Western PA:	REPRINT 29 caves, 19 maps	8.00 + postage A
6	Caves of S. Cumberland Valley	REPRINT 93 caves 69 maps+6 large maps	17.00 + postage B
7	Caves of Fulton Co., PA	Revised/Corrected 4 caves, 4 maps	5.00 + postage A
8	Caves of Blair Co., PA	REPRINT 89 caves, 40 maps	7.00 + postage A
9	Caves of Huntingdon Co., PA	REPRINT 94 caves, 36 maps	10.00 + postage B
10	Caves of Snyder Co., PA	20 caves, 14 maps	6.00 + postage A
11	Caves of Centre Co., PA	71 caves, 56 maps+1 large map	10.00 + postage B
12	Caves of Mifflin Co., PA	47 caves, 31 maps+5 large maps	10.00 + postage B
13	Caves of Perry Co., PA	13 caves, 6 maps	10.00 + postage A
14	Caves of Bucks Co., PA	REPRINT 24 caves, 6 maps	5.00 + postage A
15	Caves of Lehigh Co., PA	REPRINT 25 caves, 13 maps	6.00 + postage A
16	Caves of Northampton Co., PA	24 caves, 13 maps+1 large map	6.00 + postage A
17	Caves of Northumberland Co., PA	20 caves, 10 maps	5.00 + postage A
18	Caves of Berks Co., PA	64 caves, 32 maps	10.00 + postage B
19	Caves of Bedford Co., PA	54 caves, 33 maps	7.00 + postage A
20	Caves of Westmoreland Co., PA	337 caves, 187 maps/10 large maps	29.50 + postage C
21	Karst of Sinking Valley and Kookan Cave Huntingdon and Blair Counties	103 pages with color photos , 4 fold-out maps, 2 large maps	27.50 + postage B
22	Caves of Middle Susquehanna Valley	140 pages with color photos	16.00 + postage D

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