CENTRAL
OKLAHOMA
GROTTO
OF THE NATIONAL
SPELEOLOGICAL SOCIETY,INC

C.O.G.nizance

Inside this Issue

The November meeting will be Friday, November 11, 2016 at 7:00 p.m. The meeting will be at the home of Matt Brasher.

ANNOUNCEMENTS

*Northwest trips are scheduled the third Saturday of every month. Contract Sue or John Bozeman for details.

*The November meeting will be Friday, November 11, 2016 at the home of Matt Brasher.

WHITE-NOSE SYNDROME DECONTAMINATION PROTOCOL, APRIL 2016

This is the latest formal revision of the national decontamination protocol to prevent spread of the fungus that causes white-nose syndrome. This document is the product of a collaborative effort with multiple federal and state agencies and several non-governmental organizations.

Go to this website to view the detailed suggestions listed to help stop the spreading of WNS.

https://www.whitenosesyndrome.org/news/national-white-nose-syndrome-decontamination-protocol-april-2016

For the latest information about WNS visit this site:

https://www.whitenosesyndrome.org/

MINUTES

CENTRAL OKLAHOMA GROTTO
Minutes of the meeting of October 14, 2016

Host: the home of Art Wallace
Attendees: Art Wallace, Dale Amlee, Anne Ault, John and Sue Bozeman, John Talbot, Carol and Dale Town, John and J.T. Van Dyke, Jon and Kelley Woltz, S. Beleu

The Honorable Dale Amlee began the meeting at 8:03
OLD BUSINESS
Sue reported that she had sent to BCI the bat count intel that they had requested.

NEW BUSINESS
None

THE MEETING'S LOWLIGHT
I'm not sure how I did it, but during the meeting I fell out of my chair sideways onto the floor. No one pushed me or pulled my chair out from under me. I simply oodled over onto the floor.

TREASURER'S REPORT
John Talbot gave his reports for July/August, September, and October.

We concluded the meeting sometime after 8:17

TREASURER'S REPORTS

November 2016 TREASURERS'S REPORT

INCOME			**EXPENSES**
Dividends	$	00.01	
TOTAL	**$**	**00.01**	
CASH ON HAND	**$**	**190.62**	Balance as of **11/3/2016**
CHECKING	**$**	**336.91**	
SAVINGS	**$**	**2,138.58**	
TOTAL	**$**	**2.666.11**	

PREPARED BY TREASURER JOHN TALBOT

SUZNUZ

We appreciate the condolences and cards. And for those who are unaware of Dad's passing, that he died in his sleep, peacefully, at the age of 95 -- having stayed mentally sharp and able to drive and live independently to the end.

TRIP REPORT

There were no trip reports submitted for this newsletter.

POTPOURRI

Scattered marine cave biodiversity data to find home in new database WoRCS, Project Report

Date: September 13, 2016 Science News https://www.sciencedaily.com/releases/2016/09/160913124715.htm?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+sciencedaily%2Fearth_climate%2Fcaving+%28Caving+News+--+ScienceDaily%29

Considered "biodiversity reservoirs," underwater caves are yet to be explored with only a few thoroughly researched areas in the world. Furthermore, species diversity and distributional data is currently scattered enough to seriously hinder conservation status assessments, which is of urgent need due to planned and uncontrolled coastal urbanization.

Thereby, a large international team of scientists, led by Dr Vasilis Gerovasileiou, Hellenic Centre for Marine Research, Greece, have undertaken the World Register of marine Cave Species (WoRCS) initiative meant to aggregate ecological and geographical data to eventually provide information vital for evidence-based conservation. Their Project Report is published in the open access journal *Research Ideas and Outcomes* (RIO).

With more than 20,000 existing records of underwater cave-dwelling species spread across several platforms, the authors have identified the need for a new database, where a standard glossary based on existing terminology binds together all available ecological data, such as type of environment, salinity regimes, and cave zone, as well as geographical information on the distribution of species in these habitats.

In their project, which has already produced a dynamic webpage, the scientists work within the context of the World Register of Marine Species (WoRMS) to add the already available records published in peer-reviewed outlets to reliable and case-by-case verified unpublished data, available from offline databases, museum collections and field notes, as well as the findings of the WoRCS thematic editors themselves.

Eventually, these presence records could be georeferenced for submission to the Ocean Biogeographic Information System (OBIS) and constitute an important dataset for biogeographical and climate change studies on marine caves and anchialine systems.

To invite both the marine biology scientific communities and citizen scientists, WoRCS is meant to adopt a number of strategies.

Short and mid-term plans to engage the scientific community include development of common projects on poorly known marine and anchialine caves; projects that use WoRCS data; initiation of a fellowship programme to engage young researchers; and work with societies.

In the meantime, WoRCS is also intended to develop educational, citizen science and conservation activities, by creating products (e.g., maps, guides, courses) for the public, engage volunteers to encode data, and develop tools for MPA managers and the conservationist community.

"In particular, each time that a project about caves is funded, a work package or module or deliverable about WoRCS should be included to employ students and young researchers for data encoding, or to facilitate new types of data, or new links to other e-infrastructures and data tools," suggest the WoRCS thematic editors.

Beneath This Medieval German Town Lie Over 25 Miles of Forgotten Tunnels

By Jennifer Nalewicki
smithsonian.com
September 7, 2016

On the surface, Oppenheim looks like your typical German town resting along the banks of the Rhine River. But there's more to Oppenheim than beer halls and a Gothic-style cathedral from the Middle Ages. Beneath its narrow cobblestone streets lies something deeper—an entire labyrinth of tunnels and cellars.

"The town is practically honeycombed with cavities," Wilfried Hilpke, a tour guide with Oppenheim's tourism office, tells Smithsonian.com.

Hilpke should know. For the past ten years, he's spent much of his time leading hour-long hardhat tours of Oppenheim's elaborate tunnel system, taking visitors

(Continued on page 4)

through a journey that covers just a fraction of the 25 miles of known tunnels residing beneath the surface. (It's believed that there could be more than 124 miles of tunnels underneath the town, which is located 30 miles southwest of Frankfurt. However, many sections remain uncharted; they are thought to lead to private cellars beneath residents' homes.)

Not only are the Kellerlabyrinth tunnels long in distance, but their history is equally deep. According to Hilpke, some of the oldest tunnels date back to 700 A.D. The tunnels got their start as food and wine storage cellars, and workers carved out the bulk of them using pickaxes and shovels during the 1600s, when residents were in need of extra storage space and channels to transport goods like wine. The tunnels took on a secondary purpose when the city's inhabitants used them to hide from Spanish troops during the Thirty Years' War. (They also used them to store Katharinenkirche cathedral's stained glass windows to protect them during that war's bombardments.)

"Since the town was completely destroyed [during the 1689 War of Palatine Succession] by order of Louis XIV of France, it went under and never recovered as a commercial town," Hilpke says. "No cellars were built after that time because they were not needed any longer." Oppenheim was considered a free imperial city around this time, which allowed it to be self-ruled and have some autonomy, but also resulted in it being a target to outside forces.

After that tragic time, only a few hundred residents returned to Oppenheim to rebuild, filling the tunnels with dirt and debris during the reconstruction. Over the centuries the tunnels were largely forgotten, but in the 1980s a police car sunk into the roadway during a storm, revealing one of the hidden tunnels and jogging residents' memories.

Although the topsoil that's found throughout Oppenheim is predominately comprised of loess, a silt-like sediment that's stable under normal conditions, it lost its stability due to moisture and lack of ventilation in the tunnels below, causing that section to cave in, which led to the almost miraculous discovery.

Beneath the loess sits limestone, "which you can practically dig using a tablespoon," says Hilpke. He demonstrates by dragging his finger across one of the tunnel walls, causing a trail of dust. "It's easy to dig, but also very solid. As long as it doesn't get too moist, a herd of buffalo could walk over it."

Over the years, people have unearthed artifacts that trace back to some of Oppenheim's earliest inhabitants, such as utensils, shards of pottery and a rusted first aid kit, which are on display in a glass case as part of the tour. All told, the Kellerlabyrinth tour travels through five levels, all of which stay at a comfortable 60 to 66 degrees Fahrenheit year round, and include visits to a giant hall built in the 1940s that once served as a reservoir. Another room, called Rathaus-Keller (meaning "city hall basement"), has the telltale signs of once being a wine cellar due to blotches of black mold on the stone walls, the result of the aging process. Today, the room can be rented out for weddings and is often used as a practice room for choirs thanks to its optimal acoustics. And come Halloween, local residents transform it into a haunted house for kids.

Though interconnected cellars can be found in other wine-making regions, Oppenheim's miles of tunnels are something unique—one of Europe's most elaborate, and the only such system in Germany. "I wouldn't be surprised if the tunnels are here 500 years from now," Hilpke says. The real question is whether Oppenheim's residents will forget (and rediscover) them again over the centuries.

Read more: http://www.smithsonianmag.com/travel/exploring-underground-tunnels-oppenheim-germany-180960147/#XERVjl6cg7yatZQM.99

Fire clues in cave dripwater
Researchers find wildfire signatures in cave formations for the first time
Science News July 21, 2016

When mineral-rich water drips from a cave's ceiling over centuries and millennia, it forms rocky cones that hold clues to Earth's past climate. Now, researchers in Australia and the UK have found that these structures can also help trace past wildfires that burned above the cave. Their research is published in *Hydrology and Earth System Sciences*, an open access journal of the European Geosciences Union (EGU).

Pauline Treble, a researcher at the Australian Nuclear Science and Technology Organisation and the University of New South Wales, Sydney, first got interested in Yonderup Cave as an archive of past climate. She wanted to find out whether this shallow cave system in southwest Australia was a good site to reveal past changes in rainfall and temperatures.

"We monitored two drips in the cave expecting to see responses in the data that we could attribute to climate. But the results were surprising," says Treble. The chemistry of the dripwater, and how it changed over time, was different in the two sites. The data could not be showing a regional climate change at the surface, but rather a local change that affected the ground above the two sites in different ways.

"This is when we started to consider whether the intense wildfire that had occurred six months before monitoring started was responsible for the inconsistent data," Treble explains.

Treble's student Gurinder Nagra, from the University of New South Wales, was excited by the idea of finding traces of wildfires in cave dripwater. "Not only does this open up a new avenue for the fire community, but it could hold the key to our understanding of fire and climate in the past, and how this influences our warming world," he says. *(continued on page 5)*

But the signal that wildfires leave in cave formations can also present a problem, because it is remarkably similar to the signal for a change in climate.

Stalagmites (which grow from the ground up) and stalactites (which hang from the ceiling) form when water at the surface seeps through the soil and drips into underground chambers over hundreds or thousands of years.

The dripwater contains minerals, which can gradually accumulate to form icicle-like rocky structures that preserve environmental information from the water within its growth layers. By looking into the chemistry of these growth layers, scientists can find clues about how rainfall and temperature were changing above ground when the water dripped into the cave. Due to the way stalagmites and stalactites grow, the layers in the middle of these structures preserve older environmental information, while those closer to the surface hold clues to the more recent past.

Oxygen is one of the key elements scientists look at to track past climate change. Specifically, they measure changes in the ratio (noted δ18O) of two oxygen isotopes: the heavier 18O, which takes more energy to evaporate, and the lighter 16O. Roughly speaking, a higher ratio signals warmer temperatures and less rainfall.

At Yonderup Cave, the researchers collected dripwater samples from two sites from August 2005 to March 2011 and analysed them for δ18O, as well as for trace metals such as magnesium. They then compared the oxygen isotope ratio in Yonderup dripwater with that predicted by a model (which simulated the dripwater δ18O based on measurements of rainwater δ18O), as well as that measured at a different cave in the region. They found that the oxygen isotope ratio in Yonderup dripwater was 2‰ (2 parts per thousand) higher than expected.

"This value means that the water was enriched in the heavier 18O isotope by two-parts per thousand," Treble explains. "This may not sound like much, but if we were interpreting this change in a stalagmite record [of past climate], it would be equivalent to some of the largest interpreted climatic changes seen in the Quaternary record [the last 2.6 million years]."

Treble says the results could have implications for interpreting δ18O in fire-prone regions, such as Australia or the southern Mediterranean. A change that could be due to a local wildfire in the land above the cave could be wrongly attributed to a change in regional or global climate.

The *Hydrology and Earth System Sciences* study highlights the need to carefully interpret dripwater cave data, and to also look into changes in its trace metals, as opposed to only δ18O, when analysing it. But it also shows that we can learn more about Earth's past than we previously thought. "Our results show for the first time that wildfire changes cave dripwater chemistry, and this chemistry will be preserved in stalagmites," says Nagra.

SPELEOLOGICAL AND CAVING TERMS BEGINNING WITH THE LETTERS 'N' AND 'P'

P	E	G	P	H	P	P	E	N	D	A	N	T	Q	X
L	C	N	R	E	A	I	N	A	P	P	Y	C	O	V
U	N	A	U	N	H	T	P	K	V	O	I	P	P	H
N	E	H	S	O	O	C	G	E	P	T	W	E	O	C
G	C	R	I	Z	E	H	L	D	A	H	U	N	L	R
E	S	E	K	C	H	D	Z	E	P	O	H	D	Y	A
P	E	V	K	I	O	Z	R	O	E	L	P	U	M	L
O	R	O	N	T	E	H	E	F	R	E	I	L	O	A
O	O	N	O	A	P	H	G	F	M	L	S	I	R	R
L	H	N	T	E	B	G	A	R	E	R	O	T	P	U
Q	P	T	H	R	X	T	S	O	A	A	L	E	H	T
N	S	T	J	H	K	I	S	P	B	E	I	O	S	A
D	O	J	E	P	P	P	A	E	L	P	T	U	B	N
N	H	J	W	U	V	H	P	R	E	B	E	L	Q	P
K	P	P	A	L	A	E	O	N	T	O	L	O	G	Y

NAPPY
NATURAL ARCH
NOTHEPHREATIC
OFF ROPE
OVER HANG
PAHOEHOE
PALAEONTOLOGY
PASSAGE
PEARL
PEANDANT
PENDULITE
PERMEABLE
PHOSPHORESCENCE
PHREATIC ZONE
PIPE
PISOLITE
PIT
PITCH
PLUNGE POOL
POLYMORPHS
POTHOLE
PRUSIK KNOT

Central Oklahoma Grotto is a nor -profit organization and a chapter of the NSS (National Speleological Society), Cave Avenue, Huntsville, AL., 35810. Dedicated to cave conservation and safety, C.O.G. published general information in a monthly newsletter ($6.00/year) and detailed cave surveys and related Speleological items in a yearly publication, The Oklahoma Underground ($3-$8/issue) Membership is by sponsor and is $12 per year for adults, $6 for spouses and students, and $3 if under 18. Central **Oklahoma Grotto meets once a month on the second Friday of each month. For information, write Lil Town, 25692 Mosier Circle, Conifer, CO 80433: All submissions to the newsletter should be sent to the editor:** Lil Town, 25692 Mosier Circle, Conifer, CO 80433: Telephone: (580)471-1238: E-mail: cavemoose@gmail.com. The deadline for submissions for any particular mont 's issue is the 20th day of the previous month. If you wish material returned. Please include a SASE with submission. All materials in this newsletter is available for reproduction, provided proper **credit is given with the article when you print it. Trade publications are welcomed.** ***Cave softly and safely!*** Website: http://www.okcavers.co

The November meeting will b
At the house of Matt Brashe
Friday, November 11, 2016.

Central Oklahoma Grotto
Mud & Ink Presses Div.
2119 Holly Oaks Lane #283
Weatherford, TX 76087