



Minutes of the Kansas City Area Grotto
November 2020 Business Meeting
Tuesday, November 17, 2020 – 6:30 to 8:00 P.M.
Meeting Held Remotely Via Zoom

The meeting was called to order by president Seth Colston. The following members and guests were present: Seth Colston, Jim Cooley, Jodi, Julie Cottrell, Ginny Friedrich, Bill Gee, Jennifer Gleason, Kristen Godfrey, Rick Hines, Emmet Jaynes, Laura Jaynes, Jodi, Jay Kennedy, Nick Kennedy, Sara Taylor, George Tengel, Hou Zhong

Presentation:

Bill Gee gave our first presentation in some time, a talk on battery comparisons with an emphasis on rechargeable batteries.

Batteries, Bill explained, aren't created equal: There is a lot of variation, especially for 18650 lithium ion batteries. To quantitatively compare different brands of batteries, Bill built a test rig out of an old Raspberry Pi computer connected to a homemade voltmeter. This setup's measurements are as precise as ± 0.000125 volts, and the rig can measure up to 4.096 volts.

The best way to compare batteries is to measure how long a battery will run. Most batteries are measured in milliamp hours (mAh), which not the same as either power or energy; instead, it is the amount of electric current delivered over a period of time. (18650 and AA batteries have different voltages, meaning they can't be compared with mAh, so Bill uses Watt-hours instead to compare between the two).

The mAh capacity of a pack of batteries depends on how they're connected: If the batteries are connected in parallel, the mAh rating of each battery can be added. If they're connected in series, the mAh of the pack is the rating of one battery. However, Watt hours can always be added, whether the batteries are in serial or in parallel.

The amount of energy that a battery can deliver depends on how fast it's discharged: A higher discharge rate means that less energy is delivered, which is why batteries in series or in parallel are better than individual batteries.

Based on his experiments, Bill has learned that most 18650 batteries are made out of "snake oil." Almost all 18650s available on Amazon are cheap Chinese products with wildly inaccurate ratings. Many say that they are greater than 3,400 mAh, which is impossible for the technology. One quick way to determine whether your online-purchased 18650 batteries are well-made is to weigh them: A good 18650 should be 45 grams; any less, and there is likely extra unused space inside the casing. If in doubt, a name brand (Sony, Sanyo, etc) should generally be good.

NiMH (AA or AAA) batteries, on the other hand, are usually much closer to the stated ratings. AA batteries are usually 2000-2400 mAh, and AAA are generally around 750 mAh; any more than this, and the battery falls apart. Like with 18650s, name brand NiMH batteries, like Eveready, Sanyo, and Panasonic, are better.

Overcharging batteries can be dangerous: Lithium ion batteries can explode if overcharged, and 18650s can split at the seams. To avoid problems, invest in a good charger.

Over-discharging can also be an issue. If a battery is run down too far, its polarity will be reversed and it won't be able to be charged back up again. This happens most easily with batteries wired in series, but batteries in parallel are not immune. Over-discharging isn't a problem with dry cells, on the other hand, since they aren't rechargeable. To give a visual cue, most lights reduce brightness after around 70% of the charge has been used, and some, like Princeton Tech lights, flash when low. Other lights, though, like Bill's Sten light, will happily run a battery down to zero.

Self-discharge is when a battery gradually loses its charge without being used. All batteries leak, but good quality lithium ion batteries, for instance, will leak much more slowly (3% per month) than bad quality ones (30% per month).

Using his testing rig, Bill compared two 18650s: a Garberiel, which he expected to be made of "snake oil", and a rechargeable purple battery of unknown brand. The purple battery ran around three times longer than the Garberiel battery despite having a lower mAh rating: The Garberiel delivered 3.2 Watt hours, while the purple delivered 10.6.

He also compared four AAs: Everready, Eneloop, and Amazon brand NiMH rechargeable batteries, as well as an alkaline dry cell. The Eneloop didn't perform as well (1797 mAh) since it was older, and the alkaline declined quickly (18885 mAh), but the Everready (2041 mAh) and the Amazon (2278 mAh) did well.

Finally, Bill tested two AAA batteries. The Eneloop did slightly better than the alkaline in this category.

In conclusion, it's important to shop very carefully for 18650s; one source that Bill recommends is www.18650battery.com. Bill's tests also highlight the fact that a good rechargeable NiMH can deliver more energy than alkaline batteries, but a set of four NiMH AA batteries can deliver about the same amount of energy as one good 18560.

Officer Reports:

President: Seth has a trip scheduled for scouts from Belton in May and would appreciate help with the trip.

Vice President: Jim has been "busily scheduling trips and cancelling them" due to unfortunate weather conditions. The Slough Bottom Cave trip was cancelled due to snow, and the Cloud 9 trip was cancelled due to extreme cold.

Treasurer: Membership dues were due beginning on January 1st and will be overdue at the end of March. Dues can be paid online via Paypal on the grotto's web page (kcgrotto.caves.org) or can be mailed to Bill Gee.

January beginning balance = \$2768.87 (Commerce Bank)

Deposit = \$

Checks = \$

Debit card = \$

Bank fee = \$5.00

End balance = \$2763.87

Income:

Dues - \$

Apparel = \$

Expenses:

Bank fee = \$5.00

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January beginning balance = \$1179.82 (Paypal)

Merchandise purchase = \$10.00

Dues = \$52.50

Fees = \$2.58

End balance = \$1239.74

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January beginning balance = \$67.00 (petty cash)

End balance = \$67.00

Secretary: The January meeting minutes were accepted. I (Ginny) will be moving out of town this year, most likely in May, so anyone interested in picking up the position of secretary from May to the end of the year is encouraged to contact Seth or me.

Quartermaster: No updates. As always, Seth can be contacted about any equipment.

Novice Trip Coordinator: No updates.

Fundraising: No updates. Contact Seth Colston (swcy92@gmail.com) or Bill Gee (bgee@campercaver.net) for more information.

Presentations: A fair number of people have postponed presentations until they can be held in person, so KCAG is in need of presenters for future meetings. Please contact Seth Colston at swcy92@gmail.com if you are interested in giving a meeting presentation or have a topic idea. Since all meetings will be held remotely for the foreseeable future, Seth suggests that future presentations should be in the half hour range rather than an hour long.

The Guano: Julie Cottrell will start redesigning the *Guano*, the KCAG's publication, from scratch. She will start small, most likely with quarterly editions distributed via PDF. Seth is interested in hearing what people want from the *Guano*. Julie would greatly appreciate any submissions, long or short.

MeetUp: There have been few events on MeetUp since there have been no recent open-invitation novice trips, but Seth (swcy92@gmail.com) can still be contacted for any trips to add to the MeetUp schedule.

White Nose Syndrome: See <https://caves.org/WNS/> for the most current map of the spread of WNS.

International Year of Caves and Karst (2021): Contact Seth Colston if you have ideas presentations or want to lead a trip in 2021.

Organization Updates:

NSS: The NSS convention in 2021 may be virtual like the 2020 convention; the decision will be made around May. If it is virtual, the date may be moved by one week to avoid conflicting with the convention of the International Congress of Speleology.

Carroll Cave Conservancy: Bill heard from a woman named Julie who has worked previously with Vona Kuczynska and who is interested in carrying out studies on the bats in Carroll Cave. Specifically, she aims to perform isotope analysis on the formations and/or drill cores from the guano piles. Rick plans to contact the Pembertons and inquire again about access to the natural entrance for professional researchers.

Missouri Speleological Survey (MSS) and Missouri Caves and Karst Conservancy (MCKC): Apart from the notice that the MSS January meeting has been cancelled, Jim has heard no news about either organization. (Late breaking news: There will be an MSS project weekend at Lake of the Ozarks State Park June 4th-6th. The meeting will be held on Sunday June 6th at 10:00 a.m. at the park.)

Project Updates:

Hickory County: Seth and Gary planned to go ridge walking in a conservation area near Geronimo Cave to search for caves, but this trip was cancelled due to weather.

Cloud 9 Ranch: Lee Krout was not present, but Jim noted that the Cloud 9 bat census trip had been cancelled due to inclement weather. Jim and Julie will likely visit in the future to do map QC, which may be combined with a novice trip. Jim has been getting a lot of work done on the Cloud 9 cartography lately.

Stark Caverns Survey Project: No trips are currently planned, but Bill is considering leading some in the summer. Smaller cavers will be preferred.

Geronimo Cave: No updates.

Devil's Icebox: There may be some trips in April for pink planarian counts.

New Membership Nominations: None.

Trip Reports and Other News: Only one trip occurred in the previous month: a survey trip at Stallcup Cave. On January 22nd, Matthew Hernandez and Seth drove down and camped at the Carroll Cave silo. Over the following two days, Seth, Matt, Kirsten Alvey-Mudd, Tyler Skaggs, and several other people split into groups of three and finished several hundred more feet of survey. Seth reported that they had a thoroughly pleasant talk with the landowner. Seth and Jim will look at the survey data from this trip and then plan for QC work.

New Business: Now that the upcoming trip list is published on the grotto website, Bill will no longer be emailing monthly updates. The online list will be updated regularly as things change.

Unfinished Business: Seth Colston confirmed that there was no unfinished business, and the meeting participants chatted briefly before disconnecting.

Upcoming Trips and Events

COVID-19 update: Check with the trip leader before you set out to attend any of these events. Many of the “stay at home” restrictions have been lifted. Restrictions or not, please make your own decision regarding your health. The caves are not going anywhere.

February 16, 2021 – KCAG grotto meeting

Zoom URL is <https://us04web.zoom.us/j/268089722>

March 16, 2021 – KCAG grotto meeting

Zoom URL is <https://us04web.zoom.us/j/268089722>

2021 April 23 to 25 – Spring MVOR

Ruby’s Landing at Waynesville, MO

For details email to self.caver@gmail.com

2021 May 23 – TENTATIVE! Celebration of Life for Pic Walenta

2pm to 5pm at The Legacy at Green Hills

10243 North Green Hills Road in Kansas City, MO

Social distancing will be in place

The family wants to display some caving memorabilia. Let Seth know if you have anything

The date for this event is likely to change, so keep checking back.

2021 June 28 to July 2 – NSS National Convention in Weed California

<http://nss2021.caves.org/>

2021 July 23 to 29 – 18th International Congress of Speleology

Lyon, France. <http://uis2021.speleos.fr/>

2021 July either 24 or 31 – Annual members meeting of Carroll Cave Conservancy

Place and time are not yet determined. This will probably be a Zoom virtual meeting.

2021 Fall MVOR – To be determined.

2021 October - Cave gating project on large gray bat maternity colony, in western Camden County, Missouri. Date not yet determined. Contact Jim Cooley for more information.

2022 – NSS National Convention in the Black Hills of South Dakota

Probably June or July

2023 – NSS National Convention in Elkton, West Virginia

This is a retry of the canceled/online 2020 event

Dates are not yet determined.