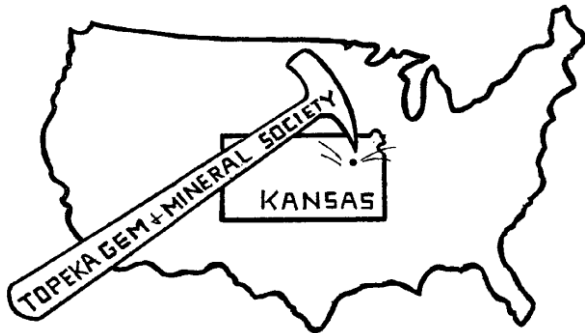


The Topeka Gem and Mineral Society, Inc.
 1934 SW 30th St. Topeka, KS 66611
 Rock2Plate@aol.com

THE GLACIAL DRIFTER



www.TopekaGMS.org or
 Facebook: Topeka Gem and Mineral Society Field Trips

The Topeka Gem & Mineral Society, Inc.
 Organized December 3, 1948

Member of Rocky Mountain Federation of
 Mineralogical Societies American Federation of
 Mineralogical Societies



The Glacial Drifter, Vol. 64, No. 7
 July 2021



The Purpose of the Topeka Gem & Mineral Society shall be exclusively educational and scientific: (1) to promote interest in geology and the lapidary arts; (2) to encourage the collection and display of rocks, gems, and minerals; (3) to encourage field trips and excursions of a geological, or lapidary nature; and (4) to encourage greater public interest and education in gems and minerals, cooperating with the established institutions in such matters.

Meetings: 4th Friday of each month, September to May, 7:30 pm, University United Methodist Church, 1621 SW College, Topeka, KS 66604. No meeting in December unless notified of a change. Picnic meetings are held, June, July and August.

Dues: Individual, \$15.00; Couple, \$20.00; Junior (under 18 years of age), \$5.00. Dues are collected in December for the following year. Send dues to: **Millie Mowry, Treasurer, 1934 SW 30th St, Topeka, KS 66611.**
www.TopekaGMS.org

2021 OFFICERS AND CHAIRS

President	Brad Davenport	379-8700	Cab of the Month	Debra Frantz/Fred Zeferjohn	862-8876
1 st Vice Pres.	Will Gilliland	286-0905	Field Trip Coord.	Will Gilliland	286-0905
2 nd Vice Pres.	Cinda Kunkler	286-1790	Publicity	TGMS Board	
Secretary	Stacy Haug	1-857-3350	Welcome/Registration	Harold Merrifield	633-9745
Treasurer	Millie Mowry	267-2849	Property	M. Cote/D. Dillon	220-3272
Directors	Chuck Curtis	286-1790	AFMS Scholarship	Cinda Kunkler	286-1790
	Francis Stockton	913-645-7677	Editor/Exchange Editor	Millie Mowry	267-2849
	Dave Dillon	272-7804	Show Chairman	Dave Dillon	272-7804
Historian	Open		Show Dealer Chairman	Dave Dillon	272-7804
Federation Rep	Chuck Curtis	286-1790	Show Secretary	Cinda Kunkler	286-1790
Corporation Agent	Millie Mowry	267-2849	Jr. Rockhound Leader	Jason Schulz	640-6617
Librarian	Millie Mowry	267-2849	Show Case Coordinator	Cinda Kunkler	286-1790
Web Master	Jason Schulz	640-6617			

Area Code for all numbers is (785).

EXCHANGE BULLETINS WELCOME

For exchange newsletters contact the club via mailing address listed above or email at rock2plate@aol.com .
Permission is granted to reprint articles only if proper credit is given to the author, Glacial Drifter and the date.

Ramblings from your President.

Howdy one and all.

I hope that July is treating you well. Moderate temps and adequate rainfall seem to be making this month much more pleasant than what we might think is normal here in NE Kansas. Crops and gardens are looking great. Friends are eating their first tomatoes and sweet corn from their gardens, rewarding them for their efforts this spring.

I helped a young 4-H girl on Saturday identify some rocks and minerals for her upcoming county fair. I was rewarded with a dozen nice big roasting ears picked that morning from her grandfather's fields. They were wonderful and very appreciated.

We have about six new members that have signed up since last month. Great young folks. Please spend some time with them and make them feel welcome and important.

This Saturday morning at 8:30 or so we will be going through our storage units sorting and cleaning up and digging out some cases that need some repair. Please come out and help. Bring a chair so you won't have to be standing and bending over. The more of you folks that show up the sooner we can finish our work. Hopefully before it gets too hot. Your club needs your help.

Remember that next Friday will be our second picnic/ pot luck dinner at the church. We eat at 6:30. But come around 6:00 to help set up tables and chairs and get the food set up.

Also, let's try a little rock swapping and selling. If you have some extras that you might want to swap or sell, bring them along. There will be some great materials and specimens there from some of the collections we have received. We haven't done this for a long time so let's see how it goes. Also, next week, we will be setting up a couple of tables at the Shawnee County Fair. We will be there Friday, Saturday and Sunday. 9:00 -5:00. Sunday morning, activities don't really don't get going till about noon. Here again, YOUR CLUB needs YOUR help. Plan on spending a few hours there to relieve those of us that will be there all weekend long. Nothing difficult about it. We are there just pressing the flesh trying to promote OUR CLUB. I hope to see lots of you there.

Classes at the shop have been going great with lots of folks getting involved. There have been some beautiful pieces of art produced here. The Bull sessions are my favorite part of these Tuesday evenings. Sitting around sharing stories, telling lies, looking at rocks and minerals and just in general old fashion visits are priceless treasures. Come early and stay late.

That is about all I have for this month. I am thrilled to see our club active and growing. You should be too.

Brad

Summer Time Picnics—July August

No formal meeting during these months, just a friendly pot-luck dinner among our rock friends.

Bring a dish or two to share, your own table service, soft drink. We will meet at the UUM Church at 1621 SW College, Topeka, and eat at 6:30 p.m. on the 4th Friday of the month.



TGMS Event Calendar

JULY 2021			AUG. 2021		
1	T		1	S	
2	F		2	M	
3	S		3	T	Brad's Shop OPEN 6 PM Wear Masks, have shots
4	S		4	W	
5	M		5	T	Jr. RHD's UUMC 6 p.m.
6	T		6	F	
7	W		7	S	
8	T		8	S	
9	F		9	M	
10	S		10	T	Brad's Shop OPEN 6 PM Wear Masks, have shots
11	S		11	W	
12	M		12	T	Show Committee Meeting 7pm Millie's
13	T		13	F	
14	W		14	S	
15	T		15	S	
16	F		16	M	
17	S	Cleaning Storage Shed 8:30 a.m.	17	T	Brad's Shop OPEN 6 PM Wear Masks, have shots
18	S		18	W	
19	M		19	T	
20	T	Brad's Shop OPEN 6 PM Wear Masks, have shots	20	F	
21	W		21	S	
22	T		22	S	
23	F	POT-LUCK PICNIC 6:30 P.M. UUMC Shawnee Co Fair at Manor Conference Center 9-6 pm	23	M	
24	S	Shawnee Co Fair at Manor Conference Center 9-6 pm	24	T	Brad's Shop OPEN 6 PM Wear Masks, have shots
25	S	Shawnee Co Fair at Manor Conference Center 9-6 pm	25	W	
26	M		26	T	
27	T	Brad's Shop OPEN 6 PM Wear Masks, have shots	27	F	POT-LUCK PICNIC 6:30 P.M. UUMC
28	W		28	S	
29	T		29	S	
30	F		30	M	
31	S		31	T	Brad's Shop OPEN 6 PM Wear Masks, have shots

If you are interested in Wire Wrap Classes, contact Millie, 267-2849 or rock2plate@aol.com

Check out the calendar on our web site www.TopekaGMS.org

JR ROCKHOUND Classes & Reminders

Here are reminders of the next few months of classes: **University United Methodist Church, 1621 SW College Ave., Topeka, KS.** Sign in starting at 6:00 pm and classes starting at 6:30pm. 1st Thursday of each month.

<https://www.facebook.com/TopekaGMSJuniorRockhounds>

To register for the Junior Rockhounds or any of the classes, email:

Jason Schulz at: Fleetcommander@att.net



---Everyone must wear masks!

Next Class: Aug 5 , Instructor

Reminder: If you want to earn the patches from the classes that you have attended you need to turn in your homework assignments.

Come one, come ALL to our summer picnic meetings! July date is the 23rd, we eat at 6:30. Please bring a dish to share with others, your own plates, table service and drink. We will have a guest speaker and a rock swap, as well as 'show & tell'. Juniors & Parents - please come so the youth have a chance to get acquainted with other club members. One of the badges they need to complete is "Reaching Across Generations", the only 'class' for this is for the Junior (along with your parent) to spend at least six hours with a senior member. What a perfect time to meet and make a new friend - at the picnic! The August picnic will be August 27th. Hope to see you at either or both of these events! Please be thinking about setting up an exhibit for our show October 9 & 10 - 'Green with Envy' is our theme this year. Please let me know if you would like have a case to display your collections at the show. We are hoping for several cases with a **Green** theme - you might be surprised at how many you actually have.

Thank you all - Cinda Kunkler cindakunkler@att.net

Welcome New Members:

Sammy L. Wall
Leigh Ann Harjo
Robert "Cole" Collins
Bailey Gardner
Travis Petefish
Doria Skinner

We need your **BEST CHOICE UPC Labels --**
Bring them to the monthly meeting, and give them to Cinda Kunkler.



Will Gilliland, reminds the members that they can display in the open fair classes at the Shawnee County Fair.

Did you ever hear of ALUNOGEN?

Did you know it came from Colorado?

By DGMG Editor Beth Simmons

WHAT IS ALUNOGEN?

Alunogen (1834, from the French “alun”=“alum”; “gène”=produced by)(fig. 1), also called “feather alum” or “mountain butter,” is colorless to white (although often colored by impurities, such as iron substituting for aluminum). Like gypsum, the crystals of this hydrous aluminum sulfate mineral are fibrous to needle-like. Its chemical formula $Al_2(SO_4)_3 \cdot 17H_2O$, is nearly the same as Halotrichite, which carries iron and more water. The original reference to this mineral occurring in Colorado came in 1905 from early mineralogist William P. Headden, once president of the Colorado Scientific Society. He found the mineral in abundance along the North Fork of the Gunnison River at Doughty Springs and Alum Gulch, in the Dakota formation. W.H. Hobbs also reported alunogen from Cripple Creek in a very brief analysis of specimens in the University of Wisconsin collection, the same year (Hobbs, 1905).

WHERE WAS “DOUGHTY SPRINGS”?

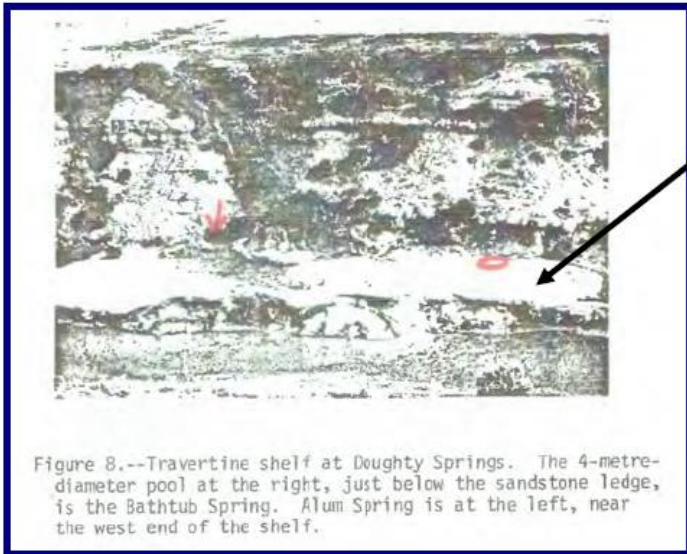
In 1905 when Headden wrote his report (complete with photographs), he said Doughty Springs, named for the property owner, weren't known publicly. They still aren't. Even though USGS geologists used the name in 1976, Google Earth didn't recognize the name, but did find Alum Gulch, which flows into the North Fork of the Gunnison **about 15 miles east of Delta** (fig. 2). The dismal landscape as originally shown by Headden (fig. 3, remember this was 1905!) shows a level layer of “sinter” or crystallized spring deposit. In their report in 1976, USGS geologists identified the “sinter” deposit as travertine (fig. 4). Similar “sinter” surrounds the geysers of Yellowstone.



Fig. 1. Alunogen
Photo from Wikipedia



Fig. 2 The sinter (travertine) shelf, very much still visible along the north side of the North Fork of the Gunnison River. Alum Gulch flows into the river at the yellow placemark. (Google Earth)



Figs. 3 & 4 Sinter (travertine) deposit at base of cliff at Doughty Springs, 1905 above; 1976 left.

HOW MANY SPRINGS WERE THERE?

Headden sampled **six** springs (fig. 5), five of which were named. The Black Spring, a large basin about 12 feet in diameter, was named because of a black deposit in a small section of the pool, yet it spewed out clear water (fig. 6). Chemical analysis showed its water contained ferrous sulfide with some manganese. The USGS spring samplers called the deposit simply “black metal sulfides.”

As part of rituals and ceremonies, Natives had left beads and trinkets on the bottom of the largest spring (19'X27'X2' deep) called the “Bath Tub Spring.” The Bath Tub’s opalescent waters contained “baric sulphate” (figs. 4, 5,7). The Drinking Spring (figs. 5, 8) spewed water supposedly pure enough to drink, but Headden said it tasted like a combination of hydrogen sulfide and hydrogen peroxide. The smallest spring, the Bird’s Nest (fig. 9), 18” X 24,” exuded much gas which made the water turbid. This spring had a conical deposit, an accumulation of sinter around the surrounding vegetation. The unpalatable acidic sulphate water of Alum Spring (fig. 8), tasted astringent, like its name, and had a pH of 2.9, according to the USGS. They compared the water with hydrothermal fluids in ore deposits. In a drain from the Black Spring through the Alum Spring, Headden identified unique precipitates that he called “Doughtyite.” The USGS samplers called this deposit simply “white sulfates” (fig. 7).

It took a century, but as Headden predicted in 1905, doughtyite” (synonymized with winebergite), and named for a place that no longer exists on maps, was

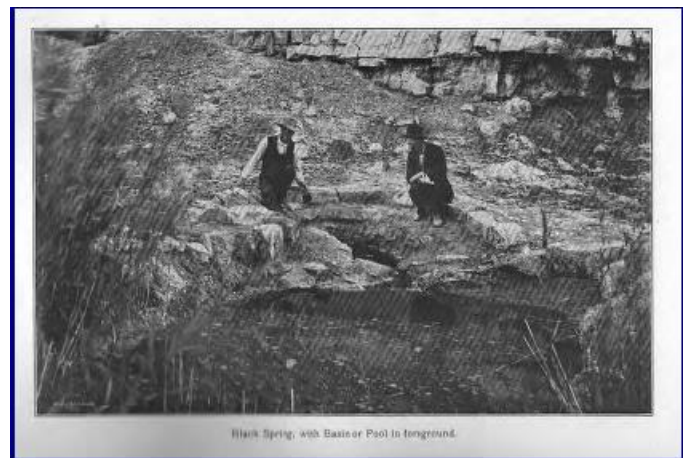
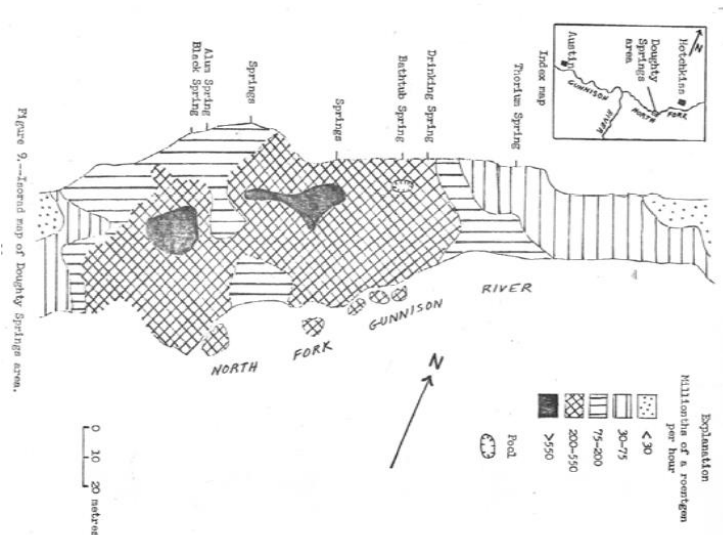


Fig. 6. The Black Spring spewed clear water into a basin about 12 feet in diameter (1905).

discredited as a valid mineral in 2006. Another rare mineral that Headden found was Mirabilite, a hydrous sodium sulfate, also called Glauber Salts.

So, what about the ALUNOGEN? The mineral occurred in three forms—massive, fibrous, and in plate-like micaceous scales, at the base of a conglomerate bed in the Dakota formation. There was a small amount of alunogen near the springs, but along Alum Gulch, which flows into the North Fork of the Gunnison River about 300 feet west of Doughty Springs, an incrusted layer coated the sandstone and holes in it for at least 35 feet above the base of the sandstone.

A massive alunogen deposit occurred there across from the mouth of Alum Gulch. There, chunks of the alunogen weighing several hundred pounds had been mined out.

WHAT WAS THE ALUNOGEN USED FOR? According to Headden, the alum in the alunogen was used in the **leather tanning process**.

The USGS water testers described and pictured a half-meter thick deposit of white powdery to crystalline crust of what they called “alunite” at the base of the Dakota sandstone in Alum Gulch, between the Morrison and Dakota formations (fig. 10). Alunite is a hydrous potassium aluminum sulfate ($KAl_3(SO_4)_2(OH)_6$, closely related to alunogen. **But** it forms in volcanic rocks, not in spring deposits, so maybe our USGS springologists should have consulted their mineralogists! This was probably the alunogen deposit that Headden described on the cliffs.

ARE THE BARIUM SALTS RADIOACTIVE?

In 1905, Headden did some testing of the sinter (travertine) deposit to see. **Indeed they**

are radioactive! In this, one of the earliest tests for radioactivity of Colorado minerals, Headden compared the radiation of concentrates from the sinter with pitchblende from the Wood Mine in Gilpin County, (as Marie Curie had used). Then he published some of the first examples of radioactive photography in Colorado (figs. 11 & 12)!

WHAT CAUSES THE RADIOACTIVITY?

In 1976, USGS geologists discerned that most of the radioactivity in the travertine at Doughty Springs comes from **radium-226**. Radium-226 is a daughter product of the breakdown of Uranium-238. The spring waters contained amounts of radium-226 equivalent to as much as 0.55 percent uranium but averaged

Figs. 11 & 12. Headden's attempts at exposing photographic plates using pitchblende from Gilpin County and barium salts from Doughty Springs and photographing the results (1905).



The Bath Tub. The Drinking Spring is shown indistinctly by the rocks to the right and in front of the cowboy.

Fig. 8. The Bath Tub and Drinking Springs (1905)

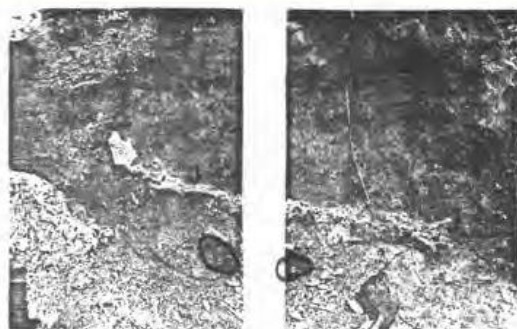


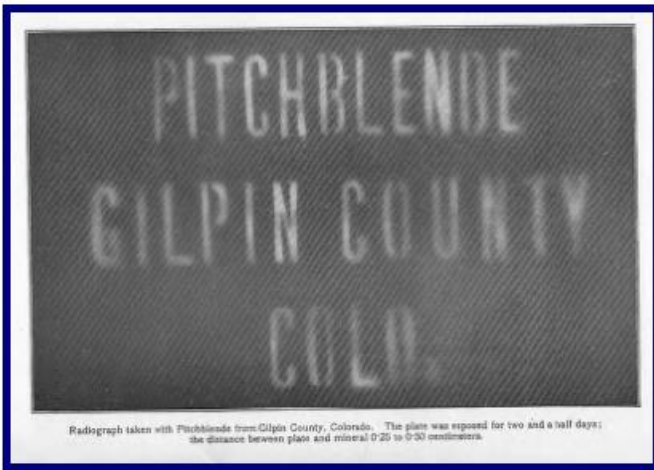
Figure 10.—Alum Spring at Doughty Springs. white sulfate precipitates (A) line the path of this acid water above point (B) where black sulfide precipitates form as a result of changes in pH and other solution equilibrium reactions. Note camera in same position in both pictures.

Fig. 8. Alum Spring at Doughty Springs. pH changes caused black metals to precipitate (1976)



Bird's Nest. Showing usual of Barium Salts.

Fig. 9. The Bird's Nest Spring (1905)



Radiograph taken with Pitchblende from Gilpin County, Colorado. The plate was exposed for two and a half days; the distance between plate and mineral 0.25 to 0.30 centimeters.



Radiograph taken with Radioactive Barite Chlorid prepared from the Barite Sinter of the Doughty Springs. Time of exposure two and a half days; distance between glass and salt, 0.25 to 0.30 centimeters. The preparation was 10 days old.

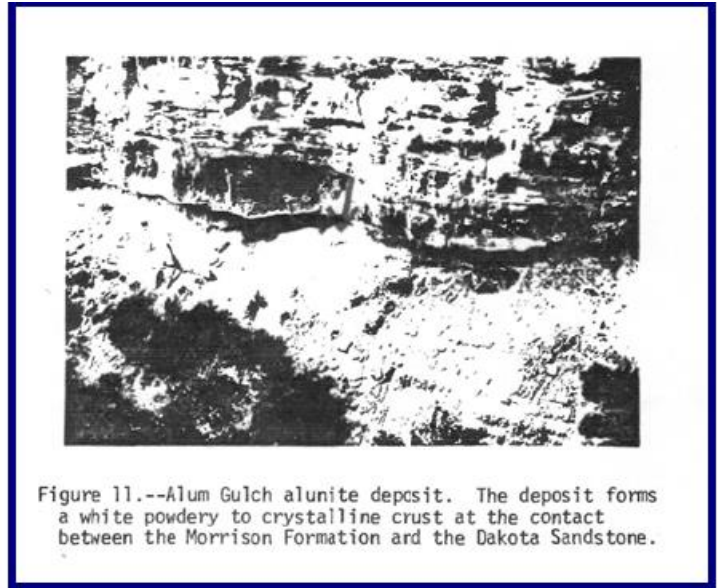


Figure 11.--Alum Gulch alunite deposit. The deposit forms a white powdery to crystalline crust at the contact between the Morrison Formation and the Dakota Sandstone.

Fig. 10. Alum Gulch "alunite" deposit (1976), probably Headden's alunogen deposit.

closer to 0.02 percent equivalent uranium. Apparently, radium co-precipitates with barite; the levels of barium were the highest of any springs in Colorado.

The researchers found that one spring exuded **Radium-228**, which is a daughter product of Thorium-

238. They called that the "Thorium Spring" (figs. 5, 13). The source rock would have had to be different for the Thorium Spring than for the other springs.

WHAT WAS THE SOURCE OF THE URANIUM OR THORIUM? No one knows! Rather than crossing a Precambrian uraninite deposit, could it have been a zone of carnotite in the Dakota Sandstone?

WHO KNOWS ABOUT SUCH THINGS?

We are fortunate to have two experts on these topics in the Denver Gem and Mineral Guild. **Pete**

Modreski can tell you more about the occurrence of alunogen in the Dakota formation right here in Jefferson County! And **Karen Wenrich** can explain the Uranium/Radium/Barium relationship, if that fascinates you. Ask them at the DGMG Picnic!

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 Pearl, Richard M., 1959, 1001 Questions Answered about the Mineral Kingdom, #57.
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 Source: Tips & Chips July 2018



Figure 12.--Thorium spring at Doughty Springs. The spring is one of numerous points of issue along sandstone bedding planes on the cliff east of the main travertine shelf. Person at lower right is pointing to spring.

Fig. 13. Thorium Spring at Doughty Springs (1976).