Friends of Mineralogy
Pennsylvania Chapter

Fall Symposium

A Virtual Online Event

Symposium for Pennsylvania Mineral Collectors

Saturday, November 7, 2020

Field Trip

Sunday, November 8, 2020

Beryl crystal, 5.6 cm, from the Newlin Township pegmatites, Chester County, Pennsylvania (see page 5). Carnegie Museum of Natural History (CM6417) William Jefferis collection 5497. *Ron Sloto photograph.*

Friends of Mineralogy

Dedicated to the advancement of serious interest in minerals and related activities

We are collectors, professionals, and curators who share a love of mineral specimens and the desire to promote understanding and appreciation of mineralogy.

FM's objectives are to promote, support, protect and expand the collection of mineral specimens and to further the recognition of the scientific, economic and aesthetic value of minerals and collecting mineral specimens.

National FM newsletters, links to other chapters, and much more can be found on their web site: **www.friendsofmineralogy.org**

Friends of Mineralogy - Pennsylvania Chapter

provides:

- the benefits of membership in the national organization
- an annual Symposium in November
- field trips
- quarterly illustrated Newsletter
- an extensive WWW site with news, downloadable books, and more

Membership application forms are available on our web site

Please explore the FM-PA web site at

www.rasloto.com/FM/

Symposium Zoom information

The Zoom link has been sent via e-mail. The session opens at 8:30 a.m.

Please join promptly so that the Symposium can begin at 9:00 a.m.

Start by muting your microphone to avoid extraneous noises in the symposium.

Please submit questions via Chat (move cursor near bottom of screen to make line of icons appear).

Professional Geologists: Professional Development Hours

Certificate for 6 PDHs available on request; contact Joseph Marchesani <jmarch06@comcast.net>.

Symposium for Pennsylvania Mineral Collectors

Friends of Mineralogy - Pennsylvania Chapter
Fall Symposium Saturday, November 7, 2020
Field Trip Sunday, November 8, 2020

SCHEDULE of EVENTS

Saturday, November 7:	**VIRTUAL SYMPOSIUM**	**page**
8:30 to 9:00 a.m.	Zoom session open - login before 9:00	**2**
9:00 to 9:10 a.m.	**Opening Remarks**	
9:10 to 10:00 a.m.	**Jeri Jones, Jones Geological Services** **Update of Some Historic and New Mineral Finds in York County, Pennsylvania**	**4**
10:00 to 10:10 a.m.	**FM-Pa Chapter Membership Meeting**	
10:10 to 10:25 a.m.	BREAK - Zoom session open for discussion	
10:25 to 11:15 a.m.	**Ryan Mathur, PhD, Juniata College** **Mineral and mining histories of Fort Roberdeau, Blair County, Pennsylvania**	**4**
11:15 to 12:05 p.m.	**Joseph Marchesani, PG** **Brief discussion of North Carolina Crabtree Emerald Mine pegmatite and comparison to Unionville, Pennsylvania, pegmatite**	**5**
12:05 to 12:30 p.m.	LUNCH BREAK - Zoom session open for discussion	
12:30 to 1:20 p.m.	**Chris Haefner** **Pequea Silver Mine (Argentiferous Galena), Lancaster County, Pennsylvania**	**7**
1:20 to 2:10 p.m.	**Peter Heaney, PhD, Penn State** **New Insights into the Growth of Hematite and Goethite**	**8**
2:10 to 2:25 p.m.	BREAK - Zoom session open for discussion	
2:25 to 3:15 p.m.	**Bill Stephens, PG, Stephens Environmental** **Field Camp, SUNY at Selkirk, 1982: Reflections of a Geologist on the Merits of Field Camp**	**10**
3:15 to 3:25 p.m.	**Field Trip Instructions**	

Sunday, November 8: FIELD TRIP to Cornwall Materials **See maps on pages 13-14**

9:00 a.m. to 1:00 p.m. **For Symposium Registrants Only.** Meet at gate by 9:00 a.m.; provide signed liability waiver prior to collecting. All standard safety protocols will be in effect. Our host will tell the group where one can go and where not to go. This will be the only collecting location on this date.

Update of Some Historic and New Mineral Finds in York County, Pennsylvania

Jeri Jones, Jones Geological Services

Jeri Jones of Jones Geological Services in Spring Grove, PA will present this program that will visit several York County classic mineral sites such as the Constitution rutile, York Haven zeolite quarry, Rossville copper roadcut and the Dillsburg magnetite deposit. Jeri will also discuss a new calcite and zinc occurrence in York County.

Biography

Jeri owns Jones Geological Services in Spring Grove, PA where he studies the geology of southeastern Pennsylvania. In his 40 years of research Jeri leads groups on field trips and acts as a consultant to several area quarries. He has traveled throughout the country conducting field trips and programs for all ages. He previously taught at HACC-Gettysburg, York College of Pennsylvania and Messiah College. He received the Digman Award for Geologic Excellence from the Eastern Chapter of the National Association of Geoscience Teachers. He has authored five books, narrated a geologic education video series and written numerous articles. Jeri also is a guest columnist for the York Daily Record/York Sunday News where he writes about local earth science. He is also the host of the popular online Zoom Rock Room where he and his co-host Savannah Conley talk about Pennsylvania geology every week.

Mineral and mining histories of Fort Roberdeau, Blair County, Pennsylvania

R. Mathur[1], J. Burns[1], L. Godfrey[2], J. Orso[1], T. Martz[1], G. Kamenov[3], J. Stuby[4], G. Pedlow[5]

1. Juniata College Geology Department, Huntingdon PA
2. Rutgers University, Piscataway, NJ
3. University of Florida, Gainesville, FL
4. ERT, Inc., Laurel, MD
5. Retired Geologist, State College, PA

In the late 1770's the Continental Congress encouraged D. Roberdeau to construct a Fort to protect the Pb based mining activities in Sinking Valley (located in Blair County). The Fort was operational for approximately two years before abandonment. In this presentation, we will review archeological and geological studies as a means to discern both recent and ancient processes. From an archeological standpoint, geochemical studies fingerprint lead bullets found in the surrounding areas and slag gravels on the current surfaces near the Fort as products of the Revolutionary mining efforts. Geophysical resistivity and GPR surveys point to mining pits that currently exist in actively farmed cornfields. From a geological perspective, the geochemistry of the ores demonstrate that the Pb and Zn mineralization process sourced deep lower crustal basement rock for metal and support new hypotheses for fluid flows and origins of metal for these deposits. The intersection of different disciplines involved in the collective work of faculty, students, industry, and the community highlights how collaborative efforts between local institutions and the community result in meaningful science for all entities involved.

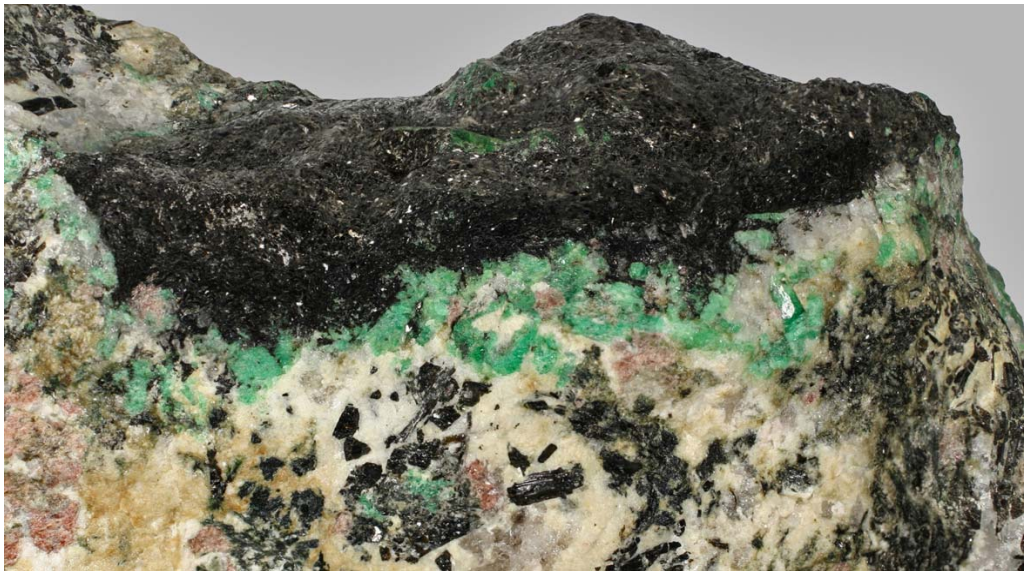
Brief discussion of North Carolina Crabtree Emerald Mine pegmatite and comparison to Unionville, Pennsylvania, pegmatite

Joseph Marchesani, PG

There are five major North Carolina Emerald Deposits recognized:

- Adams, Rist and Ellis Mines in Alexander County. Rist & Ellis combined in 1969 by American Gems. Inc., now called NAEM.
- Crabtree Emerald Mine in Mitchell County
- Old Plantation Emerald Mine (Turner Mine) in Cleveland County

We will discuss the Crabtree Emerald Mine and geology within the Spruce Pine, North Carolina, mining district. The story begins pre-Acadian with the Rodinia configuration, with ≈700m.y. gneiss formation. A granitic intrusion event into this 700m.y. gneiss, most likely related to a collision, started about 380 m.a. and is related to amphibolite grade metamorphism (maybe an asymptotic melt) of late Proterozoic (700m.a.) gneiss. Rocks melted 9-15 miles beneath surface. Very high pressures forced igneous molten rock into pre-existing rock cracks and fissures. The rock fractures opened up, contact metamorphism along with mineral rich forming fluids formed a rich melt. It took 100 million years to cool as the melt rose slowly upward (retrograde metamorphism seen with chlorite & epidote) forming large feldspars, micas and pegmatites (coarse granites). We will briefly compare structural and compositional similarities of the Crabtree, North Carolina, pegmatite to the Unionville, Chester County, Pennsylvania pegmatite.



Emerald, Crabtree Emerald Mine, North Carolina. *Richard Jacquot photo.*

Emerald, Crabtree Emerald Mine, North Carolina.
Richard Jacquot photo.

Emerald, Crabtree Emerald Mine, North Carolina. *Richard Jacquot photo.*

"Carolina Emperor" Emerald, Adams Farm, Hiddenite, North Carolina.
Richard Jacquot photo.

Also see the Chester County, Pennsylvania, beryl crystal photograph on page 1 (cover) of this program.

Pequea Silver Mine (Argentiferous Galena), Lancaster County, Pennsylvania

Chris Haefner

Hidden in the hollow hills of southern Lancaster County is the Pequea Silver Mine. This small but significant deposit of 'argentiferous galena' has been a part of Pennsylvania's history almost since William Penn first came in the late 1600s. Its history is partitive but is expressed in the first colonial 'wave' of expansion. It holds true as having a tidy role to play in Britian's French and Indian Wars of the 1750s and 1760s. It was brought to relevance again during the American Civil War during the 1860s. Significant silver was mined in the 1870s. And, from 1974 to 1987, it became a celebrated property for recreation and country-music concerts where stars performed.

I was a part of the latest chapter during the Silverford years and spent my years in exploration there, discovering previously undiscovered silver strikes, Native American artifacts and deposits that still yield massive black tourmaline crystals, quartz crystals and many rarer crystals.

New Insights into the Growth of Hematite and Goethite

Peter Heaney, PhD, Penn State

Pennsylvania boasts a proud history not only as the center of the energy transformations that fueled the growth of the US but also as a major producer of the iron that anchored the Industrial Revolution in the 19th century. By the 1850s, hundreds of charcoal iron furnaces had been erected across the state, and Pennsylvania was generating half of the national output of iron. Penn State University was built on land donated by the ironmasters of one of these, Centre Furnace, for the purpose of creating a high school, and then a college, for agriculture and mining education.

After leading field trips to some of the dozen ironworks near State College for my mineralogy students, I have wondered why multiple iron oxide minerals typically are intimately intergrown within these deposits. The most abundant of these are hematite (Fe_2O_3) and goethite (FeOOH). Geoscientists have utilized ratios of hematite-to-goethite in iron-rich sedimentary rocks to chart paleoclimates and changes in groundwater acidity. Can the intergrowth of these minerals serve as reliable proxies for global chemical cycles?

For the past five years, my graduate student, Si Athena Chen, and I have explored the crystallization of hematite and goethite using state-of-the-art laboratory techniques, and our experiments have produced several surprising results. We have synthesized a hybrid mineral that falls compositionally between goethite and hematite, and we discovered that this mineral is common in the iron deposits that formed via weathering processes in central Pennsylvania. Moreover, this mineral was discovered before - in the 1840s - by two German mineralogists working independently (Figs. 1 and 2), and their identification of "hydrohematite" was erroneously discredited in the 1920s. Moreover, Ms. Chen has demonstrated that hydrohematite, and a water-rich variant of goethite that we call "hydrogoethite", crystallize in a fashion that runs counter to classical thermodynamics. In our experiments, the two minerals precipitate from ferrihydrite simultaneously rather than sequentially, and the minerals nucleate with very high concentrations of vacancies, or missing Fe atoms. The Fe atoms fill in the vacancies as the crystals grow. These observations suggest that Fe oxide crystallization is more complex than has been appreciated.

Biography

Peter Heaney has been a professor of mineral sciences at Penn State University since 1998. He received his Ph.D. from Johns Hopkins in 1989. In 2008 he served as President of the Mineralogical Society of America (MSA).

Fig. 1 – Sample of “hydrohematite” collected in 1843 by August Breithaupt (from Mineralogical Collection, TU Bergakademie Freiberg, Germany. Courtesy Andreas Massanek)

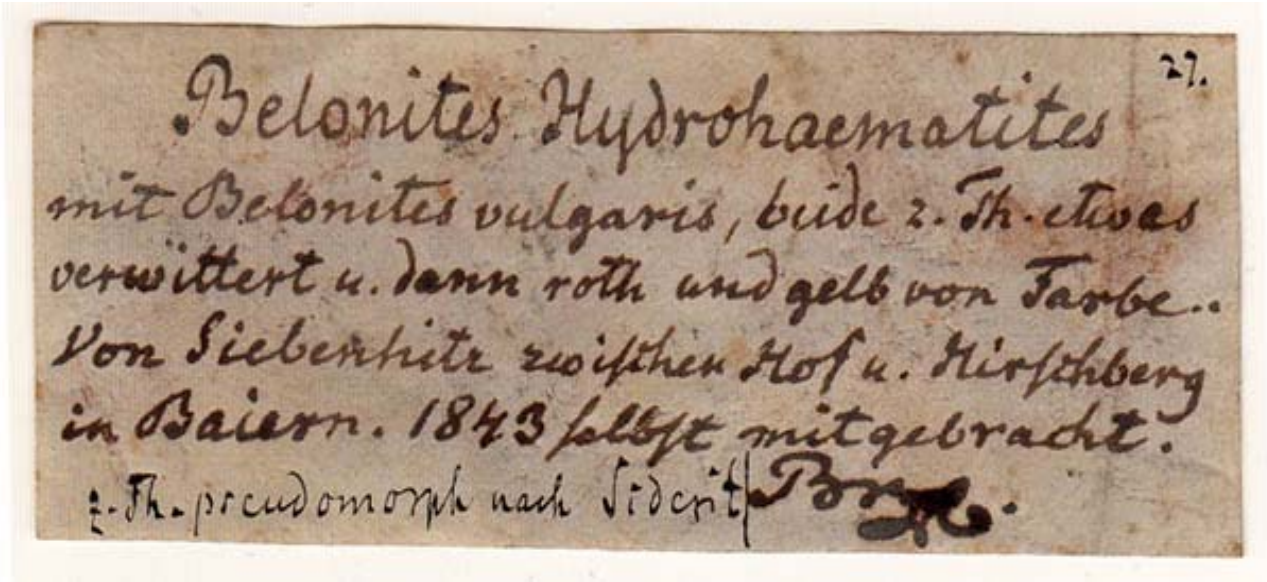


Fig. 2 – Label accompanying “Hydrohaematites” from Siebenhitz between Hof and Hirschberg in Bavaria. (Courtesy Andreas Massanek)

Field Camp, SUNY at Selkirk 1982:
Reflections of a Geologist on the Merits of Field Camp

Bill Stephens, PG, Stephens Environmental

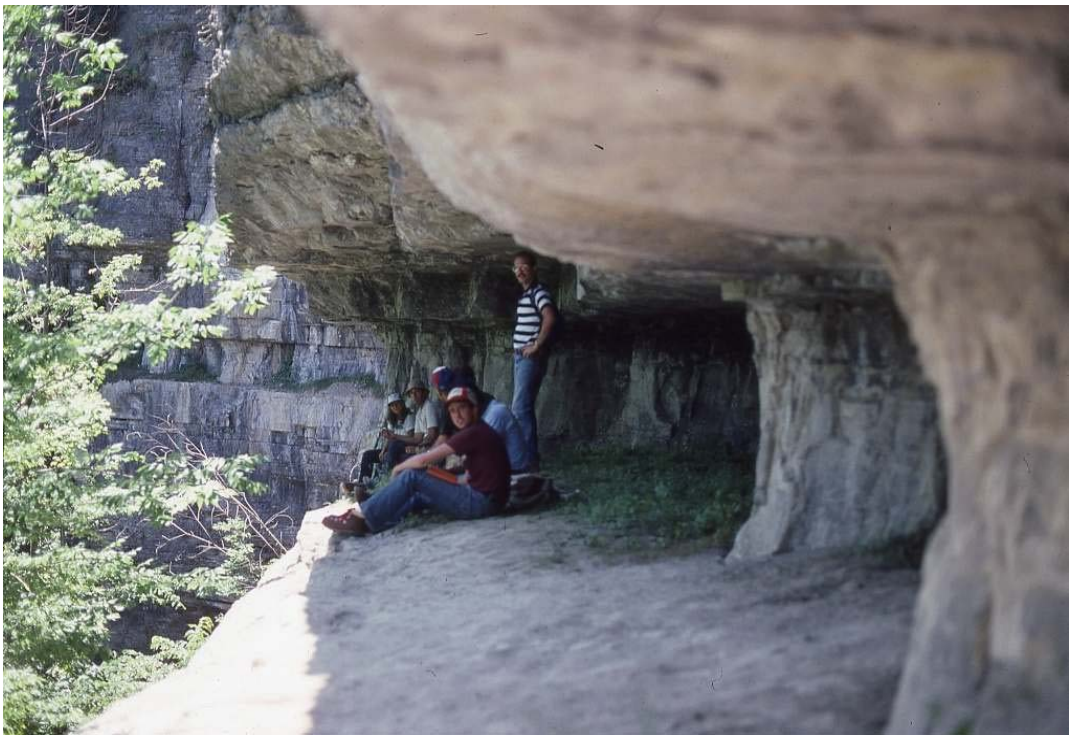
One of the fundamental requirements for a Bachelor of Science in Geology in my day was field camp. Field Camp was offered by many schools, as a separate and commonly expensive minimum 5 to 7-week full time in the field experience. The University of Pittsburgh where I went to school did not offer a field camp at the time, and I along with two of my college mates, Steve Burtell and Steve Redgate elected to attend the field camp at the State University of New York (SUNY) at Selkirk, mainly because it was close, cheap and accredited for graduation at Pitt. We had no idea what exactly we were in for, but we knew it was required. Unfortunately for me, I could not afford to go to Princeton's field camp in the Beartooth Mountains, as it was $3,000, even though my future thesis advisor taught there and recommended it. All I knew was we could leave early and check out the Herkimer Diamond Mine, me being a collector and all.

Our first stop on the way out was Herkimer and we camped at the campground across the street. The best crystals I ever found there I found on this trip within an hour or so of arrival. When we arrived at Camp Selkirk, we were assigned cabin tent bunks and the adventure began. Our missions included mapping the septic field with plane table and alidade, mapping exposures of Helderberg Group carbonate rocks along a railroad cut, measuring the section at Indian Ladder, and a jaunt through the Adirondacks looking at deep ancient hard rocks and young unconsolidated glacial deposits side by side, all while learning to work and cooperate in assigned teams with people you don't know, some serious and some not so serious about geology, and to live in the field for weeks at a time.

In the modern age, direct contact time of budding geologists with the rocks has been declining due to field camp closures around the country. They became so expensive. And now, in the age of COVID 19, classroom contact time has been cut dramatically such that students rarely have contact with specimens and lab equipment. The result is graduates are less enthusiastic and significantly less prepared for their career. As you might guess, I'm a staunch advocate for field camp as a requirement for a BS in Geology, so come along with me on a personal journey back in time to those days when geology students actually had the experience of real field geology. Many of these locales are places you can still visit today though some exposures may be covered with vegetation or destroyed by collectors.

Biography

Bill Stephens is a licensed professional geologist and owner of Stephens Environmental Consulting, Inc. Mr. Stephens holds a Bachelor of Science and a Master of Science, both in Geology, from the University of Pittsburgh. Mr. Stephens has owned and operated a private environmental consulting and civil design firm for over 20 years. Mr. Stephens has been collecting since the age of 12, and is a member of the FoM-PA Chapter Board of Directors.



Indian Ladder, New York. Devonian Helderberg Group

Migmatite with melanocratic xenolith, Adirondacks