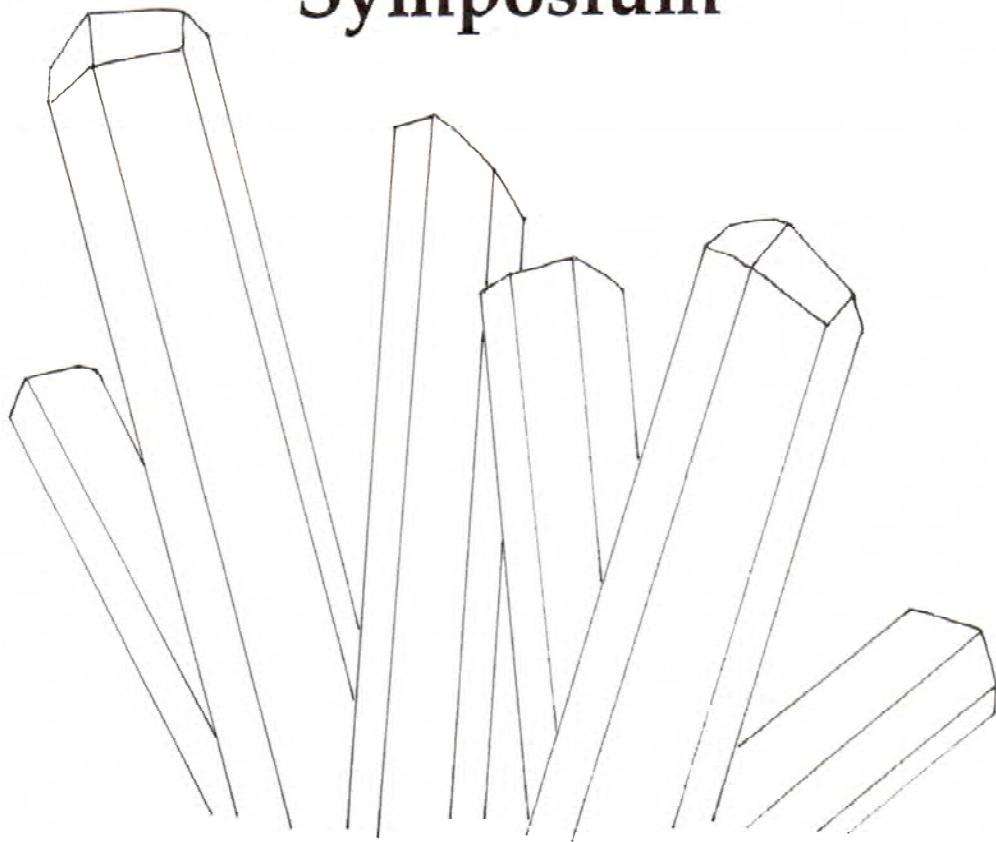


**The 43<sup>rd</sup>  
Rochester Mineralogical  
Symposium**



**April 14-17, 2016**

# 43rd Rochester Mineralogical Symposium

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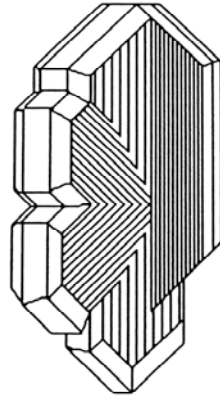
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Our warmest welcome to the 43<sup>rd</sup> Rochester Mineralogical Symposium. We continue this year with our program designed to provide excellent speakers, new information, camaraderie, displays of extraordinary specimens, opportunities to acquire desired objects—all in a familiar and comfortable environment. Our speakers for this year include several who have never lectured here before and others who are familiar faces. Most of their topics will be quite new to our collective experience. This year's Technical Session is again robust! We welcome numerous new attendees and hope you enjoy our meeting. We appreciate the continuing support of returning attendees. The Program Notes are again electronically printed with a mix of color and black and white. As usual, everything is different, yet everything is the same.



Sphalerite and Calcite from the 650-foot level of the Hyatt mine, Talcville, NY. This 8-cm specimen was collected by David Bowman in October 1994.

# PROGRAM

Thursday Evening, April 14, 2016

PM 4:00-6:00 Cocktails and Snacks – Hospitality Suite, Room 400 (4<sup>th</sup> Floor)

6:00-7:45 Dinner – Baxter’s

8:00-9:15 **Collecting Minerals on Southern Baffin Island, Canada: An Arctic Adventure** – *Brad Wilson*

Brad’s interest in minerals began at a young age, but fully crystallized (pardon the pun) in 1978 when he accidentally discovered transparent smoky quartz in northern Canada. Since then, his keen interest in Canadian minerals and gemstones has led Brad all across Canada prospecting for minerals and gemstone rough. Brad completed B.Sc. and M.Sc. degrees in geology at Queen’s and Carleton Universities, and in 1991, he became a Fellow of the Canadian Gemmological Association (CGA). A faceter of gemstones since 1979, Brad cuts many rare and soft collector stones as well as the more traditional colored gemstones.

Brad is the Canadian partner of “Coast to Coast Rare Stones International”, a company specializing in rare, soft and collector gemstones, and he operates “Alpine Gems”, a gem-cutting shop and consulting business in Kingston, Ontario. In addition to selling gemstones, Brad works as a gemstone exploration consultant, offering property evaluation and exploration services specifically for gemstones. He has also written several articles on Canadian gemstones.

Tonight, Brad will share his fearless love of nature as he collected minerals on southern Baffin Island. We warmly welcome Brad Wilson on his return to the speakers’ podium.

9:15 Cocktails and snacks in the Hospitality Suite on the 4<sup>th</sup> floor will be available throughout the rest of the evening. Dealers’ rooms will be open at this time. All of the dealers are located on the 4<sup>th</sup> floor.

Friday Morning, April 15, 2016

AM 9:00 Announcements

9:15-10:15 **The Societal Importance of Uranium Minerals and Mineral-Inspired Materials** – *Dr. Peter Burns*

Dr. Peter C. Burns is the director of the Center for Sustainable Energy at the University of Notre Dame and also the director of an energy frontier research center, Materials Science of Actinides. He is the Henry Massman professor of Civil and Environmental Engineering & Earth Sciences and concurrently professor of Chemistry & Biochemistry. Peter earned a B.Sc. in geology from the University of New Brunswick, an M.Sc. in geology from the University of Western Ontario, and a Ph.D. from the University of Manitoba. Among many leadership positions he has held in service to mineralogy, Peter is currently president of the IMA through 2018. His many honors include the Peacock Medal of the Mineralogical Association of Canada (2016), the MSA award and Life Fellow of the Mineralogical Society of America (2001), and the Donath Medal of the Geological Society of America (1999). The mineral burnsite was named in his honor in 2003. His more than 370 published papers mostly concern the mineralogy of uranium, the structure of uranium compounds, and potential applications of these structures.

This morning, Peter will survey how detailed knowledge about the very diverse chemistry and structure of uranium compounds yields useful applications that benefit society. We warmly welcome Dr. Peter Burns to his debut at the speakers’ podium.

10:15 Coffee Break

10:30-11:30 **Mineralogy of Uranium and Thorium - Dr. Robert Lauf**  
Dr. Robert J. Lauf earned a Ph.D. in metallurgical engineering from the University of Illinois. For more than twenty years he served as a scientist at the Oak Ridge National Laboratory. He is now a registered patent agent and technology consultant. He is also a prolific author of books on specimen mineralogy. He has published more than a dozen well-received books in Schiffer Book's "Collector's Guide" series and serves as the external editor for Schiffer's earth science series.

It is especially appropriate that Bob Lauf joins us this year as a speaker to mark the publication of his impressive new book, *Introduction to Radioactive Minerals*. We warmly Dr. Robert Lauf to the speakers' podium.

11:30-1:00 Lunch and Shopping Break

### Friday Afternoon, April 15, 2016

- PM 1:30 **Contributed Papers in Specimen Mineralogy - Dr. Carl A. Francis - Moderator**
- 1:30 A tectonic evaluation of pegmatite parent granite by **S. L. Hanson**.
- 1:45 A new spodumene-bearing pegmatite occurrence in Appleton, Knox County, Maine by **M. M. Felch**, D. P. West, and A. U. Falster.
- 2:00 Interaction of basaltic lava with gem tourmaline miarolitic cavities in the Havey pegmatite, Poland, Androscoggin County, Maine by **A. U. Falster** and W. B. Simmons.
- 2:15 The occurrence of unexpected elements in the Stettin Complex, Wausau Syenite Complex, Marathon County, Wisconsin by **T. W. Buchholz**, A. U. Falster and W. B. Simmons.
- 2:30 Continued mineral investigation of the natrolite syenite dike, Stoutameyer Creek Area, Augusta County, Virginia by **L. K. Fike**, L. E. Kearns, R. Rothenberg, T. Tucker, R. Tibbet, D. Smoley, R. Rowe, and T. Steede.
- 2:45 Shale fire minerals from the Huron River burn site near Milan, Ohio: "Final" Report by **R. P. Richards**, A. R. Kampf, B. Nash, J. B. Murowchick, and J. Rakovan.
- 3:00 Gem-quality anorthoclase megacrysts in alkali basalts of the Ratanakiri Volcanic Province, Cambodia by **P. C. Pilonen**, G. Poirier, and R. Rowe.
- 3:15 Fifteen-minute coffee break
- 3:30 Loans to museums: A museum's perspective by **B. A. Geller**.
- 3:45 World's finest rock crystal: Muzo habit quartz from Peñas Blancas, Boyaca, Colombia by **C. A. Francis**, K. Downey, J. Fast, P. Heckscher, and G. Turner.
- 4:00 Reichenstein-Greiserntal quartz twinning: Two sides of the same law by **B. Morgan**.
- 4:15 Fluorine-dominant minerals in the Franklin Marble, Franklin Mining District, New Jersey, USA by **V. King**.
- 4:30 End of Technical Session
- 4:30-6:30 Extended Shopping Break

## Friday Evening, April 15, 2016

6:30-8:00 Dinner – Baxter’s

8:15-9:15 **Crystalline Showcases – John Koivula**

John I. Koivula joined the GIA in 1976. He has spent more than fifty years studying and photographing the microworld of gemstones and has published more than 800 articles and notes on the inclusions in gemstones and related topics. John is a contributor to several books, including the American Geological Institute’s *Glossary of Geology*, Robert Webster’s *Gems, Geologica*, a book on crustal landforms, and the GIA’s *Diamond Dictionary*. John is co-author with Dr. E. Gübelin of the *Photoatlas of Inclusions in Gemstones, Volumes 1, 2, and 3*, and the author of *The MicroWorld of Diamonds*. John holds university degrees in both geology and chemistry and the gemological credentials: G.G., C. G., and F. G. A. He was awarded fellowship in the Royal Microscopical Society and also serves on the executive board of the International Gemmological Conference group (IGC). He is an honorary life member of the Finnish Gemmological Society and the Gemmological Association of Great Britain. His many awards include the GIA’s Richard T. Liddicoat Award for Distinguished Achievement, the American Gem Society’s Robert M. Shipley and Richard T. Liddicoat award, and the Scholarship Foundation Award from the American Federation of Mineralogical Societies, among others. He also received the Antonia C. Bonanno Award for excellence in gemology from the International Accredited Gemologists Association. John previously worked for Cominco American as an exploration field geologist. He is currently the analytical microscopist at the Gemological Institute of America, headquartered in Carlsbad, CA.

John has shared his vast knowledge and many images of scientific art at the RMS in the past, and we most warmly welcome him back to our speakers’ podium.

9:15-??? Continuation of “Shop’til You Drop”, spirits, and fellowship – 4th Floor

## Saturday Morning, April 16, 2016

- AM 9:00-10:00 **What’s New in Minerals and Localities, Part I – Jeffrey A. Scovil**  
Each year Jeff Scovil shares his excellent photographs of minerals that have appeared on the market since the previous Symposium. Again this year, we welcome Jeff to the speakers’ podium for What’s New in Minerals and Localities.
- 10:00-11:00 **What’s New in Minerals and Localities, Part II – Contributions from the audience.**
- 11:00-1:30 Lunch and Shopping Break

## Saturday Afternoon, April 16, 2016

- PM 1:30-2:30 **Minerals and Mineralogists of France – Dr. Robert Martin**  
Dr. Robert F. Martin is professor emeritus in the Department of Earth and Planetary Sciences at McGill University. A native of Ottawa, Canada, he earned a B.Sc. from the University of Ottawa, an M.S. from Penn State, and a Ph.D. from Stanford, all in geology. His doctoral advisors were O. Frank Tuttle of Tuttle and Bowen fame and Richard H. Jahns, “Mr. Pegmatite”. Early on, Bob specialized in the mineralogy and petrology of granitic rocks and related pegmatites. In 1970, he joined the staff of McGill University in Montreal. He has focused his research on anaerogenic felsic magmatism and on the interplay of tectonic setting and petrogenetic processes. In

1978, Bob Martin was invited to become editor of *The Canadian Mineralogist*—a post he held until 2012—a heroic (or masochistic?) 35-year stint. He recently published an Atlas of Ore Minerals, with a focus on epithermal deposits of Argentina (*The Canadian Mineralogist, Special Publication II*). He is currently hard at work on *Special Publication 13* on the minerals and mineralogists of France.

This afternoon Dr. Martin will give us some snippets from his ongoing project. We warmly welcome him to the RMS speakers' podium.

2:30 Coffee Break

2:45-3:45 **From Gemology to Mineral Physics and Back Again - Elise Skalwold**

Elise A. Skalwold is Consulting Gemological Curator in the Department of Earth & Atmospheric Sciences at Cornell University. She holds a B.Sc. from Cornell University and is a graduate gemologist (G.G.) having trained at the Robert Mouawad Campus of the GIA. While living in Thailand, she worked in the famous gem markets of both Chanthaburi and Bangkok and pursued studies at the Gem and Jewelry Institute of Thailand. Subsequently she was elected a Fellow of the Gemmological Association of Great Britain (F.G.A). Elise is an active member of the Society of Mineral Museum Professionals. See her notes in this volume for more detailed information!

This afternoon, Elise will speak from the boundary between gemology and mineral physics. We warmly welcome Elise Skalwold back to the speakers' podium.

### Saturday Evening, April 16, 2016

5:15-6:30 SILENT AUCTION

7:00-8:30 Fortieth Annual Symposium Auction Dinner – Main Ballroom

8:30 FORTIETH ANNUAL SYMPOSIUM AUCTION

### Sunday Morning, April 17, 2016

AM 9:00-10:00 **Minerals of the Belvidere Mountain Asbestos Quarries, Lowell-Eden Vermont – Ken Carlsen and Dr. Woodrow Thompson**

Ken Carlsen taught earth science in Bennington, Vermont until his retirement. He has written articles for *Rocks & Minerals*, including the most recent on this morning's topic. He also co-authored the chapter on Eden Mills in *American Mineral Treasures*. Dr. Woodrow Thompson is a native of Plymouth, New Hampshire and holds a bachelor's degree from Dartmouth College and a Ph.D. from Ohio State. Woody spent much of his career working for the Maine Geological Survey along with stints with the U.S. Geological Survey and a season in Antarctica. Since retirement he has been working on the glacial geology of the White Mountains. He was a driving force behind the original Maine Mineral Symposium. He is also an enthusiastic collector of English minerals.

This morning these two experts on New England minerals will share their passion for the history and minerals of Belvidere Mountain, Vermont. We warmly welcome them to the speakers' podium.

10:00-11:00 **The William W. Pinch Collection at the Canadian Museum of Nature – Michael Bainbridge**

Michael J. Bainbridge worked as a Cameraman and Director of Photography in film and television for ten years before switching to shooting things that don't move. He now specializes in photographing mineral specimens for museums and private collectors. Also a passionate advocate for the hobby, Michael is a frequent guest speaker and lecturer on all topics geological and photographic, in venues from Westward Look and the Tucson Main Show to the local college and his young daughter's school class.

In 2006, Michael began regularly visiting the Haliburton Highlands (covering the



western extent of the Canadian Grenville Geologic Province) from his home in Ottawa. In 2009, he settled full-time in Minden, one hour west of “Canada’s Mineral Capital”, Bancroft, Ontario. Since then he has also been working to help re-popularize hobby mineral collecting and general interest in geology through public outreach and tourism activities.

Most recently, he has been working with the Canadian Museum of Nature to illustrate the William W. Pinch Collection. He is also an author on an upcoming book on Grenville Minerals with Drs. George Robinson, Jeff Chiarenzelli, and Scott Ercit. Today he is going to give us a guided tour of the William W. Pinch Collection at the Canadian Museum of Nature, illustrated with his own outstanding photographs. We warmly welcome him back to the speakers’ podium.

11:00 End of the Symposium

See you next year for the  
44<sup>th</sup> RMS:  
**April 20-23, 2017**

## Contributed Papers in Specimen Mineralogy

This year submitted abstracts were reviewed by a committee consisting of Dr. Carl Francis, Dr. Marian Lupulescu, Dr. George Robinson, Dr. Sarah Hanson, and Dr. Steve Chamberlain. Eleven abstracts were submitted, accepted and scheduled for platform presentations on Friday afternoon. The accepted abstracts follow.

### **THE OCCURRENCE OF UNEXPECTED ELEMENTS IN THE STETTIN COMPLEX, WAUSAU SYENITE COMPLEX, MARATHON COUNTY, WISCONSIN.**

Buchholz, T. W.<sup>1</sup>, Falster, A. U.<sup>2</sup>, and Simmons<sup>2</sup>, W. B. <sup>1</sup>1140 12th Street North, Wisconsin Rapids, Wisconsin 54494; <sup>2</sup>Maine Mineral and Gem Museum, PO Box 500, 99 Main Street, Bethel, Maine 04217.

The Stettin Complex is the oldest (1565 Ma) and most alkalic of the four intrusions comprising the Wausau Syenite Complex (WSC), and is composed of several intrusive phases including pyroxene syenite, nepheline syenite, tabular syenite, amphibole syenite and syenite aplite. Over the last several decades we have amassed considerable data on the behavior of some minor elements during the formation of this complex, notably Li and Sn, which are addressed here.

Li mineralization in alkalic complexes is not particularly uncommon, but may be easily overlooked, particularly when Li occurs in minerals that are not normally considered to be Li bearing. Historically in the Stettin complex, a lithian mica, later determined to be zinnwaldite, was described by Weidman (1907) from a pegmatite located in the SW  $\frac{1}{4}$  NW  $\frac{1}{4}$  S. 22 T 29N R6E. More recently, we have identified: sparse zinnwaldite in a small pegmatite outcropping along Woodland Drive; tainiolite in the Ravine Pegmatite on the west side of the old Dehnel Quarry (confirmed via EMP (electron microprobe), XRD (X-ray diffraction) and DCPS (direct coupled plasma spectroscopy)); tainiolite in a syenite pegmatite from a farmer's rock pile on the north side of Evergreen Drive (EMP and DCPS); and probable tainiolite in material from the old Summit prospect, a failed attempt to mine U from a Th-rich pegmatite (DCPS). However, much of the Li in rocks of the Stettin Complex is contained in minerals generally not considered to contain Li. Analyses of biotites from the complex (largely annite) reveal Li<sub>2</sub>O contents of up to 1.8 wt. %, and aegirine from the Summit prospect and the Dehnel quarry consistently contains about 0.9 wt. % Li<sub>2</sub>O. Arfvedsonite, common in syenite pegmatites of the complex, commonly contains about 1.9 wt. % Li<sub>2</sub>O, and riebeckite from the Ravine Dike, Dehnel quarry contains 1.2 wt. % Li<sub>2</sub>O. Finally, analyses of pond water within the outcrop area of the complex reveal significant levels of dissolved Li (up to 60 ppm), likely leached from Li-bearing minerals in surrounding soils and rocks.

Sn mineralization appears to be very scarce in alkalic complexes worldwide, with only a few reports of Sn minerals in the literature. Reports of cassiterite are particularly sparse; to our knowledge these are limited to the Khibiny Massif and Lovozero pluton, Kola Peninsula, Russia, and Mount Malosa, Zomba District, Malawi (Mindat, accessed 12/2015). In the Stettin complex, small grains of cassiterite and ilmenite were found in heavy mineral separates from the pegmatite outcropping on Woodland Drive. Additionally, heavy mineral separates from a mass of arfvedsonite-K-feldspar pegmatite from the site on the north side of Evergreen Drive revealed 4 small grains of cassiterite embedded in Fe-oxides, likely derived from alteration of siderite.

Since all Stettin Complex aegirines and arfvedsonites examined contained significant concentrations of Li, and considering the abundance of these minerals in the pegmatites, it seems likely that the Li budget in the WSC is probably higher than one might expect, an idea supported by the concentrations of Li in nearby pond water. The presence of discrete Sn mineralization also suggests unusual

fractionation trends that result in elevated Sn concentrations in the WSC. This is further supported by elevated Ta contents in WSC columbite- and pyrochlore-group minerals, particularly in the Woodland Drive pegmatite, where Ta contents of pyrochlores approach though do not achieve Ta dominance, and elevated Mn, reflected by the presence of columbite-(Mn) and cryptomelane, uncommon in alkalic intrusions.

#### REFERENCE

Weidman, Samuel (1907) The Geology of North Central Wisconsin, Wisconsin Geological and Natural History Survey, Madison, WI.

#### **INTERACTION OF BASALTIC LAVA WITH GEM TOURMALINE MIAROLITIC CAVITIES IN THE HAVEY PEGMATITE, POLAND, ANDROSCOGGIN COUNTY, MAINE.**

Falster, A. U. and Simmons, W. B. Maine Mineral and Gem Museum, PO Box 500, 99 Main Street, Bethel, Maine 04217.

The Havey pegmatite is a gem tourmaline producing pegmatite in Poland, Androscoggin County, Maine. The pegmatite is part of the Oxford pegmatite field in the Sebago Migmatite Terraine. The pegmatite is intruded into a country rock composed of amphibolite and calc silicate rocks. The pegmatite is highly evolved and carries pollucite as one of the most fractionated minerals. Tourmaline occurs essentially in all zones of the pegmatite. Gem tourmaline of fluor-elbaite and darryllhenryite compositions with remarkable color (green dominantly with lesser pink and blue colors) consistently occurs in the miarolitic cavities of the core margin of the pegmatite. Fluor-schorl and schorl are common in the wall zone of the pegmatite. Several Mesozoic alkali diabase dikes have cross-cut the Havey pegmatite. In a few instances, gem pockets with green and pink tourmaline were intersected by these younger dike rocks. The estimated time for the dike rocks to completely solidify was likely no more than a few hours. This short time was enough, however, to drastically affect some of the minerals in the miarolitic cavity: tourmalines were severely shattered and also altered at the contact with melt. Plagioclase grains exhibit effects of mechanical stress (twinning, bending of crystals) and mica species show odd development of domain textures that are not present in miarolitic cavities not affected by dike rock interaction. Montebasite shows only little interaction and quartz was essentially unaffected, not surprising, since its thermal expansion coefficient is near zero. The presence of odd quartz crystals in a nearby miarolitic cavity may be related to the effects of the dike rocks. These quartz crystals have a very dark outer zone and the crystal faces are oddly rounded, possibly some etching and recrystallization phenomenon. The lesson to heed in the case of dike rock interaction and gem tourmaline pockets is that it is NOT beneficial for gem stock!

#### **A NEW SPODUMENE-BEARING PEGMATITE OCCURRENCE IN APPLETON, KNOX COUNTY, MAINE.**

Felch, M. M.<sup>1</sup>, West, D. P.<sup>2</sup>, Falster, A. U.<sup>1</sup>. <sup>1</sup>Maine Mineral and Gem Museum, PO Box 500, 99 Main Street, Bethel, ME 04217; <sup>2</sup>Department of Geology, Middlebury College, Middlebury, VT 05753.

Spodumene, a lithium aluminosilicate, rarely occurs in coastal Maine pegmatites. Only three localities have been reported: The Starrett quarries in Warren (Hess *et al.* 1943), the Peg Claims in Cushing, ME (Sundelius 1963), and the Georgetown pegmatite in Georgetown, ME (King and Foord 1994). Interestingly, the Georgetown locality is the only Maine pegmatite that has produced gem quality spodumene from miarolitic cavities. Here we report the preliminary findings of recently discovered spodumene-bearing pegmatites in Appleton, Knox Co., Maine.

The small pegmatite bodies (< 100 m<sup>2</sup>) are discordant, intruding into steeply dipping lower amphibolite facies rocks of the Jam Brook Complex. Mineralogically, the pegmatites are composed of

quartz, alkali feldspar, cleavelandite, white mica, and euhedral spodumene crystals that reach up to a meter in length. Accessory minerals include columbite ( $\leq 2$  cm), zircon ( $< 1$  mm), transparent green tourmaline (1-4 cm) and rare montebasite nodules up to 6 cm across. Some pegmatite bodies contain aplite units composed of quartz and alkali feldspar.

One of the well exposed dikes shows evidence of compositional and textural zonation. Along the hanging wall contact is a narrow 1-2 cm wall zone composed primarily of coarse-grained feldspar, quartz and occasional spodumene laths. The wall zone grades into a very coarse-grained bimodal core zone (up to 2m) rich in spodumene and quartz. Near the wall zone-core boundary, spodumene pseudomorphs ( $< 6$  cm) oriented perpendicular to the contact have been replaced by white mica and quartz. Large spodumene crystals oriented perpendicular to the contact taper into the core zone.

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- Hess, F.L., Whitney, R.J., Trefethen, J., Slavin, M. (1943) The Rare Alkalis in New England: U.S. Bureau of Mines, Information Circular No. 70232, 51p.
- King, V.T., Foord, E.E. (1994) The Mineralogy of Maine Volume 1: Descriptive Mineralogy. Maine Geological Survey, Augusta, Maine, USA, 418p.
- Sundelius, H.W. (1963) The Peg Claims Spodumene Pegmatites, Maine. *Economic Geology* **58**(1), 84-106.

### **CONTINUED MINERAL INVESTIGATION OF THE NATROLITE SYENITE DIKE, STOUTAMEYER CREEK AREA, AUGUSTA COUNTY, VIRGINIA.**

Fike, L. K.<sup>1</sup>, Kearns, L. E.<sup>1</sup>, Rothenberg, R.<sup>2</sup>, Tucker, T.<sup>3</sup>, Tibbet, R.<sup>4</sup>, Smoley, D.<sup>5</sup>, Rowe, R.<sup>6</sup>, Steede, R.<sup>7</sup> <sup>1</sup>Dept. of Geology & Envir. Science, James Madison University, Harrisonburg, VA 22807; <sup>2</sup>9 Watkins Ave., Oneonta, NY 13820; <sup>3</sup>131 Todd Rd., Mount Sidney, VA 24467; <sup>4</sup>218 Fairhaven, Hudson JOP 1H0, Quebec, Canada; <sup>5</sup>519 Sequoia Drive, Pittsburgh, PA 15236; <sup>6</sup>Canadian Museum of Nature, 1740 Pink Road, Gatineau, Quebec, Canada; <sup>7</sup>Rykert Crescent, Toronto, Ontario, M4G 2S9 Canada.

Augusta County, Virginia is host to 41 mapped syenite dikes, trending along a northwest to southeast line. The dikes are late Jurassic to early Cretaceous (around 145 to 135 my) in age, and intrude deformed, middle Paleozoic, sedimentary rocks. One dike is located along Stoutameyer Creek where it is exposed as large colluvial boulders of natrolite syenite. Within the syenite, 1 to 2 centimeter miarolitic cavities contain minerals that have unusual chemical compositions. These minerals formed from a sodium-saturated solution enriched in incompatible elements that were concentrated and crystallized rare minerals in the late-forming cavities. Minerals of the Stoutameyer Creek dike are chemically similar to the assemblages found in the syenites of Mont Saint-Hilarie, and Demix-Varenes Quarry, Quebec, Canada as well as the Kola Peninsula, Russia. Komkovite [BaZrSi<sub>3</sub>O<sub>9</sub>•3H<sub>2</sub>O], Catapleiite [Na<sub>2</sub>ZrSi<sub>3</sub>O<sub>9</sub>•2H<sub>2</sub>O], Nenadkevichite [Na<sub>3</sub>(Nb,Ti)<sub>2</sub>(Si<sub>4</sub>O<sub>12</sub>)(O,OH)<sub>2</sub>•4H<sub>2</sub>O] and other species found in the Stoutameyer Creek dike are the focus of this study. Additional and numerous unidentified silicate minerals, composed of elements such as Zr, Ba, Ti, Nb, and F, might yield new or previously unreported mineral species.

### **WORLD'S FINEST ROCK CRYSTAL: MUZO HABIT QUARTZ FROM PEÑAS BLANCAS, BOYACA, COLOMBIA.**

Francis, C. A.<sup>1</sup>, Downey, K.<sup>2</sup>, Fast, J.<sup>3</sup>, Heckscher, P.<sup>4</sup>, Turner, G.<sup>5</sup> <sup>1</sup>Maine Mineral & Gem Museum, Box 500, Bethel, ME 04217; <sup>2</sup>Well-Arranged Molecules, 221 Pine St., Suite 254, Florence, MA 01062; <sup>3</sup>MineralMovies.com, P.O. Box 541, East Hampton, CT 06423; <sup>4</sup>The Crystal Circle, 7990 Red

Fox Trail, Morrow, OH 45152; <sup>5</sup>Cornerstone Minerals, 52 North Lexington Ave., Asheville, NC 28801.

Colorless quartz crystals from Colombia that are perfectly transparent and have a particularly bright luster have been on the market for some years. Their source is Peñas Blancas, which is Colombia's most remote emerald mine. It lies in the western belt of emerald deposits 130 km north of Bogota and 25 km north of Muzo. The nearest town is Borbur, formally Municipio de San Pablo de Borbur. The history and geology of Peñas Blancas were recently described by Ringsrud and Boehm (2013). The deposit consists of veins to 30 cm wide cutting the Rosablanca formation, a compact and blocky shale. Emerald crystals nucleated on the walls and extend into the veins which are filled with calcite, dolomite, pyrite and quartz. Significantly, Ringsrud and Boehm (2013 p. 194) report that, "The abundance of quartz as a vein mineral differentiates Peñas Blancas from other emerald mines in the area."

Quartz specimens are almost exclusively single crystals commonly 2 to 8 cm long with aspect ratios of ranging from 2 to 4. Exceptional crystals reach 20 cm and weigh ~ 2 kg. One 18 kg crystal is reported! Peñas Blancas crystals have a distinctive appearance - the Muzo habit. Quartz crystals of normal habit are straight prisms. They are bounded by the hexagonal prism  $m\{10-10\}$  and capped by two sets of three rhombohedral faces:  $r\{10-11\}$  and  $z\{01-11\}$ . Muzo habit crystals are trigonal, not hexagonal in cross section. The six prism faces are divided into two sets of three and taper towards the termination. This is caused by growth on  $z$  being faster than on  $r$ . The  $z$  faces become smaller and the prism faces developing under them become narrower. We have even noted 5-sided crystals, formed when one  $z$  face and its accompanying  $m$  face pinch out completely.

Crystals of the Dauphine habit have their terminations completely dominated by a single rhombohedral face. Some Peñas Blancas crystals have this feature as well.

Rarer crystal forms, the trigonal pyramid  $s\{11-21\}$  and a trigonal trapezohedron (presumably  $x\{51-61\}$ ), are common permitting the handedness of many crystals to be distinguished. In one case Dauphine twinning was recognized by  $s$  faces on adjacent rather than alternate corners.

The combination of extraordinary transparency, exceptional luster, and interesting morphology make Peñas Blancas quartz crystals the finest examples of rock crystal in the world!

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#### **LOANS TO MUSEUMS: A MUSEUM'S PERSPECTIVE.**

Geller, B. A., Colorado School of Mines Geology Museum, 1310 Maple St., Golden, CO 80401.

People loan materials to museums for a myriad of reasons – some altruistic, some egotistical, some commercial. Frequently, loaned materials to museums have never "officially" been on public display. Some remain in safe deposit boxes for extended periods, only to surface when they change ownership. When any museum accepts loaned materials, detailed paperwork must commence to document the terms of the loan – what may or may not be permitted by the receiving institution, provisions for insurance, handling, etc. After the loan is received, further work might involve label making, sign making, and layout for display.

Our Museum strives to change 20% of our exhibits annually, to satisfy the 20% of our guests that statistically visit us more than once. This creates the need for loaned materials because all collections are finite, allowing private individuals an opportunity to publically display their own specimens.

Our Museum has received loans since before my employment in 2007. From 2007-2016, we have received well over 175 loans. Nearly all of our loans are accepted solely for public display purposes,

and since 2010, it is unusual for us to accept a loan for any other reason.

Over 1/6 of the people who have loaned (whom I'll refer to as loaners) us specimens, enjoy the exercise so much that they have repeated the process. Over 2/3 of the loans we have accepted were Colorado specimens, but we have also accepted a diverse mix of non-geologic loans – from art to coins to archaeological artifacts. That said, over 3/4 of the loans were minerals, over 1/8 were gems, and our least received loans have been mining artifacts, fluorescents, archaeological artifacts, coins, and a moon rock.

One very popular activity that generates many loans is our Colorado themed case, which offers local collectors a chance to loan Colorado specimens into a group display for a period of one year. Past themes have included Mt. Antero, topaz, rare earth minerals, barite, fluorite, minerals from the San Juan Mountains, pyrite, and gemstones. These displays require the most work by our staff in terms of paperwork, labelling, and layout.

Other one year displays are generally from loaners who fill an entire display case with their specimens. Themes for these displays run from self-collected materials to displays from famous Colorado mining districts, selected specimens from purchased collections, specific mineral themes or localities (some international), other museums, fluorescents, meteorites, etc. One year loan intervals comprise over 2/3 of all loan durations to our Museum, but these have ranged from days to indefinite loan terms.

Some loans have terminated with unexpected outcomes. For example, while a very small number of specimens have been removed by loaners prior to their loan expiration dates, (a practice which is strongly discouraged), others had their expirations extended indefinitely. Still others were eventually donated to our Museum, or rarely purchased by our Museum.

Those of you with enviable collections realize the awkwardness of having unfamiliar guests visit your home displays. Loaning specimens to museums alleviates these problems by allowing others the chance to fully appreciate your bounty, with zero intrusion into your personal lives. The goal of this talk is to inform and to inspire collectors to loan their specimens to museums.

## **A TECTONIC EVALUATION OF PEGMATITE PARENT GRANITE**

Hanson, S. L., Geology Dept. Adrian College, 110 S. Madison St. Adrian, MI 49221.

Pegmatites derived via fractional crystallization of a parental granite can be subdivided into families based on petrogenetic parameters (Cerny and Ercit 2005). These include pegmatites enriched in lithium, cesium, and tantalum (LCT pegmatites) and those enriched in niobium, yttrium + rare-earth-elements (REE), and fluorine (NYF pegmatites). A small number of pegmatites do not fall neatly into these families and include those that exhibit mineralogical and chemical characteristics of both groups (mixed LCT + NYF pegmatites) and those that lack one of the chemical components that are suggested by the acronyms. Cerny and Ercit (2005) suggest that no strong relationship exists between pegmatite families and the tectonic setting in which they formed whereas Martin and DeVito (2005) propose that LCT pegmatites form in compressional (orogenic) settings whereas NYF pegmatites develop in extensional (anorogenic) settings.

Direct measurement of the geochemical composition of pegmatites is hindered by the large grain size of pegmatite minerals and the internal zonation of these minerals within the pegmatite. In zoned pegmatites, outcrops and quarries may not expose all of the minerals present. For these reasons, the relationship between tectonic environment of origin and pegmatite family was evaluated using published parent granite compositions as a proxy for the initial pegmatite composition. Data were mined via an extensive literature search that provided geochemical data for granite parental to 16 LCT, 24 NYF, and 3 mixed LCT-NYF pegmatites. Potential sources of error include incorrectly assigned parental granite and poor resolution of older geochemical data.

Trace element compositions for parental granites were plotted on the tectonic discrimination diagrams from Pearce et al. (1984). Orogenic granites form in either subduction related volcanic arc (VAG) or continental collision (syn-COLG) settings whereas anorogenic granites form in extensional, within plate (WPG) regimes (Figure 1). Post-orogenic (post-COLG) granite, which lies within the oval in Figure 1a, can be compositionally identical to syn-COLG, VAG and WPG granite. The transitional nature of this tectonic setting results in magma that contains components of both orogenic and anorogenic granites (Pearce 1986). Thus, other data, such as age determinations, may be required to accurately assign granite to a post-orogenic origin.

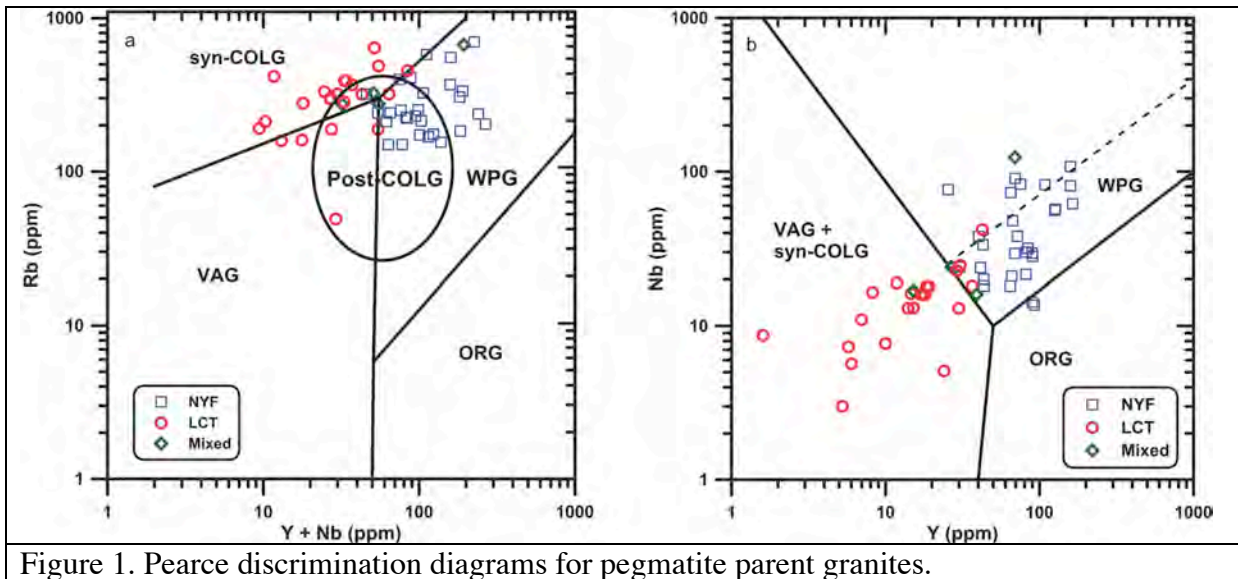


Figure 1. Pearce discrimination diagrams for pegmatite parent granites.

It is apparent from these diagrams that LCT granite-pegmatite systems originate in orogenic tectonic settings whereas NYF pegmatites form in post-orogenic to anorogenic settings. Geochemical differences in the granite from each tectonic setting are reflected in the pegmatite mineralogy. Granite formed in orogenic settings generally has higher abundances of LILE + B, thus the related LCT pegmatites typically contain Li-bearing and Cs-bearing minerals as well tourmaline group minerals. Anorogenic and post-orogenic granite is typically enriched in REE and HFSE ± F, thus the resulting NYF pegmatites typically have accessory Nb-Ta-Ti oxides, REE-bearing minerals, and in most cases fluorite. These petrogenetic differences hold for the quintessential LCT and NYF pegmatites as well as those that are deficient in one of the principle components.

Mixed signature pegmatites that can be attributed to parental granite are rare. For the locations included in this study, all plot within the post-orogenic to anorogenic field suggesting they may have been broadly NYF systems that were contaminated at the magmatic stage or hydrothermally altered by fluids enriched in components representative of LCT pegmatites.

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## **FLUORINE-DOMINANT MINERALS IN THE FRANKLIN MARBLE, FRANKLIN MINING DISTRICT, NEW JERSEY, USA**

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The Precambrian (~1.3 Ga) limestone precursor of the Franklin Marble was subjected to high-grade metamorphism (with peak metamorphic temperatures reaching 769°C) about 1.05 Ga (Volkert et al., 2005, Peck et al., 2006). The marble exposure is generally 2 km or less wide and extends about 34 km from Sparta northeastward to Amity, Orange County, New York. Kearns et al. (1980) reported fluorine-contents of a wide variety of species in Orange County and found: fluoro-edenite, fluoro-pargasite, fluorophlogopite, and fluor-tremolitic hornblende. Volkert et al. (2006) found fluoro-edenite in Franklin Marble just outside of the Franklin Mining District in Hardyston, NJ. Numerous chemical analyses of marble minerals in the Franklin Mining District show dominant fluorine. The first mention of a fluorine-bearing mineral in the Franklin Marble near Franklin, NJ was in Seybert (1819), where a mineral, now-known as norbergite, elicited a controversy (Nuttall, 1823a,b; Seybert, 1823a,b).

Franklin Marble is the host unit of the Franklin and Sterling Hill zinc-rich orebodies and those orebodies have a transitional alteration aureole attenuating to pure marble. Extensive contact interaction between the marble and the orebodies generated a zinc-manganese-rich silicate skarn. Contact metamorphic effects up to 10 meters from the skarn contact have yielded a rich suite of minerals, many of extraordinary quality. A rule of thumb to distinguish Franklin Marble matrix from ore-body alterations has been the red fluorescence of the calcite: red fluorescence associated with the Zn-Mn-bearing orebodies and no fluorescence in the Franklin Marble *sensu stricto*. The distinction is merely useful, not a certainty, especially as some calcite in contact with iron-ore-bearing units also fluoresces red (Earl Verbeek, personal communication, 2016). The Franklin Marble in Franklin-Ogdensburg is known to contain: amphibole group (actinolite, edenite, ferroactinolite, ferrohornblende, hastingsite, magnesio-hornblende, pargasite, richterite, tremolite), baumhauerite, brittle mica (margarite), feldspar group (albite, anorthite, and microcline), arsenopyrite, calcite, chlorite group (chamosite and clinocllore), epidote group (clinozoisite and epidote), corundum, dolomite, fluoborite, fluorapatite, fluorite, forsterite, galena, goldmanite, graphite, humite group (chondrodite, clinohumite, humite, and norbergite), molybdenite, monazite-(Ce), pararealgar, pyrite, pyroxene group (augite, diopside, and hedenbergite), pyrrotite, realgar, rutile, scapolite group (marialite and meionite), seligmannite, kaolin-serpentine group (antigorite), spinel group (hercynite, magnetite, and spinel), stibnite, talc, true mica group (fluorophlogopite, chromian muscovite, and paragonite), sussexite group (sussexite and szaibelyite), titanite, tourmaline group (dravite and fluoruvite), zinkenite, and zircon. Because the number of Franklin Marble fluorine-dominant species is increasing, further studies are being directed toward tourmalines and margarite, in particular.

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## **REICHENSTEIN - GREISERNTAL QUARTZ TWINNING: TWO SIDES OF THE SAME LAW**

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The Reichenstein-Greiserntal (R-G) law of quartz twinning has two twin angles, the Reichenstein of  $103^{\circ} 34'$  and the supplemental Greiserntal of  $76^{\circ} 26'$ , along with two differing crystal habits. (Fig.1) Greiserntal angled specimens display exaggerated notch growth, resulting in narrower prism faces in the inner notch with wider prism faces on either side. Reichenstein angled specimens have muted notch growth with widened prism faces in the inner notch. Why aren't they two different laws?

They might be considered two separate laws, but there is no satisfactory crystallographic way to describe the twin operation for Reichenstein angled twinning. It would require a mirror plane of symmetry that has no parallel to any quartz lattice plane, or a rotation around an axis perpendicular to that nonexistent plane.

As to differences in crystal habit, similar differences appear on Japan Law 'y' twins where both the acute  $84^{\circ} 33'$  Japan Law twin notch and its oblique supplement are present. The acute angled notch has exaggerated growth of meeting prism faces like that of acute Greiserntal angled twins. And in the wider oblique Japan Law notch, the 'growth shadow' of the smaller crystal in the larger crystal indicates muted growth of prism faces, along with rapid crystal widening until the smaller crystal becomes as wide as the larger crystal. This is similar to the muted growth of inner notch prism faces of the oblique Reichenstein angled twins and apparent widening toward the outside of the twin.

The original Greiserntal specimen was a smaller crystal that developed on a larger crystal and had both twin angles (Fig. 2). Having grown toward the base of the larger crystal, the smaller crystal on that end formed a Greiserntal angle. On its other end toward the larger crystal's termination is the Reichenstein angle between the c-axes of the two crystals. The extraordinarily large pyramidal face on the smaller crystal indicates downward spread from exaggerated Greiserntal angled growth and rapid Reichenstein spread to both sides.

Had this specimen continued to grow, the smaller crystal would have extended outward and downward. The larger crystal would have extended with prism faces growing beyond the smaller crystal. Then Goldschmidt's specimen would have displayed the Reichenstein angle more prominently than even the Greiserntal angle. Possibly the widening already displayed on the smaller crystal would have resulted in the Reichenstein angled wider crystal habit. That is what apparently happened twice on the surface of a larger crystal from the Black Hawk Mine in Montana, where two R-G 'y' crystals developed.

If Reichenstein angled specimens are outgrowths of the same Greiserntal crystal contact plane, the one parallel to the (101) face, then they are the supplemental side of what originated as a Greiserntal twin. But in most specimens only the supplementary twin angle is manifest, mostly due to available growth directions, and only appears to be a different kind of twin. That singular expression justifies its inclusion in the combined name.

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Fig. 1.

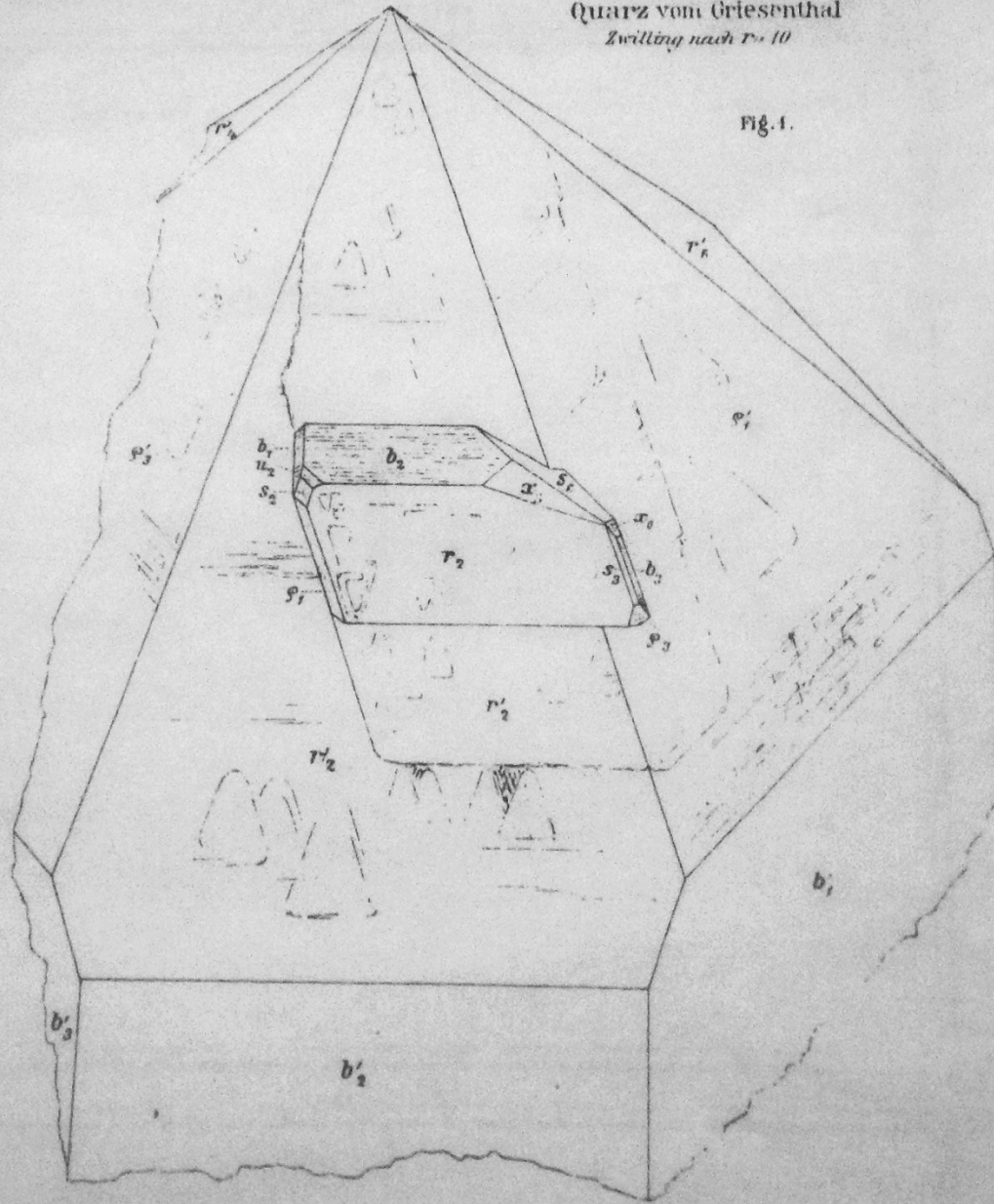


Fig. 2.

Fig. 1. Goldschmidt's Greiserntal specimen, larger crystal 9 cm by 5 cm.



Fig. 2. On left - Brazil Greiserntal angled twin 9.2 cm high. On right - Mt Tenneriff Reichenstein angled twin 4.cm across Rick Dillhoff collection and photo

### **GEM-QUALITY ANORTHOCLASE MEGACRYSTS IN ALKALI BASALTS OF THE RATANAKIRI VOLCANIC PROVINCE, CAMBODIA**

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High-temperature alkali feldspar megacrysts are known from a number of continental alkali basalt provinces worldwide including China, Australia, Antarctica, Scotland and the USA. They commonly occur as euhedral to subhedral single crystals or fragments exceeding 10 cm in size, often of gem quality, or in polymineralic xenoliths with other megacrystic minerals including clinopyroxene, Al-rich orthopyroxene, kaersutitic amphibole, titanomagnetite, ilmenite, biotite, apatite, Nb-Ta oxides, corundum and zircon. Although the feldspar megacrysts occur in alkali basalts, it is not chemically possible that they crystallized from this magma; they are thought to be xenocrysts, simply caught up in the basalt magma as it rose to the surface, and the result of high pressure crystallization in the sub-continental lithospheric mantle (~ 50-60 km depth) by a highly alkaline melt or fluid.

The Cenozoic (0.7 – 1.0 Ma) Ratanakiri Volcanic Province (RVP, 1500 km<sup>2</sup>) is located in the far northeastern corner of Cambodia. This region is known for its extensive deposits of gem-quality zircon which are mined in placer deposits in the laterite which covers much of the area. Oftentimes, zircon miners find other minerals in the zircon mine pits – tektites, magnetite and gem-quality feldspar crystals. Along with the zircons, the feldspar crystals have been weathered out of their host alkali basalts and concentrated in placer deposits at lower elevations.

Gem-quality alkali feldspars have been found *in situ* at ~10 localities across the RVP, occurring predominantly in massive and pyroclastic flows of alkali basalt, mugearite and tephrite associated with small cinder cones. Crystals are rounded and anhedral to blocky and subhedral, range in size from 0.5 to >10 cm, are transparent to translucent, and generally colourless to light yellow. Rare inclusions include dendritic spinel and Fe-oxides. Compositionally, the feldspar megacrysts are extremely homogenous, Na- and K-rich anorthoclase and sanidine (AN<sub>1-2</sub>AB<sub>53-79</sub>OR<sub>18-46</sub>). On the other hand, feldspars in the groundmass of the host alkali basalts are less evolved and more Ca-rich. This discrepancy between megacryst and groundmass feldspar compositions indicates that the feldspars crystallized from two chemically-distinct sources.



Fig. 1. Gem-quality anorthoclase from Borkeo, Ratanakiri province, Cambodia



Fig. 2. Gem-quality anorthoclase in alkali basalt, Borkeo, Ratanakiri province, Cambodia



Fig. 3. Gem-quality anorthoclase (9 cm) in mugarite from Sovann Kriri Vattana Ram Ting Jak monastery, Ratanakiri province, Cambodia.

### **SHALE FIRE MINERALS FROM THE HURON RIVER BURN SITE NEAR MILAN, OHIO: “FINAL” REPORT**

Richards, R. P., Kampf, A. R., Nash, B., Murowchick, J. B., and Rakovan J. Department of Geology, Oberlin College, Oberlin, OH 44074.

After more than five years, work on minerals formed in a shale fire in North-central Ohio is drawing to a close. This occurrence produced 24 mineral phases, 16 of them new to Ohio, 4 of them new to science, and 6 reported on Mindat from less than 5 locations elsewhere. Most are ammonium-bearing minerals, most are sulfates, and most are water soluble (Fig. 1). To date, most appear to be fairly stable when held in a stable, sealed environment (e.g. food storage boxes with gaskets and snap closure).

The new phases are:

**Sabieite-2H** and **Sabieite-3R**  $(\text{NH}_4)\text{Fe}(\text{SO}_4)_2$  (Kampf et al., 2014) are two sabieite polytypes that occur as intimately mixed phases in individual crystals which also exhibit fine-scale lamellar twinning. The crystals are tan, transparent hexagonal plates to 0.5mm (Fig. 2). The two polytypes are derived from the sabieite-1T structure by systematic stacking of two or three sabieite-1T (trigonal) layers in their mutual [001] directions.

**Carlsonite**  $(\text{NH}_4)_5\text{Fe}_3\text{O}(\text{SO}_4)_6 \cdot 7\text{H}_2\text{O}$  (Kampf et al., 2015a) occurs as rare orange-brown, mostly poorly-formed pseudo-hexagonal prisms associated with anhydrite, boussingaultite, gypsum and loncreekite (Fig. 3). It is triclinic:  $a = 9.572$ ,  $b = 9.737$ ,  $c = 18.382 \text{ \AA}$ ;  $\alpha = 93.11$ ,  $\beta = 95.33$ ,  $\gamma = 117.97^\circ$ . Carlsonite was named to honor the long work of Dr. Ernie Carlson, late of Kent State University, who was an expert on Ohio minerals and their occurrences, and was starting work on this locality at the time of his death.

**Huizingite-(Al)**  $(\text{NH}_4)_9(\text{Al,Fe})_3(\text{SO}_4)_8(\text{OH})_2 \cdot 4\text{H}_2\text{O}$  (Kampf et al., 2015b) occurs as druses of light yellow ridged crystals resembling prehnite, associated with anhydrite, boussingaultite, and salammoniac (Fig. 4). It is triclinic:  $a = 9.7093$ ,  $b = 10.4341$ ,  $c = 10.7027 \text{ \AA}$ ;  $\alpha = 77.231$ ,  $\beta = 74.860$ ,  $\gamma = 66.104^\circ$ . Huizingite-(Fe) was seen in most crystals studied as local zones with  $\text{Fe} > \text{Al}$ . However, there was no apparent pattern to the zones, and we did not find any crystals with  $\text{Fe} > \text{Al}$  on average, so we chose not to seek recognition of “Huizingite-(Fe)”. Huizingite-(Al) is named for Marie and Terry Huizing, in recognition of their sustained and important activities in support of mineralogy and mineral collecting.

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Species	NH4	Na	K	Ca	Mg	Al	Fe	SO4	Cl	O	OH	H2O	Rarity*			
													All	OH	NLoc	
Adranosite-(Al)														√	2	
Adranosite-(Fe)														√	2	
Alunogen																
Ammoniomagnesiovoltaite														√	1	
Anhydrite																
Boussingaultite														√		
Carlsonite														TL	√	0
Clairite														√	3	
Gypsum																
Halotrichite																
Huizingite														TL	√	0
Jarosite														√		
Kremersite														√		
Lonecreekite														√	4	
Mascagnite														√		
Metavoltine														√		
Pickeringite																
Pyracmonite														√	2	
Sabieite-2H														TL	√	0
Sabieite-3R														TL	√	0
Salammoniac														√		
Sulfur																
Tschermigite														√		
Voltaite														√		

Figure 1. Matrix of chemical composition and occurrence of the minerals from the shale fire. Under rarity: "All" shows phases for which this site is the type locality a check mark under "OH" means this is the first report from Ohio, and "NLoc" records the number of other non-anthropogenic sites listed in Mindat.



Figure 2. Sabieite-2H and sabieite-3R intergrowths appearing to be single crystals. FOV 2.55mm. RPR specimen and stacked image composite from 7 individual images.



Figure 3. Carlsonite partial crystal. The material is extremely rare and photogenic specimens have not been found. FOV 1.89mm. RPR specimen and stacked image composite from 4 individual images.

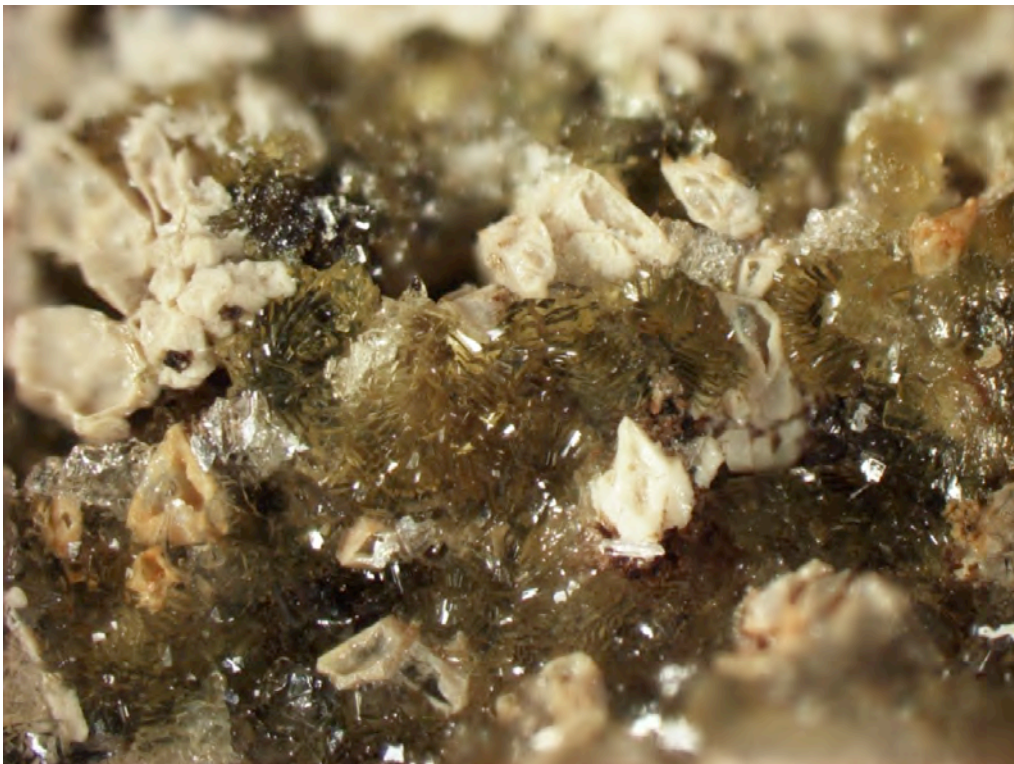


Figure 3. Huizingite-(Al), showing the aggregates of ridged crystals that resemble prehnite. FOV 1.29mm. RPR specimen and stacked image composite from 8 individual images.





Diamond Macle with Mineral Inclusions

## From Gemology to Mineral Physics & Back Again

Including an Update on a Gem of the Future: Nano-Polycrystalline Diamond

**Elise A. Skalwold**

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*Earth & Atmospheric Sciences Department, Cornell University*

In the author's ever-expanding experience of the world of gems, the study of gemology has led her on an unexpected and fascinating journey into the realms of mineralogy and high-level mineral physics research. Through a behind-the-scenes tour of her own collaborative research projects, this presentation gives the audience a taste of the complex scientific efforts which directly or indirectly support the day-to-day gemological science on which the gem industry relies, but which often remain relatively invisible. Central to the story are her co-researchers and other colleagues who enrich the quest for understanding and interpreting this fascinating world.

The thread which binds this journey is the intense investigation of a blue crystal included within a diamond macle. Over a four year period, some of the most technologically advanced instrumentation in the world has yielded volumes of data and a conclusion that this pleochroic crystal is olivine, though as yet no conclusive reason for its anomalous color. Nonetheless, the high degree of scrutiny to which this diamond and its inclusions have been subjected is in itself a remarkable story and provides insights into a world deep within the Earth – arguably one of its last frontiers and one which is otherwise inaccessible.

Inextricably linked to this story is the Diamond Anvil Cell (DAC), a remarkable instrument used in high pressure research. Not only does the DAC utilize gem quality diamonds in its own construction, it is also used to study the Deep Earth environment in which diamonds form. Gemmy nano-polycrystalline diamond (NPD) plays an important role in both the DAC and in our understanding of natural gem diamonds.

**Elise A. Skalwold** is an Accredited Senior Gemologist, curator and author involved in research and curating at her alma mater, Cornell University (B.Sc. 1982). She is a Graduate Gemologist (G.G.), trained in residence at the Gemological Institute of America Robert Mouawad Campus located in Carlsbad, CA. While living in Thailand she worked in the famous gem markets of both Chanthaburi and Bangkok and pursued studies at the Gem & Jewelry Institute of Thailand for which she was



Quartz Crystals

subsequently elected a Fellow of the Gemmological Association of Great Britain (F.G.A.). She is an active member of the Society of Mineral Museum Professionals (SMMP), a world-wide network linking curators from large and small institutions from which members draw on combined expertise.

As well as having co-authored the 415 page book The Edward Arthur Metzger Gem Collection and presently working on a companion volume to it, Ms. Skalwold is an author/co-author of gemology and mineralogy papers featured in *InColor, Gems & Gemology, The Journal of Gemmology* and *Rocks & Minerals Magazine*. Passionate about gemology, she is actively involved in bringing this science into a university setting for the benefit of students and non-students alike – this is the quintessential theme of her paper “Scholarly Treasure: The Role of Gems in a University Setting” presented at the 2013 GIA-sponsored first-ever Gemological Session of the Geological Society of America (GSA) 125th Anniversary Annual Meeting. For her review of the Gemological Session please see: “Gemology bears triumphant tidings: a review of the historic 125th Anniversary Annual Meeting of the Geological Society of America (GSA)” [http://www.nordskip.com/GSA\\_Gemology\\_Session.pdf](http://www.nordskip.com/GSA_Gemology_Session.pdf). Her speaking engagements have recently included the Manhattan Gemological Institute of America Alumni Association Chapter, the New York Mineralogical Club (co-founded by George F. Kunz in 1886), the Rochester Mineralogical Symposium and the 11th Annual Sinkankas Symposium [Ruby] held at the Gemological Institute of America in Carlsbad, CA.

#### **Selected recent projects include:**

- Skalwold, E.A. and W.A. Bassett. (2016) **Blue minerals: exploring cause & effect**. *Rocks & Minerals*, Vol.91, No.1, pages 61-75
- Skalwold, E.A. and W.A. Bassett. (2015) **Double Trouble: Navigating Birefringence**. Chantilly, VA: Mineralogical Society of America. 20 pages (booklet).
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## **43rd RMS Exhibits**

**Barbara Sky** - Miniature Pyrites

**Bob Morgan** - Pyrite

**Bob Morgan** - Found in Tucson, 2016

**Bruce Gaber** - Some Favorites

**Carl Francis** – Peñas Blancas Quartz

**Dale Russell** - COLLECT BIG - or stay home!!

**David DeBruin** - New Acquisitions

**David Joyce** - TBA

**Don Lapham** - TBA

**Eric Grundel** - Images of Tri-State Minerals

**Fred Haynes** - Zinc Minerals

**George Loud** - Tri-State Minerals

**George Loud** - Tri-State Minerals

**George Thompson** - TBA

**Gordon Jackson** - Belvidere Mountain

**Gordon Jackson** - Belvidere Mountain

**Harvard Museum (Kevin Czaja)** - TBA

**John Betts** - Recent Acquisitions

**MMGM** - Mined by Frank Perham

**New York State Museum (Marian Lupulescu)** - TBA

**Terry Huizing** - TBA

As of 4/4/16

*Cover Art by Susan Robinson*

