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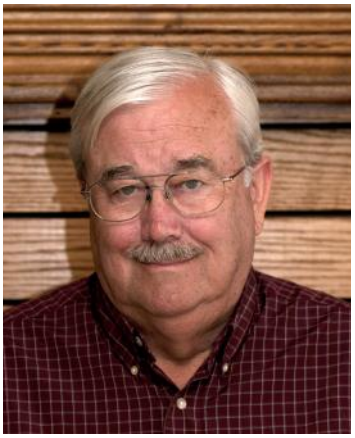
to promote, support, protect and expand the collection of mineral specimens and to further the recognition of the scientific, economic and aesthetic value of minerals and collecting mineral specimens.

Inside This Issue



President's Message
By William W. Besse

I have just a few quick reminders and announcements.

Friends of Mineralogy items for your agenda if you are coming to Tucson in February:

* National General Meeting,
A meet and greet where chapter representatives can tell the assembled members what they have been doing and what the future holds Hotel Tucson City Center, 475 N Granada Ave, Tucson, AZ 85701, Tuesday, February 11, 4:00 – 6:00 P.M.

* National Board Meeting …has moved and will be at University of Arizona Administrative Annex Building, Room 104-106, 220 West 6th Street (Northeast of the intersection of St. Mary's Road/6th Street and Granada/Main Avenues. I know it is crazy but both streets change name there.), Tucson, AZ 85721, Saturday, February 15, 7:00 – 10:00 A.M. It is VERY important that people park only in parking spaces marked "Visitor Parking."

You are being asked to vote for national board members. The ballot is in this newsletter. Please vote!

We still have no listings for Symposia next year. Please send us your information to be added to the website.
Hope to see many of you in Tucson, soon.

NATIONAL OFFICERS

PRESIDENT: William Besse; wwbesse@gmail.com
VICE PRESIDENT: Alexander Schauss; alex@aibmr.com
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TREASURER: Gloria Staebler; PO Box 234, Arvada, CO 80001; gastaebler@aol.com
WEBMASTER: Bill Besse; wwbesse@gmail.com
PUBLICITY CHAIRPERSON: Gail Spann; bikingail@aol.com
EDITOR: Beth Heesacker; 4145 NW Heesacker Rd., Forest Grove, OR 97116, heesacker@coho.net

NATIONAL BOARD OF DIRECTORS

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Randy Marsh; marsh.rg@pg.com
William Besse; wwbesse@gmail.com

Terms expire in February, 2021 just before the general meeting :
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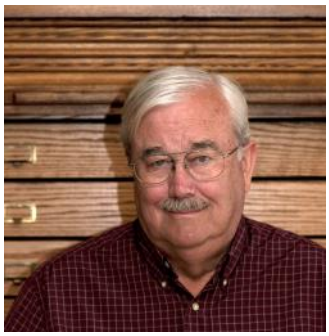
Nominations for FM Board of Directors

Gloria Staebler

Bio not submitted

William W. Besse



Mineral collector for over 40 years, Member of Tucson Gem and Mineral Society, Member of META (Mineral Enthusiasts of the Tucson Area),Past President, Webmaster, and other positions of the Mineralogical Society of Southern California, President and Webmaster of the Friends of Mineralogy, National. Bachelor of Arts - Geography and Master of Science – Geology, California State University, Los Angeles. Jewel Tunnel Imports, a mineral wholesale company, 22 years, Rocks & Minerals Magazine, Associate Cartographer, over 20 years

Matt McGill

Ever since opening my first geode as a child, I've fostered a fascination with minerals that has evolved from a curiosity to a passion. Recently I've had the opportunity to increase my involvement in the mineral community as a member of the Young Mineral Collectors leadership team, and would love the opportunity to leverage my skill set in the Friends of Mineralogy organization to assist with modernization and expansion efforts. I have 15 years of people and operations management, project management, process improvement, training/educational development and delivery, and recruitment strategy experience with advanced skill in various programs such MS Excel/MS Office suite, Google suite, various Adobe products, and more. Additionally, I currently manage a remote workforce and am proficient with tools that enable remote coordination, collaboration and engagement.

Jessica Robertson

(Pacific Northwest Chapter)

Like many collectors, Jessica has been collecting rocks and minerals for as long as she can remember. She grew up hearing stories about mineral shows and the Friends of Mineralogy from her grandmother, Kay Robertson. The earth science bug hit hard, and she went on to obtain a B.A. in geochemistry from Whitman College and a M.S. in geology from Central Washington University. Since then, she has been working as an environmental geologist in the Puget Sound area and raising a family. She takes every opportunity to share earth science and minerals with kids in her community. Most recently, Jessica has developed and conducted a "Geology for Storytellers and Gamers" series of classes for 4th graders to teens, explaining the real science and stories behind earth science topics they might encounter in popular games and fiction. In recent years Jessica has become more involved in the larger mineral collecting community, and is looking forward to what the future brings.

Jeanine N. Mielecki

Jeanine N. Mielecki is a mineral enthusiast, writer, editor, and entrepreneur who calls Chicago home. Jeanine began collectingat the age of four when she found a piece of chert with a crinoid fossil impression. This sparked a lifelong love of the earth sciences. Because the Midwest US is rich in fossils and geodes, her early years were spent collecting these. Along the way, Jeanine acquired lapidary skills, although she would rather be collecting in the field. Jeanine's passion crystallized into collecting fine minerals when she attended her first Tucson show in 2014. Jeanine is a member of Friends of Mineralogy, Midwest Chapter, Chicago Rocks & Minerals Society, Earth Science Club of Northern Illinois, Des Plaines Valley Geological Society, and Fluorescent Mineral Society, Midwest Chapter. Current vice president of the Chicago Rocks & Minerals Society Jeanine is responsible for arranging monthly speakers and programs. Jeanine also founded and administers daily CRMS's educational Facebook page with 900+ likes. For more than 20 years, she has been CRMS's public relations chair. Jeanine is a past president, treasurer, and silent auction chair. Under her presidency, CRMS was the first club in Illinois to adopt the Future Rockhounds of America badge program developed by the American Federation of Mineralogical Societies for children. Jeanine works monthly behind the scenes with CRMS's newsletter editor to acquire and develop articles, fact check, and copy edit *The Pick and Dop* Stick, which has earned numerous top national and regional awards. She also assists several other earth science clubs in publicizing their special events. Jeanine earned her B.S. Journalism from the University of Kansas.

BOARD OF DIRECTORS
YOUR FRIENDS OF MINERALOGY BALLOT

Please take time to support Friends of Mineralogy by voting. You may vote for up to four positions from the nominated candidates or by writing in candidates of your choice who would be willing to serve. Ballots should be sent to **Linda Smith,** FM National secretary by email at vanegas3@charter.net .

Ballots must be received before the Board meeting to be held on the morning of Saturday, February 15, 2020.

Ballot for Friends of Mineralogy Board of Directors: Term 2020-2021 (Feb 2020 - Feb 2021)

Vote for up to **four** positions.

_____ Gloria Staebler
_____ William W. Besse
_____ Matt McGill
_____ Jessica Robertson
_____ Jeanine N. Mielecki
_____ Write in _____
_____ Write in _____

Pollucite Occurrences and Finds in the Peoples Republic of China

By Mark Jacobson

CHAPTER 2:

Compilation and summary of pollucite occurrences and finds in the Peoples Republic of China. Created by Dittrich (2017, p. 24-33) and revised-updated by M. I. Jacobson to December 2019

Nanping no. 31, Nanping pegmatite field, 7.64 km west of Nanping, just north of Xiyuantou village and 2.1 km north of Xikeng village, Yanping district, Fujian Province. The mine portal is located at WGS84, UTM 50 R, 609755.00 m E, 2948904.00 m N. The underground mine exploits four steeply dipping, parallel intruded pegmatite veins. All the veins are individually and similarly zoned. Each pegmatite in the group averages 300-600 meters long, with a vertical depth of about 90 meters and each are up to 20 meters in width. Pollucite was found as an accessory mineral in the quartz-spodumene-amblygonite intermediate zone (zone IV) of Rao et al. (2014, p. 181). A chemical analysis of pollucite is provided in Chou and Yang (1985, p. 99) with additional analyses in Yang et al. (1995, p. 111).

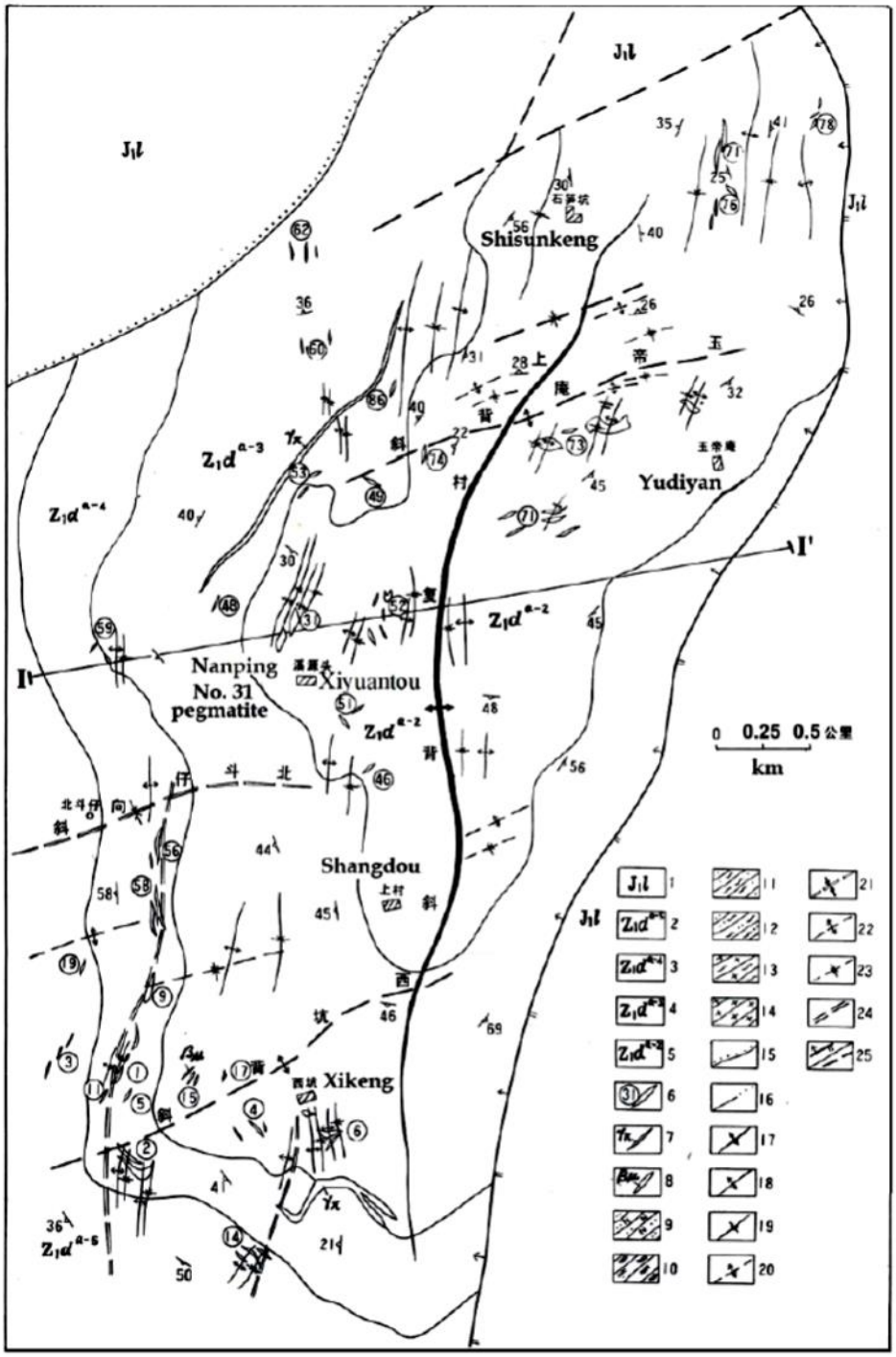


Figure 1. Location map of the Nanping no. 31 pegmatite and adjacent pegmatites. Map adapted from Chou et al. (1985, facing page 18). 1 下侏罗统梨山组 Lower Jurassic Lishan Formation, 2 to 5 下旦统迪口组下第五段 ~二岩性段 The second to fifth lithologic members of the Dikou Formation, 6 伟晶岩脉 (群) 及骗号 pegmatite veins with

their identifying pegmatite number, 7 花岗斑岩 porphyric granite 8 辉绿坋岩 diabase, 9 长石-石英砂岩 feldspar-quartz sandstone, 10 云母片岩mica schist, 11 斜长云母片岩 plagioclase-mica schist, 12 云母斜长片岩, mica-plagioclase schist, 13 黑云母斜长变粒岩 biotite-plagioclase granulite, 14 斜长变粒岩 plagioclase granulite, 15 不整合地层界线 unconformity, 16 实推测地层界线 stratified conformable contact, 17 晚期复背斜 late stage anticline, 18 晚期次级背斜late secondary anticline, 19 晚期次级向斜 late secondary syncline, 20 早期复背斜 early anticline, 21 早期复向斜 early syncline, 22 早期次级背斜 early secondary anticline, 23 早期次级向斜early secondary syncline, 24 挤压破碎带, shear zone, 25 实, 推测断层 solid line with dip – observed fault, dashed line – possible fault

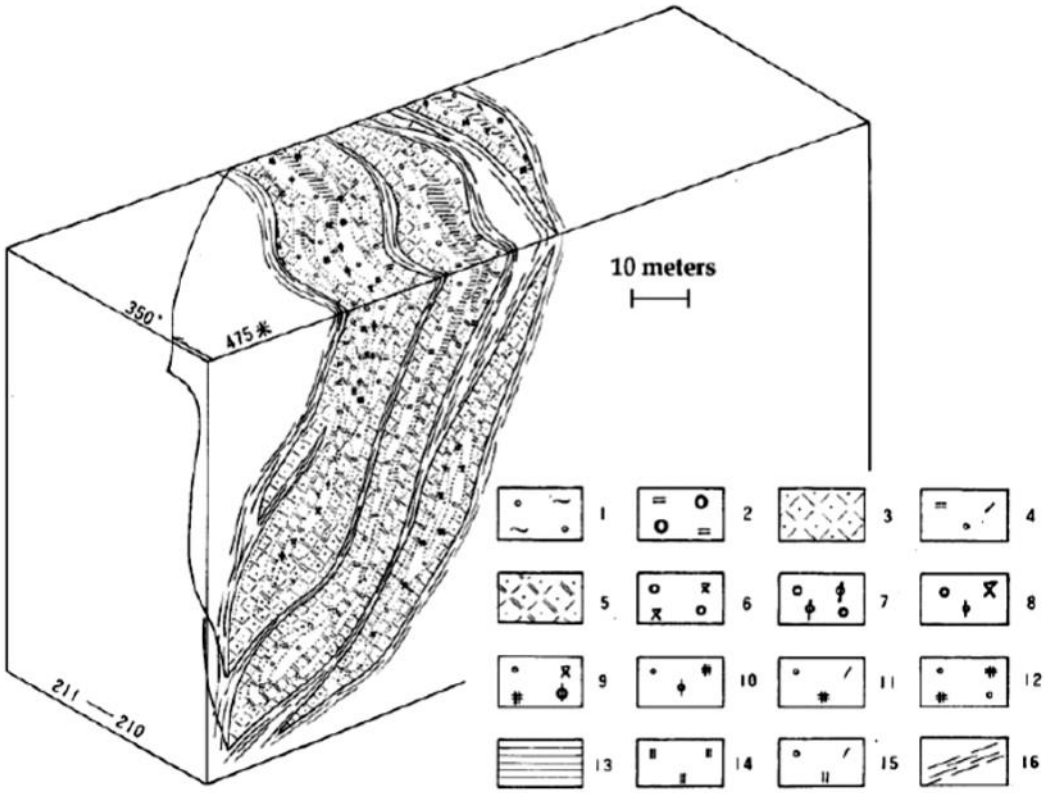


Figure 2. Legend for Nanping no. 31 pegmatite cross section

1 石英 -细鳞白云母带 quartz – fine grained muscovite zone, 2 石英 - 白云母带 quartz – muscovite zone, 3 石英 - 钠长石带 quartz – albite zone, 4 石英 - 白云母 - 钠长石带 quartz-muscovite-albite zone, 5 石英 -腐锂辉石 - 钠长石细合 quartz – altered spodumene – albite unit, 6 石英 – (腐) 锂辉石细合 quartz – rotten (meaning altered) spodumene unit, 7 石英 – 磷锂铝石细合 quartz – amblygonite unit 8 石英 – (腐) 锂辉石 – (蚀变) 磷锂铝石带 quartz – rotten spodumene– altered amblygonite zone containing pollucite, 9 石英 – 钾长石 – (腐) 锂辉石 – (蚀变) 磷锂铝石带 quartz – microcline – rotten spodumene – altered amblygonite zone, 10 石英 – 钾长石 – 磷锂铝石细合 quartz – microcline –amblygonite unit, 11 石英 – 钾长石 – 钠长石带 quartz – microcline – albite

zone, 12 石英 – 钾长石细合 quartz – microcline unit, 13 钾长石块体 blocky microcline, 14 绿色白云母带 green muscovite zone, 15 石英 – 钠长石– 绿色白云母细合 quartz – albite –green muscovite unit, 16, 片岩和变粒岩 schist and granulite. Cross section adapted from Chou et al. (1985, facing page 58).

Yichun Nb-Ta Lithium quarry (mine no. 414), Yichun municipality district, Yichun prefecture, Jiangxi Province. The group of hilltop quarries are located approximately 22.5 km southsoutheast of Yichun city center, 3 km south of Xinfang (new place) tungsten deposit village or 5 km east of Lukou (road mouth)Village. One of the surface pits is located at WGS84, UTM 50R, 255,180 m E, and 3,060,970 m N, Within the Yichuan Topaz-Lepidolite Granite, pollucite is found as inclusions in quartz up to a few micrometers in diameter and adjacent to albite as small masses that reach up to 200 micrometers in diameter. The volume of this material is sufficiently large that the mine operation probably recovers the cesium as an economic element (Wang et al. 2004).

Guanpo no. 3 (possibly no. 303), no. 1 (possibly no. 301), no. 15, no. 669, no. 672, no. 687, and no. 703, Guanpo pegmatite field, southwest of Guanpo town, Lushi County, Sanmenxia Prefecture, Henan Province. Some of these pegmatites might be in the adjacent to the west, Shaanxi province. Pegmatite maps of no. 1 and 3 pegmatites that contain pollucite zones are displayed in Lu, et al. (2010). Pollucite with analyses from Henan are provided in Wang et al. (1981, p. 81) and Chen (1981), A pegmatite cross section of the no. 1 and no. 15 pegmatites are illustrated in Chen (1981). Pegmatites numbers 15, 669, 672, 687 and 703 have pollucite chemical analyses provided in Chen (1981).

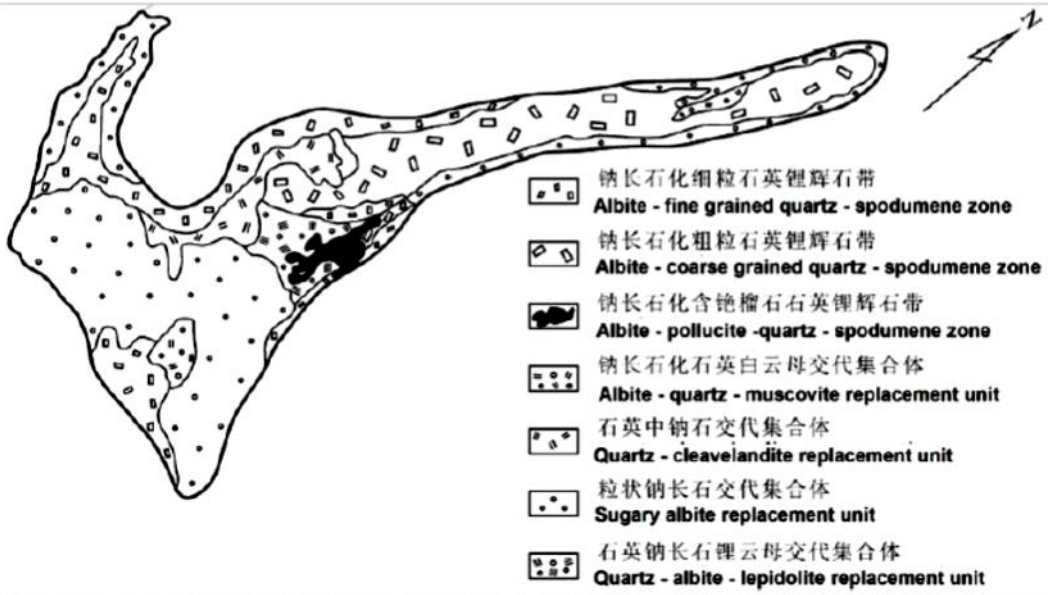


Figure 3. Guanpo pegmatite no. 1 geologic map. No scale provided for map, from Lu, et al. (2010, p. 24). The pegmatite might possibly be only 10 meters thick at the north end.

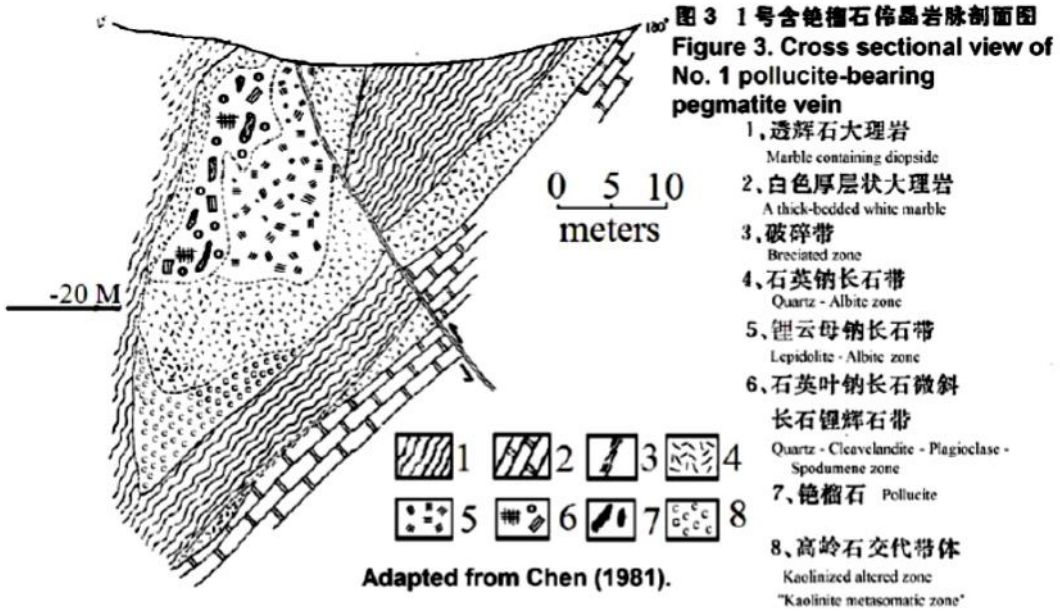


Figure 4. Geologic cross section of Guanpo pegmatite no. 1. Modified from Chen et al. (1981, p. 53).

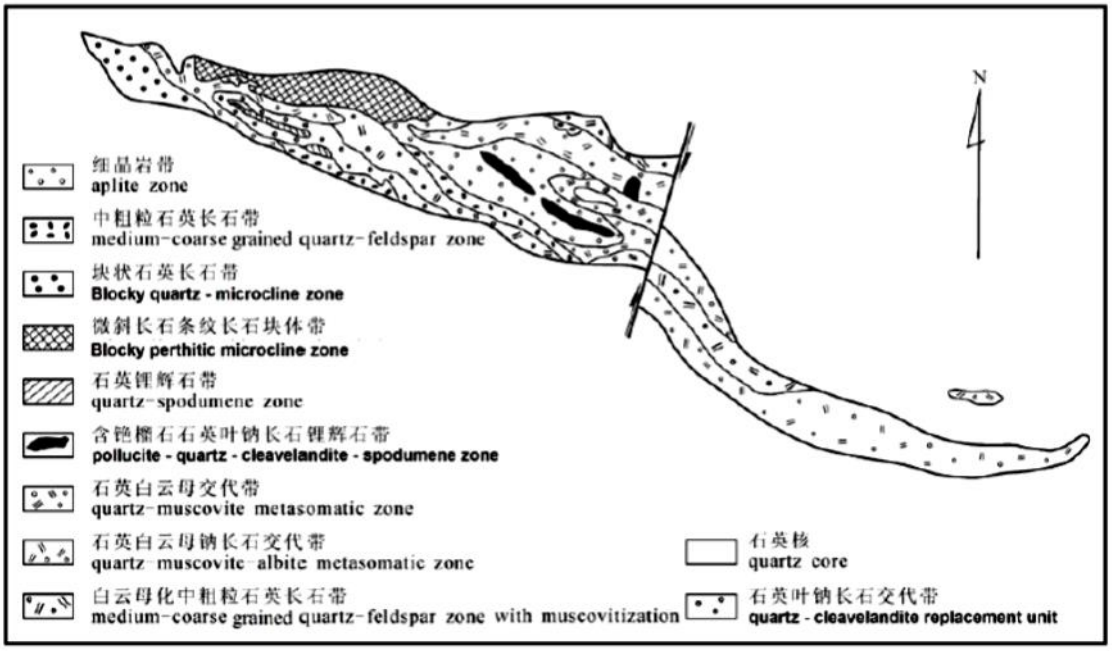


Figure 5. Geologic map of Guanpo pegmatite no. 3. No scale provided for map, from Lu, et al. (2010, p. 24). The pegmatite might possibly be 20 meters thick in the central area.

Guanpo no. 309, Guanpo pegmatite field, southwest of Guanpo town, Lushi County, Sanmenxia Prefecture, Henan Province. The mine portal for this pegmatite is

located at WGS84, UTM 49S, 473,633 m E and 3,748,132 m N. Fan et al. (2013) in his abstract mentions that Luanshiweiite "is closely associated with quartz, a"F-dominant analog of luanshiweiite", montebrasite, pollucite and bismutotantalite as well as Na-, and Ca-poor but Li-, and OH or F-rich tourmaline… " A pegmatite map showing the location of Guanpo no. 309 and others is illustrated in Fan et al. (2013, p. 714) in figure 1, and possibly in Chen et al. (1993, p. 60), in figure 8-2.

A lithium-bearing pegmatite, Mufushan Mountains, Tongcheng County, Xianning Prefecture, Hubei. Pollucite with a chemical analysis, x-ray diffraction lines and physical properties was described from an unnamed pegmatite by Zhang et al. (1984) and Chengdu College of Geology (1974). No details were provided on its location.

Koktokay No. 3 pegmatite [AKA Keketuohai No. 3, Altai no. 3, Mongolian Altai no. 3], Koktokay pegmatite field, Fuyun County, Xinjiang Autonomous Region. The main pit is located at WGS84 datum, UTM 45T, 713,287 m E, and 5,231,957 m N. This pegmatite has been extensively mined since circa 1940, and was a major supplier of rare materials including pollucite for Russia and China after WW II. Economic amounts of pollucite were mined from the coarse-grained ("sliced") albite-lepidolite zone with lesser amounts from the muscovite-coarse-grained albite zone (Wang et al. (1981, p. 5-7, 77). Lu and Wang (1997, p. 285) stated that the "Cs mineralization zone … [occupied] about 0.02% volume of whole pegmatite." "The ore quantity of each pollucite nest reaches several tons or so, moreover the cesium oxide ore grade is rather high (Yin et al. 1994, p. 31). Tang et al. (2013, p. 7) stated that between 1950 to 1999, 86 tons of pollucite was mined. Zhu and Zhu (1996, p. T111.18) stated that in the muscovite-coarse grained albite zone "A very large white crystal of pollucite was found in this zone near the quartz core at the 1216 meter level of the open pit. It is 3.2 m long , 2.0 m wide and weighed 12 tons." Chemical analyses of pollucite are provided in Wang (1981) and Chen and Wang (1985, p. 99).

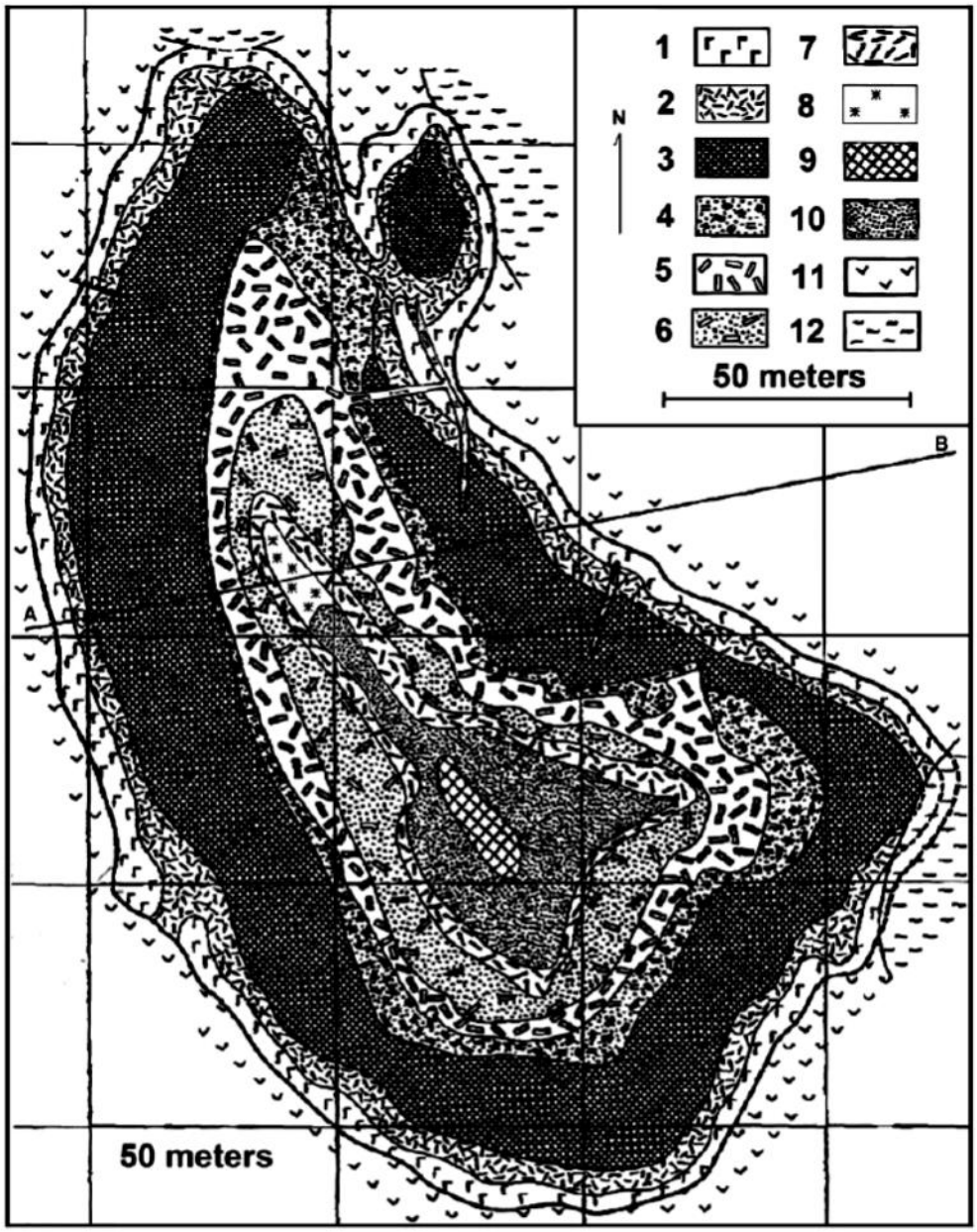


Figure 6. Map of the Keketuohai No. 3 pegmatite. Drawn original by N. A. Solodov, 1952. Adapted from Solodov (1960, p. 875), Wang et al. (1981, p. 5-7), and Luan et al. (1996, p. 134). Legend for map and cross section: 1 - Graphic granite, partly albitized, 2 - fine-grained, sugary albite – microcline zone, 3 - blocky microcline –quartz zone, 4 - quartz – muscovite zone, 5 - quartz - cleavelandite – spodumene zone, 6 - quartz – spodumene zone, 7 - fine-textured platy albite with accessory pollucite zone, 8 - albite - medium -grained lepidolite with major pollucite masses apical zone, 9 - blocky microcline (lower core basal) zone, 10 - coarse-grained quartz (upper core apical) zone, 11 – gabbro, and 12 – overburden.

The pegmatite description by Luan et al. (1996, p. 127 and 134) clearly highlighted

the pollucite-richest zone at the structurally highest position on the most northern part of the albite-lepidolite zone which was renamed as a quartz-pollucite zone in Lu and Wang (1997, p. 281), although it had been completely mined out before 1996. Published geologic maps of the Keketuohai #3 pegmatite can be confusing due to changes in terminology, and poor drafting, scale size and publication printing. The best published maps are in Solodov (1960) and Luan et al. (1996). Hu, et al. (2004) provides numerous analyzed compositions of pollucite from several different zones.

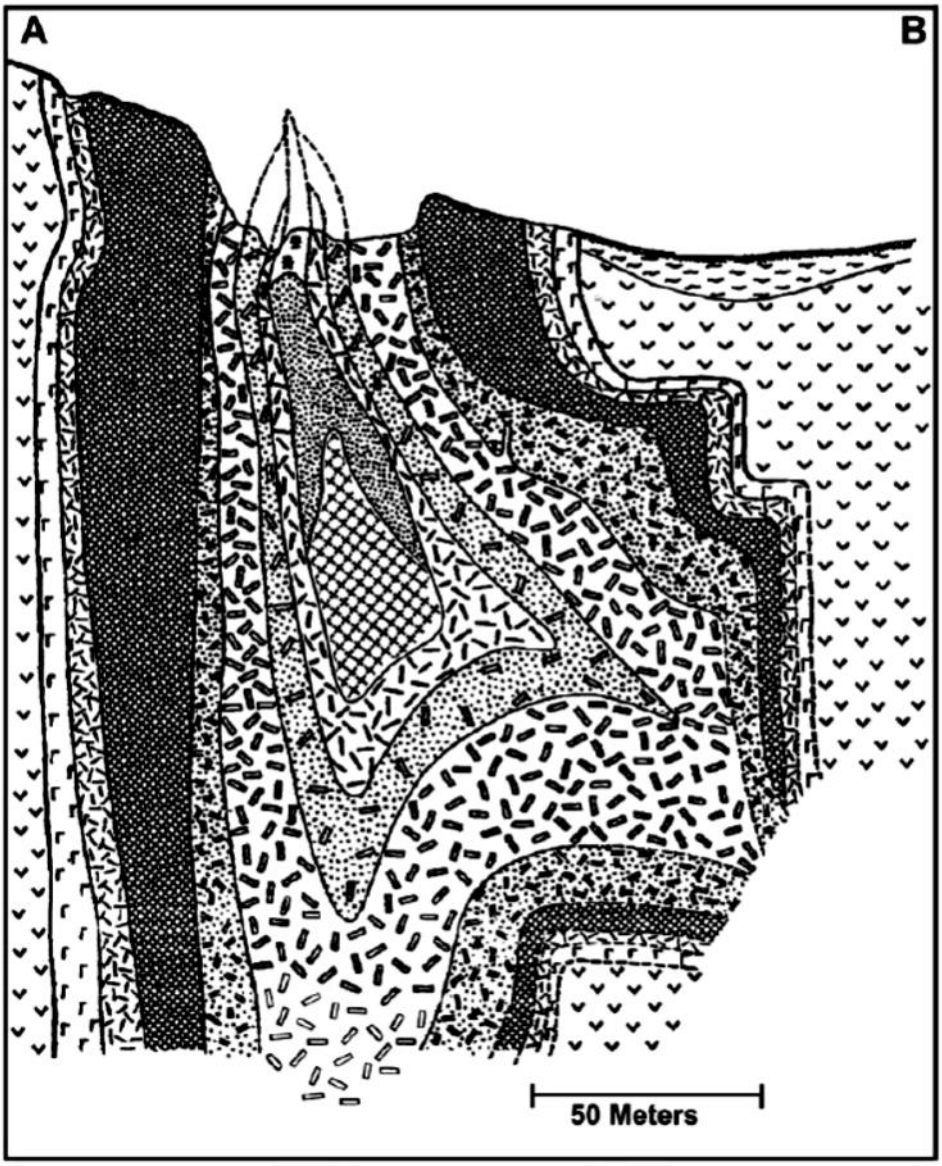


Figure 7 Geologic cross section A - B across the Keketuohai no. 3 pegmatite. Same legend as in Figure 4. The major pollucite bearing zone is the tongue-shaped cross cutting zone at the top, exposed at the surface.

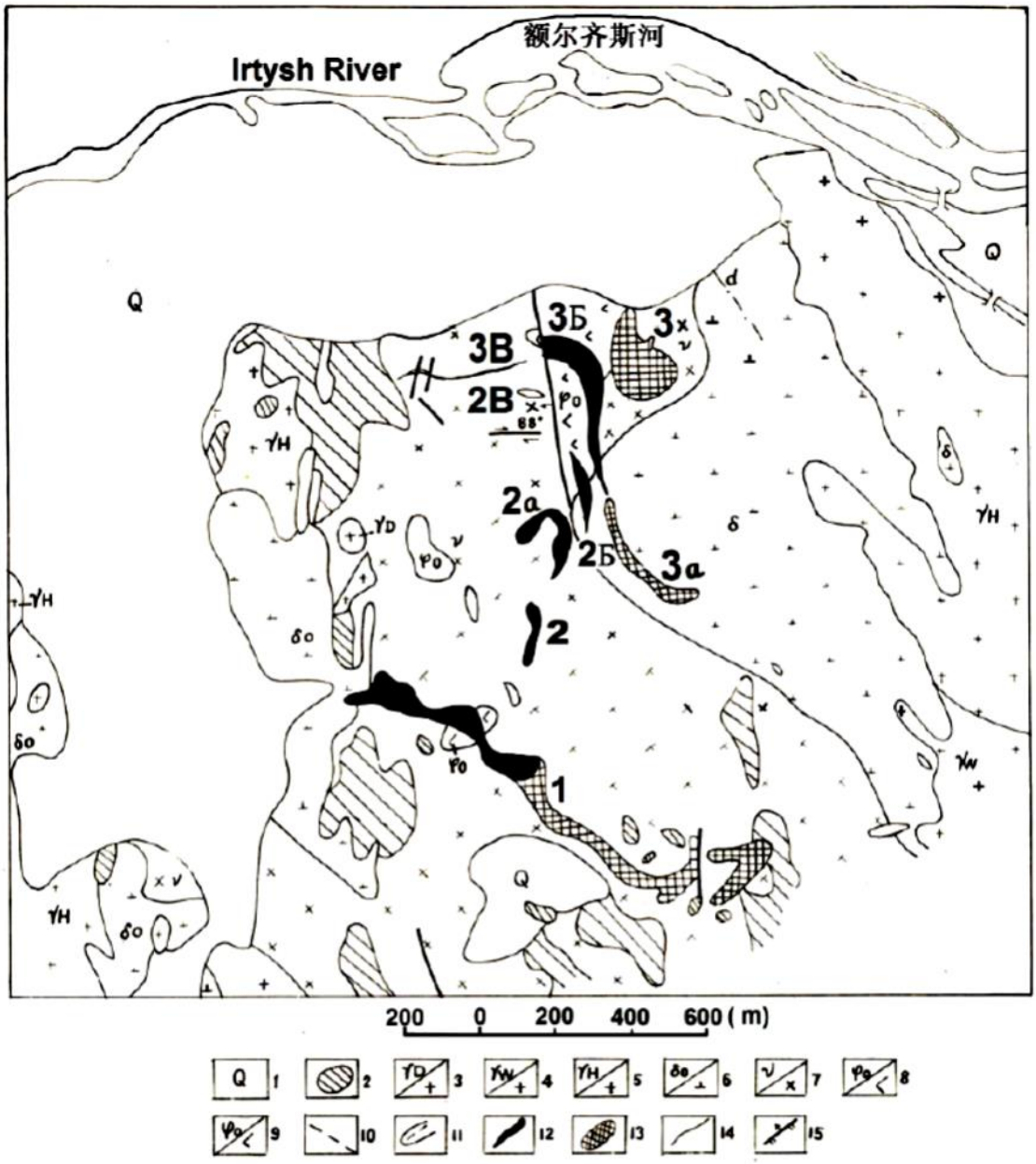


Figure 8. Pegmatite distribution in the Keketuohai pegmatite field. Map adapted from Luan et al. (1996, p. 86). Legend: 1 - 第四系沉积物 Quaternary sediments, , 2 – 一十字石 - 石英-黑云母片岩 cross-stone quartz – biotite schist, 3 - 淡色花岗岩 light-colored granite, 4 - 微晶花岗岩 microcrystalline granite, 5 – 黑云母花岗岩 biotite granite, 6 - 石英闪长岩 quartz diorite, 7 - 角闪辉长岩 hornblende gabbro, 8 - 辉长闪长岩 –gabbro diorite, 9 - 角闪岩- hornblende, 10 - 腊色岩墙 ochre rock wall, 11 - 闪长-长英岩脉 dioritic - quartz veins, 12 - 铌钽矿化伟晶岩脉 niobium-tantalum bearing pegmatite veins, 13 - 锂铍铌钽铯综合矿化伟晶岩脉 lithium-beryllium-niobium-tantalum bearing pegmatite veins pegmatite veins, 14 - 一地质体接触界线 geologic contact boundary, 15- 断层 fault

Koktokay No. 1 pegmatite, Koktokay (keketuohai) pegmatite field, Fuyun County, Xinjiang. Pollucite is listed for this pegmatite in Wang et al. (1981, p. 77) without additional information.

Koktokay No. 2Б pegmatite, (not No. 2B) Koktokay (keketuohai) pegmatite field, Fuyun County, Xinjiang. Pollucite is listed for this pegmatite in Wang et al. (1981, p. 77) without additional information.

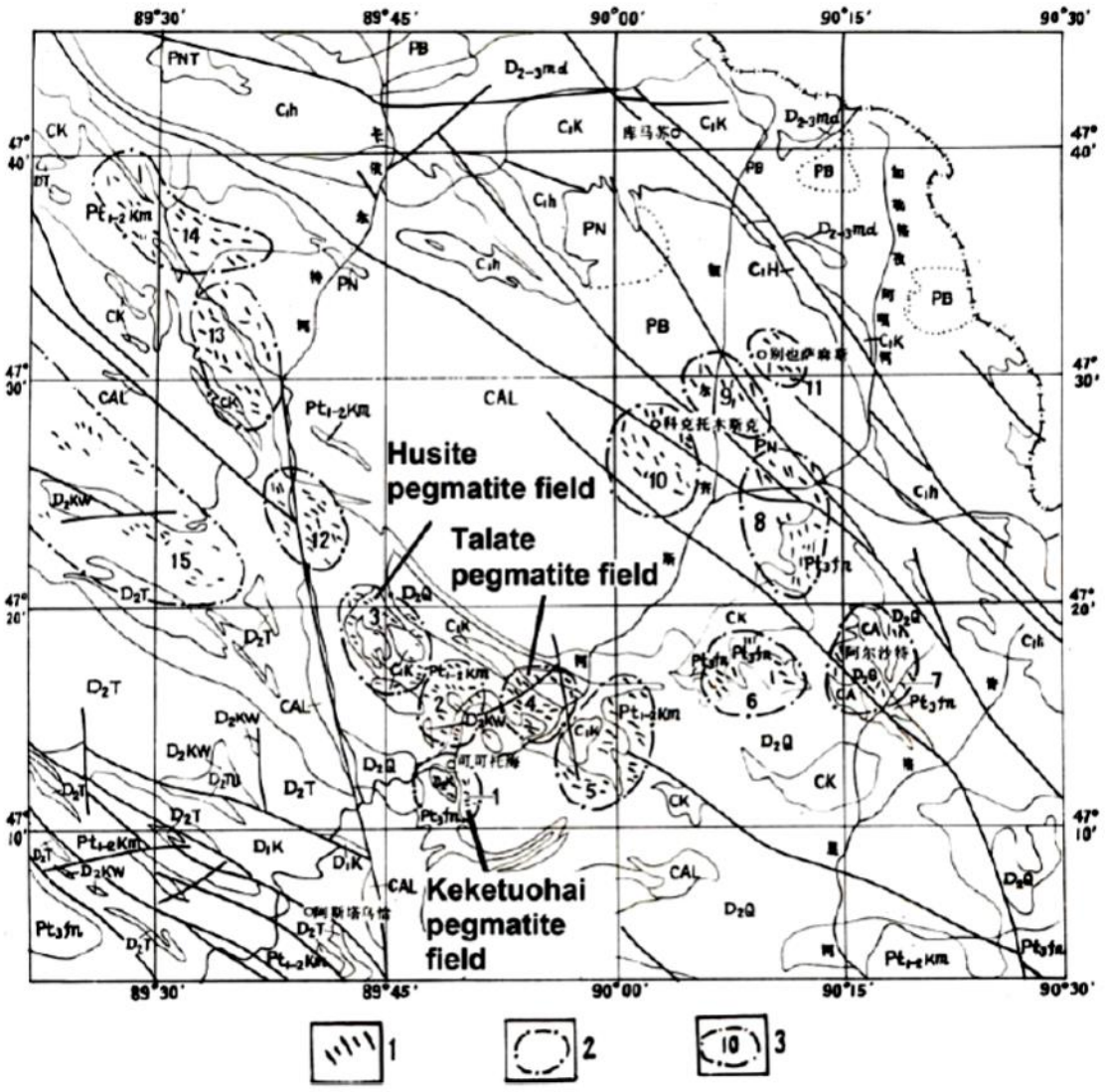


Figure 9. Location of the Keketuohai (1), Husite (3), and Talate (4) pegmatite fields. Map adapted from Luan et al (1996. p. 81). 1 – individual pegmatites, 2 – pegmatite field area, and 3 – pegmatite field number.

Talate No. 317 pegmatite (TL-317), due east of Keketuohai town, Fuyun County, Xinjiang. Pollucite is listed for this pegmatite in Wang et al. (1981, p. 77) without

additional information and in Luan, et al. (1996, p. 81, 83, 127). A photograph of pollucite in quartz is illustrated in Zou and Li (2006, plate 21) in the back of the book.

Husite no. 1 pegmatite (FS- 1), north west of Keketuohai town, Fuyun County, Xinjiang Pollucite is listed for this pegmatite in Luan et al. (1996, p 81, 83, 127).

Kuru'erte pegmatite field, due north of Keketuohai town, Yili Hasake Autonomous Prefecture, Xinjiang. Pollucite is not mentioned as occurring in this field by Luan et al. (1996, p. 81, 83) or Wang et al. (1981). No evidence of this occurring in the district has been found.

Jiamukai pegmatite field, Fuhai County, Aletai Prefecture, Xinjiang. Pegmatite. Tang et al. (2005) does not mention pollucite from this pegmatite. No evidence of this occurring in the district has been found.

Jimg'erquan (Jingerquan) pegmatite field, Huangshan-Jing'erquan ore belt, Hami Countt, Hamal Prefecture, Xinjiang. Pegmatite. Tang et al. (2005) does not mention pollucite from this pegmatite. No evidence of this occurring in the district has been found.

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Minerals of the Penn/MD Materials Quarry, Fulton Township, Lancaster County, Pennsylvania, Part 3, Magnetite, Magnesioferrite-Magnetite Series, and Chromite-Magnesiochromite Series

Ronald A. Sloto, P.G.
West Chester University

Introduction

The Penn/MD Materials quarry, owned and operated by the H&K Group, produces aggregate from ultramafic rocks of the Baltimore Mafic Complex, known locally as the State Line Serpentinite District. This complex of ultramafic and associated gabbroic rocks is believed to be a remnant from the roots of an island arc complex formed about 490 to 510 million years ago (Smith and Barnes, 1998; Smith and Barnes, 2008).

All analyses were performed at the West Chester University Center for Microanalysis and Imaging, Research and Training (CMIRT). Imaging and chemical analyses were done using an FEI Quanta 400 environmental scanning electron microscope integrated with an Oxford AZtec X-ray energy dispersive spectrometer (SEM-EDS). Samples were unpolished and uncoated.

The author thanks the H&K Group and Jay Lang for access to the quarry and Robert C. Smith II for his helpful comments and insights.

Magnetite Series Fe_3O_4

Magnesioferrite-Magnetite Series $MgFe_2O_4$ to Fe_3O_4

Magnetite forms a solid-solution series with magnesioferrite. Magnetite contains three iron atoms per four oxygen atoms, and magnesioferrite contains two iron atoms and one magnesium atom per four oxygen atoms. Both species can be massive or form black metallic octahedral crystals; they are visually indistinguishable.

Small blebs and stringers of a black metallic mineral are ubiquitous in the Penn/MD Materials quarry (figs. 1 and 2). A large, solid mass weighing 24 pounds was found by Jay Lang, the quarry manager (sample RS-4250). The author carried out an informal study to determine how many of the black metallic minerals were magnetite and how many were chromite. Twenty-two samples (in addition to sample RS-4250) were collected from all five levels of the quarry. Some were associated with magnesite and dolomite; most were associated with various colors and textures of serpentine. Samples RS-4094 (fig. 3), RS-4142 (fig. 4), and RS-4200 were minute octahedral crystals. All other samples were massive. The samples were analyzed by SEM-EDS (table 1).

None of the samples were chromite. All samples, except RS-4250, appeared to be mixed with some serpentine. To "remove" the serpentine after analysis, it was assumed that all silica was due to the presence of serpentine; the serpentine was then "removed" from the analysis.

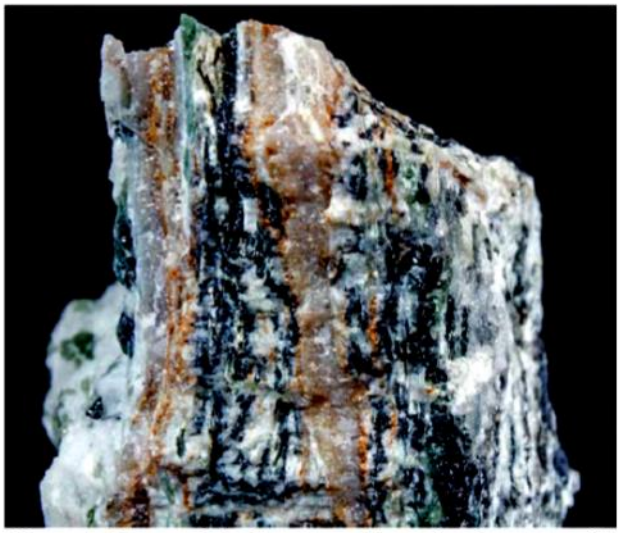

Figure 1. Magnesioferrite-magnetite series in magnesite from the Penn/MD Materials quarry, sample RS-4250.

Figure 2. Magnetite from the Penn/MD Materials quarry, sample RS-4250.

Table 1. X-ray energy dispersive spectrometer (EDS) analysis of black metallic minerals from the Penn/MD Materials quarry. Values are median values in weight percent.

Sample No.	O	Mg	Si	Ti	Cr	Fe	Ni	Au	Notes
RS-4094	41.40	9.49	4.37	0.01	0.02	46.58	0.55	0	1
RS-4098	30.17	4.83	1.32	0.03	2.94	59.64	0.45	0	
RS-4112-B	29.09	6.68	1.53	0.09	0.47	67.28	0.36	0	
RS-4113	34.02	13.61	8.94	0.04	0.12	41.97	0.60	0	
RS-4125	30.93	4.81	0.53	0.04	0.44	61.70	0.52	0	
RS-4138	22.56	6.88	2.25	0.05	0.13	67.69	0.47	0	
RS-4142	40.38	4.46	2.23	0.02	0.04	52.48	1.11	0	1
RS-4200	38.93	6.03	2.46	0.02	0.02	52.18	0.42	0	1
RS-4201	31.79	5.52	2.33	0.12	0.46	58.95	0.73	0	
RS-4203	30.63	6.80	2.95	0.06	0	59.13	0.61	0	
RS-4225-C	26.94	0.56	0.10	0.16	0.15	71.64	0.52	0.01	
RS-4240	34.17	3.82	0.81	0.18	0.00	60.33	0.51	0.03	
RS-4241	28.84	5.25	1.07	0.18	0.04	66.27	0.39	0.00	
RS-4244-B	30.00	3.93	1.10	0.17	0.01	66.13	0.63	0.11	2
RS-4246-B	32.15	4.05	0.80	0.19	0.01	63.90	0.43	0	
RS-4250	32.50	5.69	0	0.04	0.24	62.01	0.53	0	3
RS-4251	22.18	4.82	0.61	0.01	0.16	70.83	0.68	0	2
RS-4254	22.98	6.17	0.82	0.01	0.11	68.90	0.55	0.02	
RS-4255	23.45	1.01	0.66	0.21	0.55	73.36	0.54	0	
RS-4256	31.73	2.83	1.37	0.14	0.14	63.29	0.62	0	
RS-4257	23.19	1.28	0.74	0.25	0.90	73.17	0.62	0	
RS-4258	25.90	8.18	5.33	0.10	0.11	58.47	0.55	0	
RS-4291	21.66	0.37	0.31	0.13	0.16	76.36	0.47	0	4

Notes: 1 Octahedral crystals
2 Greatest gold value = 0.19 weight percent
3 Sample contained no silica
4 Magnetite

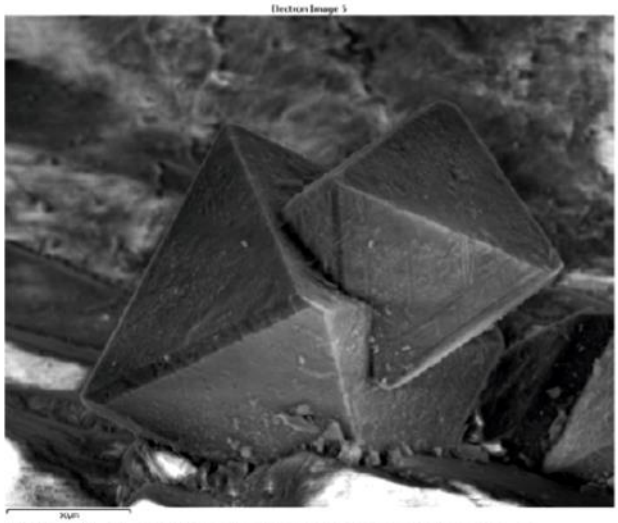

Figure 3. Scanning electron microscope image of magnesioferrite-magnetite series crystals from the Penn/MD Materials quarry, sample RS-4094. Magnification is approximately 740 X.

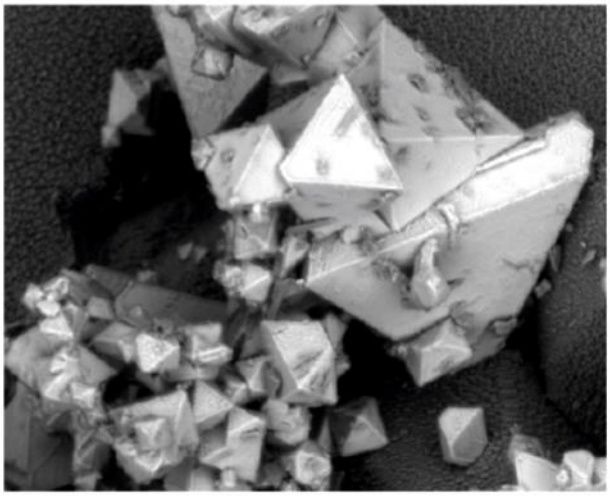

Figure 4. Scanning electron microscope image of magnesioferrite-magnetite series crystals from the Penn/MD Materials quarry, sample RS-4142. Magnification is approximately 740 X.

All samples (except RS-4291) still contained magnesium, indicating that they were not end-member magnetite but in the magnesioferrite-magnetite series close to the magnetite end member. Sample RS-4291 was end-member magnetite. Most of the samples (table 1) also contained nickel, chromium, and titanium; some samples contained a trace of gold. The presence of gold was initially detected by an X-ray fluorescence (XRF) spectrometer analysis by Sloto and Degnan (2011). The number of magnesium atoms ranged from 0 to 0.64 per 4 oxygen atoms (fig. 5), indicating that most samples (87 percent) were closer to the magnetite end of the series than the magnesioferrite end. None of the samples were end member magnesioferrite.

Chromite-Magnesiochromite Series

$FeCr_2O_4$ to $MgCr_2O_4$

Chromite ($FeCr_2O_4$) is an iron chromium oxide mineral belonging to the spinel group. Magnesium can substitute for iron as it forms a solid solution with magnesiochromite ($MgCr_2O_4$). The name chromite is commonly used for any chromium-rich mineral of the spinel group, particularly for the chromite-magnesiochromite series; it is used here.

In May 2019, the author was attracted to a serpentine boulder on the fifth level of the quarry containing a significant amount of a black metallic mineral. The serpentine in the boulder was a bright green color unlike the color of any other serpentine in the quarry. The author broke off several pieces (figs. 6 and 7) and analyzed the black metallic mineral; it was in the chromite-magnesiochromite series (table 2). A few days prior to the author's return to the quarry on June 2, a landslide occurred, which blocked access to the fourth and fifth levels. The fifth level was abandoned and allowed to flood (fig. 8), and the chromite-bearing boulder on the fifth level was no longer accessible.

The analysis of a sample from this single occurrence (table 2) indicated the presence of a minor amount of serpentine and minor amounts of aluminum, calcium, manganese, titanium, vanadium, and zinc. Assuming that the presence of silica was due to the presence of serpentine, the analysis gave an approximate formula of $Fe_{0.72}Cr_{1.06}Mg_{1.43}Al_{0.21}O_4$. The sample contained more magnesium than iron and is closer to the magnesiochromite end of the series than the chromite end.

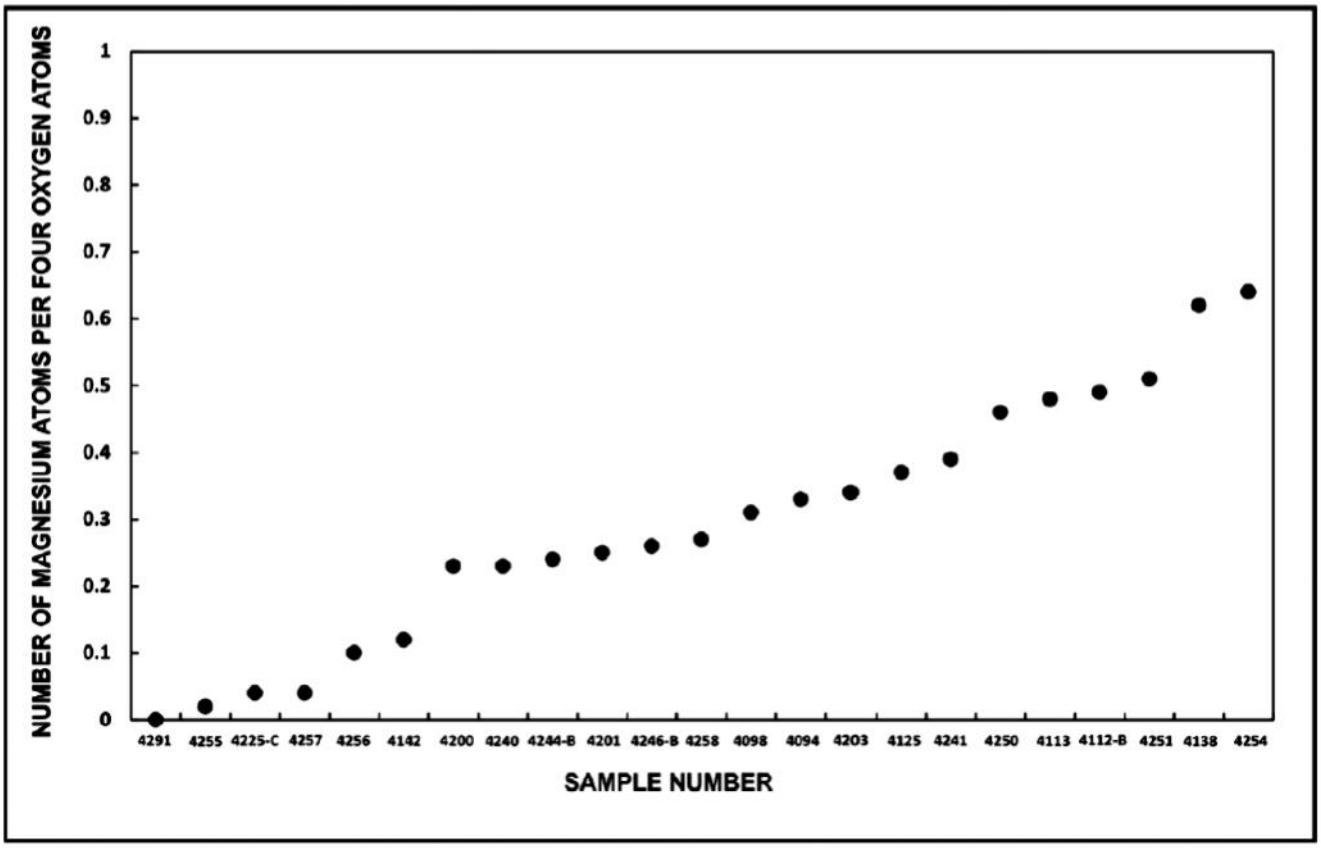

Figure 5. Graph showing the number of magnesium atoms per 4 oxygen atoms in 23 magnesioferrite-magnetite series samples from the Penn/MD Materials quarry.

Table 2. Results of X-ray energy dispersive spectrometer (EDS) analysis of chromite from the Penn/MD Materials quarry. Values are the median, minimum, and maximum of 16 spectra in weight percent.

	Cr	Fe	O	Mg	Al	Si	Ca	Ti	V	Mn	Zn
Median	32.45	22.89	30.58	10.03	0.70	0.58	0.15	0.03	0.03	0.60	0.04
Minimum	27.69	20.13	28.98	4.36	0.26	0.29	0.00	0.00	0.00	0.50	0.00
Maximum	36.94	29.30	32.04	17.39	2.88	0.89	0.24	0.11	0.10	0.87	0.25

The bright green color of the matrix surrounding the chromite was caused by the presence of chromium in the matrix. The serpentine outside of the chromite area was much less intense in color and did not contain chromium. The chromite (fig. 6) appears to have a schlieren habit (Pearre and Heyl, 1960; Smith and Barnes, 2008).

Figure 6. Massive chromite from the Penn/MD Materials quarry.

Figure 7. Disseminated (bird's eye) chromite from the Penn/MD Materials quarry.

Figure 8. Photograph showing landslide in the Penn/MD Materials quarry (right of center). The flooded fifth level is in foreground. Photograph taken on October 11, 2019.

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From Your Editor

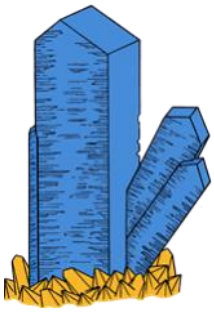
I invite all chapters and anyone from the Members At-Large to either email me their chapter newsletters or a President's report each quarter. Chapters would really like to learn from each other what is working for them or what exciting things are happening like field trips or presentations.

I request that they be emailed since I can store them in one location and not have to search around the internet for every chapter that posts theirs. Just add me to your email list. Beth Heesacker, heesacker@coho.net .

I also invite your pictures of your minerals to grace the pages of this newsletter.

Also please let me know if your President changes so I can keep the officers' page up to date.

Your articles can make this Bulletin a greater resource for mineral collectors around the world. Thank you in advance.



Interested in a wonderful resource for teaching children about minerals?
Check out the books and other resources at Diamond Dan Publications.
http://www.diamonddanpublications.net/

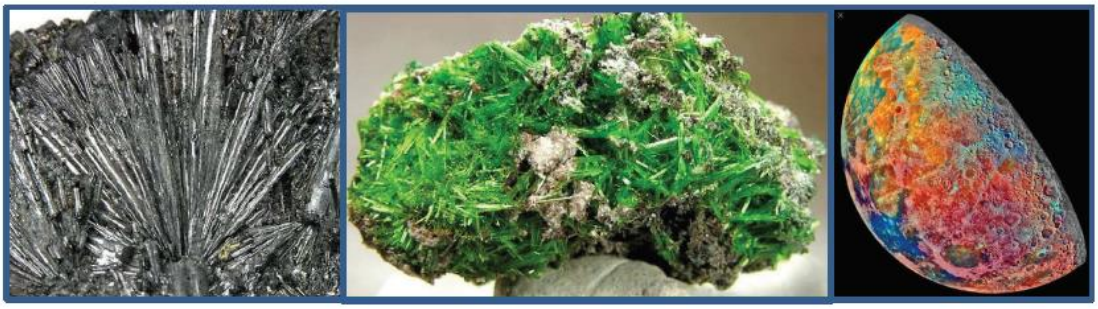
COLORADO CHAPTER UPDATE

http://friendsofmineralogycolorado.org/

Your Report could be here!

MIDWEST CHAPTER UPDATE

www.fommidwest.org



Friends of Mineralogy Midwest Chapter

8th Annual Mineralogical Symposium

Hosted by the Miami University Karl E. Limper Geology Museum

DATE: Saturday March 14, 2020
TIME: 9:00 AM – 5:00 PM
LOCATION: 152 Shideler Hall (Spring Street & Patterson Ave), Miami University, Oxford, OH
CONTACTS: Randy Marsh (vpprograms@fommidwest.org or 513-515-7890)
Ken Bladh (president@fommidwest.org or 937-390-1742)

STATEMENT OF PURPOSE: FM's objective is to promote, support, protect, and expand the collecting of mineral specimens, while furthering the recognition of the scientific, economic, and aesthetic value of minerals and mineral collecting. The purpose of the symposium is to bring together professional and amateur mineral enthusiasts to share information of common interest, to build a local mineralogical community and to provide students with an opportunity to share their work and receive public recognition for it.

DETAILED AGENDA:

9:00-9:30	FM Midwest Chapter Meeting (open to all)
9:30-10:30	*Dr. John Jaszczak*[1]: **Criminal Minerals**
10:30-11:00	*Dr. Travis Olds*[2]: **Adventures for new minerals from Utah, Colorado, & the Czech Republic**
11:00-11:30	*Dr. Claire McLeod*[3]: **Extraterrestrial Mineralogy: Insights from 5 new Lunar Meteorites**
11:30-1:00	Lunch Break Armstrong Student Center and Museum Viewing
1:00-1:30	*Dr. John Rakovan*[4]: **Split Minerals**
1:30-2:00	*TBD*
2:00-2:30	*TBD*
2:30-2:45	Break
2:45-4:45	Student Talks (20 min each)
4:45-5:00	Awards for Student Talks

[1] *Dr. John Jaszczak is Professor and Interim Chair, Department of Chemistry, Michigan Technical University.*

[2] *Dr. Travis Olds is the new curator of the mineral collection at the Carnegie Museum of Natural History.*

[3] *Dr. Claire McLeod is an Assistant Professor of Petrology and Geochemistry at Miami University. Her research involves looking at the mineralogical make up of returned Apollo samples and lunar meteorites in order to evaluate the geological history of the Moon.*

[4] *Dr. John Rakovan is a Professor of Mineralogy at Miami University and an executive editor of Rocks & Minerals.*

MISSISSIPPI VALLEY CHAPTER UPDATE

Your Report could be here!

NEW JERSEY CHAPTER UPDATE

https://fomnj.wordpress.com/

Your Report could be here!

PACIFIC NORTHWEST CHAPTER UPDATE

www.pnwfm.org

Check out our 2019 Symposium report provided by Erin Delventhal on Mindat. Thank you, Erin.

https://www.mindat.org/a/fom_pnw_2019

AND

Plan on joining us for our next Symposium in October 2020

How Colors and Crystallography Contribute to the Aesthetics of Minerals

PENNSYLVANIA CHAPTER UPDATE

www.rasloto.com/FM/

Symposium on Pennsylvania Mining and Mineralogy

November 2019

The Friends of Mineralogy – Pennsylvania Chapter held our 2019 Symposium and field trip on the first weekend in November. On Saturday, November 2, the Symposium was held at Franklin & Marshall College in Lancaster, PA. There were select mineral dealers (by invitation only), a silent auction, refreshments, and plenty of opportunities for visiting with fellow enthusiasts.

After a great deal of last-minute effort in making the arrangements for the meeting, FM-Pa President Joe Marchesani had a short moment to relax as the group arrived.

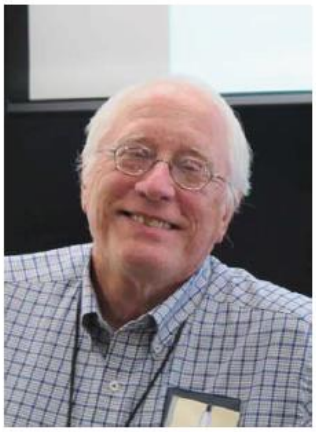
Roger D. K. Thomas, Professor Emeritus of Geosciences, welcomed the group to F&M. He spoke about the evolution of complex systems that exist in the natural world, and told some interesting stories from his research career.

Bill Stephens spoke about **Amethyst Occurrences in Southeastern Pennsylvania - Classic Locales and Recent Discoveries.** He reviewed some geological investigations of Lancaster County and other sites and showed videos of collecting.

Karenne Snow spoke about **Minerals and Their Type Localities**, particularly those from Pennsylvania and New York. Following the presentation, the audience was able to examine her collection of specimens from type localities.

Making the Case for Celestine as the Pennsylvania State Mineral was Peter Heaney's topic. He reported on his connections with German museum curators who tracked down the type specimens in Dresden, Berlin, and Freiberg. Celestine was first collected ~1790 in Pennsylvania by Schütz and analyzed by Klaproth in Germany.

Ryan Mathur discussed **Uranium-Lead Dating of Calcite Veins from Rocks in Pennsylvania and Implications of the Ages.** Much of this work is on the Marcellus Shale, to understand fluid migration and natural gas generation, but also provides insight into mineral emplacement in other situations.



Ron Sloto helped prepare the group for the Sunday field trip by speaking on **Minerals of the Penn/MD Materials Quarry, Fulton Township, Lancaster County, Pennsylvania.** He reported results of microanalysis, some of which are also in the article on page 4 of this issue.

Field Trip Chair Tom Pankratz further discussed Penn/MD Quarry and provided instructions for field trip participants. Some changes had taken place there since last year's trip. A landslide closed the fifth level on the Pennsylvania side, and the new operations across the border in Maryland have been expanding.

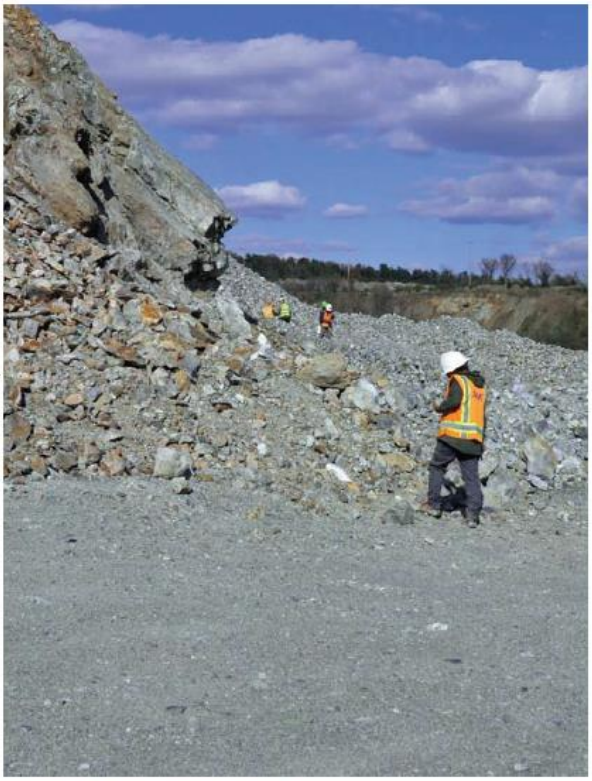
Also on Saturday, a brief official meeting of the membership was held in the morning. No Board members were up for re-election this year, and no one had volunteered to run as a new member, so there was no election. President Joe Marchesani reviewed the year's successful activities, including several collecting trips.

Following the presentations in the afternoon, a brief **Board of Directors meeting** was held. The four incumbent officers were re-elected to their positions (see page 8). Attendance at the current Symposium was reported as 45.

On Sunday, field trip participants met at Penn/MD Materials Quarry for a pleasant morning of collecting. Thanks go to the H&K Group personnel who have generously cooperated with FM-Pa Chapter to allow us to collect.

M. Dunton photo

M. Dunton photos



J. Moore photos

J. Moore photo

SOUTHERN CALIFORNIA CHAPTER UPDATE

Fall Symposium, October 26 & 27, 2019 This fall California State University's Zzyzx Desert Studies Center hosted our program in the Mojave Desert, 6 miles west of the town of Baker, San Bernardino County, California. Jason Wallace, Zzyzx Station Manager, welcomed our gathering of 45 members and guests with "A Brief History of Soda Springs". Dr. Robert Housley spoke on the history of the Blue Bell mines in the Soda Mountains and Turquoise Mountain East Camp site north of Halloran Summit. The two days of field collecting provided a wide variety of minerals for many of our first time visitors including mottramite, aragonite, caledonite, malachite, desclozeite, vanadinite, linarite, brochantite, wulfenite, pyromorphite, dioptase, pingguite, hemimorphite, mimetite, aurichalcite, galena, jarosite, quetzalcoatlite, rosasite, chrysocolla, and turquoise. Selected photos of these minerals are illustrated in this newsletter. Reynoldsite, a rare mineral discovered at this site in the last decade was not found this trip, leaving that elusive find for another day. Reynoldsite is dark orange brown to black in color with an orange brown streak that escaped our diligent hunting efforts. Considering that Mindat currently lists 102 different species of minerals at this location, we were very fortunate to collect 20 plus minerals in a short 4-hr visit. On Sunday, Oct 27th, 39 dedicated SCFM members drove into the East Camp region of Turquoise Mountain to inspect numerous diggings finding old mining artifacts, bed springs, and turquoise specimens worth collecting for jewelry making.

Image 1: The view of the Mojave Desert terrain from the top of the cliff above Blue Bell mine sites north of Zzyzx Desert Studies Center, near Baker, CA., location of our Fall 2019 Symposium.

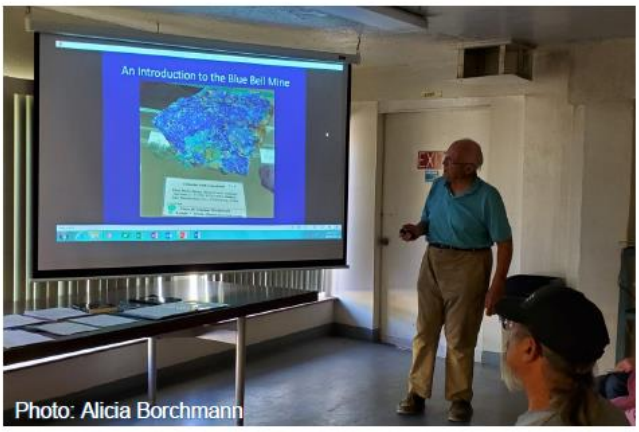


Image 2: Dr. Robert Housley, SCFM Board member, speaker and field trip guide, prepares the 45 participating members for Blue Bell Mine specimen collecting with his power point presentation.

Images 3: Jason Wallace, Zzyzx Site Manager, shared his perspective of the area from the time of Native American presence, up to the modern research center via "A Brief History of Soda Springs".

Image 4: Dr. Don Buchanan, President of SCFM, greets early morning arrivals ready for our first day of speakers and field collecting at Blue Bell mines.

Image 5: Silent Auction offerings of micromount specimens to historical maps, captured the attention of all participants as well as Desert Studies Center staff.

Image 6: Some of the 39 Fall 2019 Southern California Friends of Mineralogy field trip group were captured Sunday morning before the Turquoise diggings trip adventures. The eager Saturday's group was larger, at 45 participants, escaping our photograph opportunity. The larger group included over a dozen students from University of California, Cal State, San Bernardino Valley College and Chaffey College as we reach out to the younger generations.

Photo: Patti Smith

Image 7: Zzyzx Rd sign marker.

Image 8: Linarite is a somewhat rare, crystalline mineral that is known among mineral collectors for its unusually intense, pure blue color. It is formed by the oxidation of galena and chalcopyrite and other copper sulfides.


Photo: Alicia Borchmann


Photo: Gregor Losson

Images 8 - 12: Minerals from Blue Bell mines.

Left, Image 9: Dioptase crystals magnified for micromount

Right, Image 10: blue caledonite crystals.

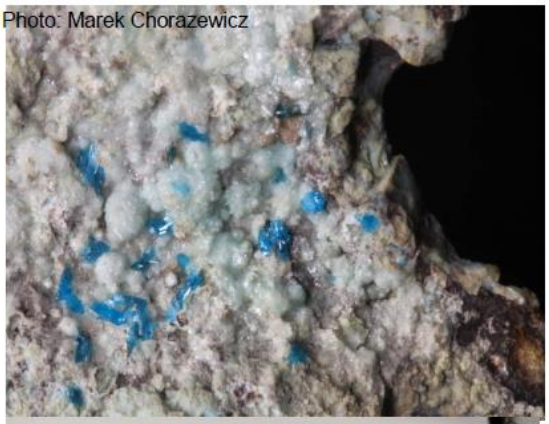


Photo: Marek Chorazewicz


Photo: Gregor Losson

Left, Image 11: Wulfenite on Chrysocolla.

Right Image 12: Chrysocolla primary mineral with variety of associated minerals adding color to its basic background.


Photo: Bill Smith


Photo: Marek Chorazewicz

Image 13: Field trip collecting site with vehicles parked below the Blue Bell mine hillside and its multiple adits.

Image 14: Not Turquoise. The challenge for mineral collectors then becomes to properly label our specimens.

Images 15,16 & 17 are Turquoise from East Camp region of Turquoise Mountain with a range of blue to green as noted in veins or isolated clumps.

Images 18 & 19: CSU Desert Studies Center oasis pond is a direct contrast with the desolate Mojave Desert terrain surrounding this Soda Lake historical site available for visits in a remote part of California's deserts.

Image 20: Patti Smith and members of Fallbrook Gem & Mineral Society enjoy Zzyzx hot catered breakfast entrees.

Image 21: Patrice Copeland, husband Tim and her employees from Lahotan Water Authority cap off a field trip day with stories of their adventures at Blue Bell Mine's adits and mineral collecting sites.

NATIONAL MEMBERS "AT-LARGE"

Your Report could be here!

Would someone like to speak up for the "at-large" members?
Needs, wants, comments?

FM AFFILIATES

The Friends of Mineralogy is a long-time affiliate of The Mineralogical Record magazine. The magazine was founded in 1970 by John White, who was at that time a curator in the Mineral Sciences Department of the Smithsonian Institution. With the initial help of a financial backer, Arthur Montgomery, White succeeded in launching and bootstrapping the fledgling publication to the point where it was marginally self-sustaining. After seven years as editor and publisher, White stepped aside for a new Editor, Wendell Wilson.

Since then the Mineralogical Record has grown steadily in size, quality and prominence, thanks to the contributions of over 700 authors, photographers, artists, advertisers and donors. It has become a collective labor of love on the part of the entire mineralogical community worldwide. It is the only journal to have a new mineral species named in its honor (minrecordite), and it is the only journal to have received the Carnegie Mineralogical Award. Subscriptions, back issues, books and a variety of free databases are available online at www .Mineralogical Record .com.

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