

FM friends of mineralogy colorado chapter



Friends of Mineralogy - Colorado Chapter Newsletter No. 1, January, 1993

January Meeting: 7:30 p.m., Thursday, Jan. 14, 1993
Denver Museum of Natural History
Ricketson Auditorium (entrance on west side of Museum)

Program: "Topaz"

by Eugene E. Foord

Over the past several years, Gene Foord has been conducting studies of the chemistry and crystallography of topaz and has learned some noteworthy new things about the mineral. He has found that there are two distinct kinds of topaz: fluorine-rich topaz, $\text{Al}_2\text{SiO}_4\text{F}_2$, is orthorhombic; hydroxyl-rich topaz, $\text{Al}_2\text{SiO}_4(\text{F},\text{OH})_2$, containing up to 30 mol. percent OH substitution for F, is triclinic. Most topaz from pegmatites and rhyolites is fluorine-rich; hydroxyl-rich topaz is known from hydrothermal veins, the best known examples of which are the yellow, orange, pink, to violet "Imperial Topaz" from Ouro Preto, Brazil, and the pink to red crystals from Katlang, Northwest Frontier Province, Pakistan. Gene has also recorded new observations about the color, trace element chemistry, and fluorescence of topaz. He has presented some of this information in talks to several other Denver area groups, and gave a preliminary talk about his work on topaz to FM back in 1989, but tonight's talk will be a complete update about what he has learned.

If you would like to read more about Gene's work on topaz, a 3½-page summary of his observations was printed in our FMCC newsletter two years ago, in Nov. 1991, "Topaz, $\text{Al}_2\text{SiO}_4(\text{F},\text{OH})_2$, a favorite of the mineral kingdom", the abstract of a talk Gene gave at the Rochester Symposium. If you didn't belong to FM then, or haven't saved the newsletter (doesn't everyone?), copies of his abstract will be available at our meeting.

Needless to say, aside from the mineralogic information, Gene will have a spectacular assortment of photographs of mineral and gem topaz specimens. Bring your friends!

There will be one short addition to this evening's program. Ed Raines is in charge of photography for the Minerals of Colorado Update book (see further below for more details on the Update). Ed has been photographing key Colorado specimens in public and private collections for the Update; to give us a sampling of how the work is progressing, Ed will show a selection of slides illustrating a few of the specimens he has photographed.

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FMCC 1992 officers:

Pete Modreski, pres.

Ed Raines, sec.

Jim Hurlbut, vice-pres.

Eunice York, treas.

Ed Gray, director

Glen Johnson, director

Dave Weller, director

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Rhodochrosite: Thanks go to Dan Kile and Bryan Lees for preparing the following article about the recent operation of the Sweet Home mine in Buckskin Gulch near Alma. This article has also submitted to the AFMS for inclusion in their newsletter. The AFMS, by the way, produces a bimonthly newsletter in a newspaper-like format, which is currently sent to a few of the officers of each member club. They plan to begin sending this newspaper to every member of each Federation club--to improve communication between the Federation and its members. (There seems to be some question as to whether the AFMS really has the funds budgeted for this undertaking, but that is what they plan to do.) So if you start receiving an AFMS newsletter, that is where it came from.

An article about the Sweet Home mine and what a hit its rhodochrosite made at the Denver Show also appeared in the Nov.-Dec. issue of the German magazine *Mineralien Welt*. It was written by Rainer Bode and Dieter Klaus, both of whom attended the show and visited the mine in September. The article includes color photos, including stereo pairs of pockets in the mine taken by our own Chauncey Walden. We'll have a copy of the issue at the January FM meeting.

Minerals of Colorado Project: After many years of effort by many persons, the authors of the Friends of Mineralogy - Denver Museum of Natural History - U.S. Geological Survey "Minerals of Colorado" update project are now in the final stages of completing the manuscript. Their stated goal is to complete the text by the end of January. Robert Cobban, Rick Collins, Eugene Foord, and Jack Murphy are the prime authors, with numerous other people having made contributions now or in the past. As of Jan. 1, all but about 75 out of approximately 780 total mineral descriptions have been completed--see the attached graph. The exact number of minerals depends on how one counts the entries for mineral groups, discredited species, etc.; Gene Foord's latest count is 763 valid mineral species. When all the species writeups are completed, the authors will spend the next few months reviewing each others' sections, and Gene Foord will compile a master complete copy of the manuscript on computer disk. At the same time, we will complete the maps, photographs, and make arrangements for the actual publication. Ed Raines is in charge of photographs, Bill Chirnside is coordinating map preparation, and Jack Murphy will make a formal proposal to the Denver Museum of Natural History for the book's publication. Both black-and-white and color photographs (exact number not yet determined) will be included; most color photographs to be used are being taken now, because quality of color reproduction is best assured by having all photography done with the same type of film and lighting. The book will include either two or four location maps covering the entire state, plus about 5 more detailed maps showing specific parts of the state that have numerous mineral localities.

"Antero Aquamarines": The contract for Mark Jacobson's book to be published by Lanny Ream Publishing has been signed by all parties. A recent letter from Mark reports that he has sent the complete manuscript on computer disk plus drafted diagrams to Lanny, and that he will be sending Lanny the color separates and black-and-white half-tones later this month. A prepublication offer for FM and other Denver Council members to purchase the book at a reduced price will be made (retail cost, softcover, will be \$19.95); we will let you know as soon as details are available.

Topaz: Returning to the topic of topaz, a new book, *Topaz*, written by Don Hoover, in the Butterworth-Heinemann Gem Books series has just been published (1992). Don is a geophysicist with the USGS and a gemologist, and a past member of FM. Don has collaborated with Gene Foord in some joint studies on the properties of topaz. The book is published in hardcover, 207 p., and includes 4 pages of color plates. Don expects to be able to order a number of copies at an author's discount and is willing to pass this discount on to FM members who would like to purchase

a copy. The retail price will be about \$40, and the discount is expected to be approximately 20%. If you are interested in purchasing a copy at the reduced price, please talk to Gene Foord at the January meeting, or give your name to Gene or Pete Modreski. The book has just been printed, so copies will not be available until some time in February or March.

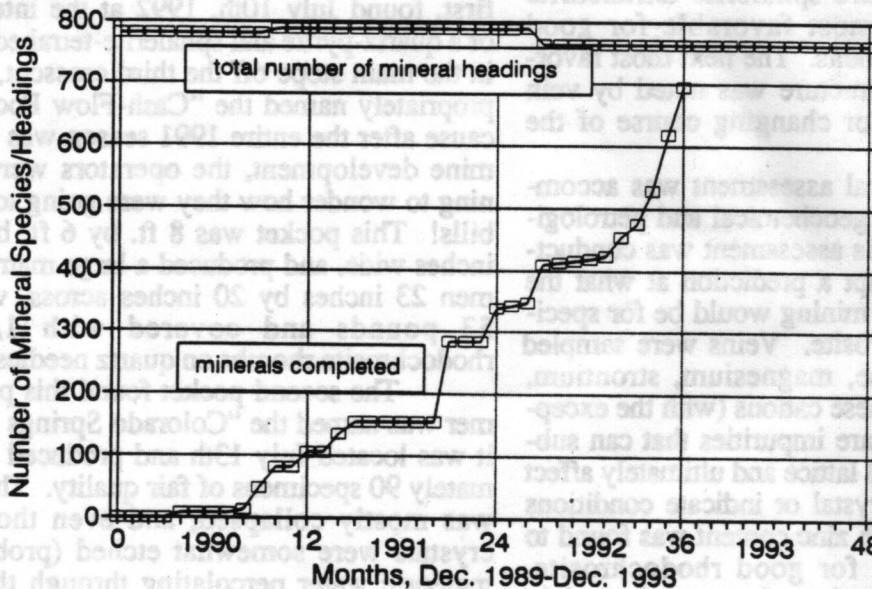
Mining Conference: March 23-26, 1993, the (96th annual) National Western Mining Conference and Exhibition will be held in Denver, co-sponsored by the Colorado Mining Association and the Denver Region Exploration Geologists Society (DREGS). For registration information, contact the CMA at 1340 Colorado State Bank Building, 1600 Broadway, Denver CO 80202, telephone (303) 894-8416.

Please pay your dues for 1993! FM dues are \$13.00 (includes both Colorado Chapter and National FM dues), payable to Friends of Mineralogy in person at our meeting or by mail to P.O. Box 150401, Lakewood, CO 80215-0401. Dues are delinquent as of March 1 and National FM bylaws stipulate that we send them an updated membership list as of that date.

Miscellanea: The rush of the holiday season may be over, but some of your Chapter officers are still being hard pressed to keep up with everything that has needed to be done--hence this newsletter is not longer or mailed sooner than it is. Words for the year: come to our meetings and bring a friend, pay your dues, offer to help us do something, buy and use a good mineral book, leave some for the next guy, read Bill Smith's editorial in the Sep.-Oct. 1992 M.R. about the government's attitude toward mineral collecting and consider doing something about it, enjoy minerals, and have a good year!

Minerals of Colorado Update

Mineral Drafts Completed through 12/92



Recent Activity at the Sweet Home Mine, Park County, Colorado

Daniel E. Kille and Bryan K. Lees

The Sweet Home mine, long noted as a source of some of the world's finest crystallized rhodochrosite, has recently been reopened for the sole purpose of mining crystal specimens. Bryan Lees, of the Collector's Edge, Golden, Colorado, has managed not only to assemble the financial backing and skilled help necessary to initiate a full scale underground mining operation, but to satisfy voluminous State and Federal mining, environmental, and safety regulations.

Mining commenced in 1991; extensive renovation of the site buildings and mine workings required the better part of the year in order to satisfy mining regulations and facilitate an extensive program of exploration. The current portal was driven in the 1920s and required track removal, portal renovation, installation of a ventilation system, and other improvements prior to commencing exploration. A thorough evaluation of the structural geology preceded collecting activity. Four vein systems were identified, and three types of vein intersection defined. Only the late stage, lower-temperature veins produced rhodochrosite, and the intersection of high-temperature quartz-pyrite veins with low temperature sphalerite-tetrahedrite veins proved the most favorable for good rhodochrosite specimens. The next most favorable kind of vein structure was noted by vein flexure (a bending or changing course of the vein).

This structural assessment was accompanied by extensive geochemical and petrological prospecting. This assessment was conducted in order to attempt a prediction at what the best target areas for mining would be for specimen-grade rhodochrosite. Veins were sampled for iron, manganese, magnesium, strontium, calcium, and zinc; these cations (with the exception of manganese) are impurities that can substitute into the crystal lattice and ultimately affect the quality of the crystal or indicate conditions of formation. A high zinc content was found to be most favorable for good rhodochrosite, while iron was indicative of a zone that might produce lesser quality material. Petrographic

work (the study of rocks in thin section) has identified two pulses of mineralization: (1) a high-temperature quartz-pyrite pulse, and (2) a later, lower temperature pulse of sphalerite, tetrahedrite, and galena, carrying with it also the precious metals and rhodochrosite. Age dating and fluid inclusion work are also planned; these techniques are expected to yield additional insight into the paragenesis and temperature of formation of the vein deposits and minerals at the Sweet Home mine.

Pockets in the Sweet Home mine are invariably very narrow and often quite long, frequently showing a "pinch and swell" configuration. This, in conjunction with the intractable and tenacious nature of the surrounding granite has necessitated the development of specialized collecting techniques in order to extract the highly cleavable and soft rhodochrosite crystals intact and on matrix. The most effective tool has been the hydraulic splitter, which, when used in conjunction with specifically placed drill holes around the pocket has enabled the safe removal of matrix specimens. Drill holes and elongated pockets are prospected with an endoscope in order to expedite drilling and pocket collection. Diamond saws have been tried for pocket extraction, but have not been as successful as the splitter.

Since May of 1992, when the mine was again reopened for the season, five more or less noteworthy pockets have been found, each with a distinctive name given by the mine crew. The first, found July 10th, 1992 at the intersection of a quartz-pyrite and sphalerite-tetrahedrite vein in the main stope off the third crosscut, was appropriately named the "Cash-Flow Pocket" because after the entire 1991 season was spent on mine development, the operators were beginning to wonder how they were going to pay the bills! This pocket was 8 ft. by 6 ft. by 2-to-3 inches wide, and produced a large matrix specimen 23 inches by 20 inches across, weighing 53 pounds and covered with 1/2 inch rhodochrosite rhombs on quartz needles!

The second pocket found this past summer was named the "Colorado Springs Pocket"; it was located July 13th and produced approximately 90 specimens of fair quality. The pocket was mostly collapsed, and even though the crystals were somewhat etched (probably by meteoric water percolating through the vein), some were nonetheless very large, being as much as 2 inches by 4 inches in size.

The third pocket, found in the third crosscut in mid-August, was appropriately named the "Museum Vug" because although rhodochrosite was sparse (mostly quartz-coated tetrahedrite was found) the one outstanding crystal recovered measured 3 inches on edge; it was on display at the Denver Show, and needless to say, it attracted a lot of attention. This pocket led to the discovery of the "Rainbow Vug", the best pocket found as of early September. This vug, discovered August 21st, was located at the vein flexure, and contained the largest rhodochrosite crystal found to date; it measured 4-1/2 inches on edge and weighed 5-1/2 pounds! Overall dimensions of the pocket were 6-1/2 feet deep and 1-to-4 inches in width.

Collecting mishaps do occur, in spite of all the precautions and best intentions. One vug, named the "Bad Luck Pocket" (located shortly after the Cash Flow Pocket) was situated such that the hydraulic splitter could not be used. Consequently, holes were drilled next to it in hopes of blasting a channel next to the opening. Unforeseen, however, was a gouge fault near the back of the vug. The shot consequently blew through the pocket and disintegrated much of it, although nice bright red, lustrous rhombs to 1 inch were recovered.

All in all, the 1992 season produced roughly 700 pieces, of which 450-500 were rhodochrosite, and all of which were sold at the Denver Show. Of this total, half were "wholesale" quality; only 25-to-30 top specimen-quality rhodochrosites were found, and these were quickly bought at the show, indicating a pent-up demand for such material.

The sale of these specimens was done in as orderly a manner as possible, and even so, the zeal in getting to the "rhodochrosite room" exceeded anything ever seen in Tucson, and maybe even the 19th Century Oklahoma land rush! Bryan Lees, in an effort to give everyone a chance to own a specimen, opted for a ticket-lottery system, where those entering the show were given a number that was coded to an entry time. The stay in the room was limited to 20 minutes, and purchased specimens were requested to be left on display so everyone could view them. Even so, there was a thriving black market in tickets, with stories of tickets being sold for \$10.00 or more just to get into the room earlier, and for good reason, because most or all of the good specimens were sold before 10:00 the first morning!

Another major pocket was found following the Denver Show and will be available at the Tucson Show in February. Bryan Lees will also give a talk about his mining venture at the Sweet Home mine on Saturday afternoon at the main show.



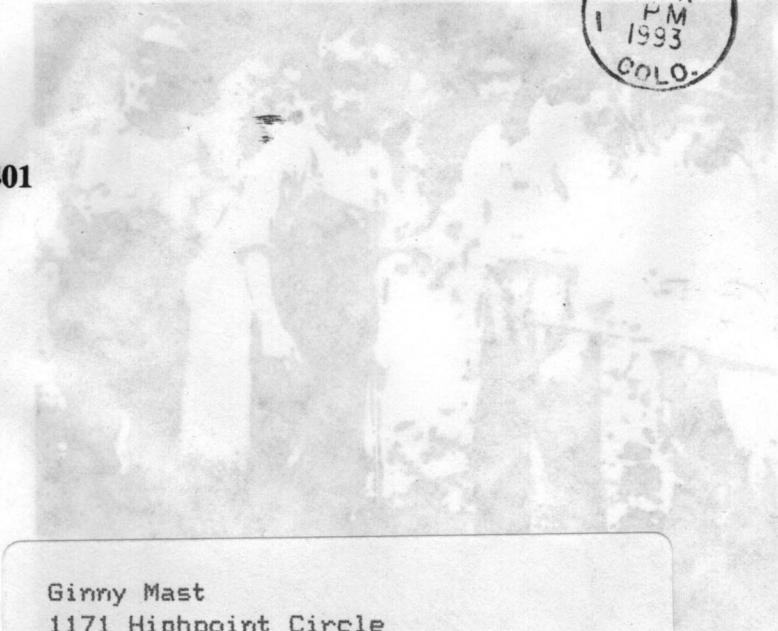
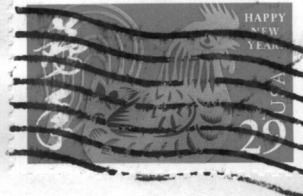
"Things better git finished on the update or someone's goin' to git shot"

1993 Calendar

- Jan. 14 - - January FM meeting, Ricketson Auditorium**
- Jan. 14-17 Denver Gem and Mineral Guild Show, Lakeside Mall**
- Feb. 11-14 Tucson Gem and Mineral Show**
- Feb. 13 - - FM-MSA Symposium, "Garnet", at the Tucson Show**
- Mar. 11 - - March FM meeting, VIP Conference Room**
- April 8 - - April FM meeting, Ricketson Auditorium**
- May 13 - - May FM meeting (annual auction)**
- Sep. 9 - - September FM meeting, Ricketson Auditorium**
- Sep. 16-19 Denver Gem and Mineral Show/American Federation Show**
- Oct. 14 - - October FM meeting, Ricketson Auditorium**
- Nov. 11 - - November FM meeting, Ricketson Auditorium**

 * *FM dues for 1993, \$13.00, are due and payable now.* *
 * *They are delinquent after March 1 and a list of* *
 * *1993 members will be sent to National FM on that date.* *
 * *Please send us your 1993 dues now. Thank you!* *

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