

FRIENDS OF MINERALOGY - COLORADO CHAPTER

Newsletter: June, 1978
Editor: Dub Crook

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Once again it is time for the Chapter Newsletter and I am sitting here with not a single response from any of the members. One does not have to hold a Ph.D. in crystal chemistry to contribute an article or a comment. There is a large variety of talent in the Colorado Chapter, varying from lapidary expertise to crystal structures, but I'd never know it from the response I've received. Unless you wish to see the newsletter die, please take the time and contribute an article, story, idea, etc. I will not let this newsletter become a monologue like the Pennsylvania Chapter's letter, so unless I can see some active participation from the chapter, do not look for the newsletter to continue. The next newsletter is scheduled for late October. Deadline for submitted material is October 20. All material should be mailed to:

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Chapter News

The July 13th meeting has been cancelled and replaced by a chapter field trip. The trip will be made to the Calumet Iron Mine near Salida. Date of the trip is Saturday, August 5. Rick Collins will lead the trip to the mine; assembly point will be at the mine dumps on the road below the mine at 10:30 AM, August 5. A complete road log to the mine can be found in Richard Pearl's book, "Colorado Gem Trails and Mineral Guide", 1972 ed., pages 101-105 under the section on the Turrett District. Recommended field tools are a shovel, small pry bar, and a small sledge. If you need a ride or have extra space for a ride, please contact Steve Rose at 237-0557.

The next regularly scheduled meeting will be September 14, 7:30 PM at the Denver Museum of Natural History. The program will be announced at a later date.

The Colorado Minerals 1958-1978 project is still underway. Revised mineral data cards are now available from either Phoebe Hauff or Jack Murphy. To encourage the competition for the completion of more cards, Phoebe has offered a prize for the person who completes the most data cards. First prize is a specimen of pyrite from the Gilman Mine. A runner-up prize may be offered if the competition is close. So, rack your brains, remember those mineral localities, and fill out the data cards to help in the eventual revision of Bulletin 1114.

Treasurer's Report

As of June 15, 1978, the FMCC bank balance was \$641.20. This increase was due to membership dues. We have not received to date our tax except status, however, it is expected soon.

-Jim Nelson-Moore, Treasurer

Notes from the President

The Colorado Chapter of Friends of Mineralogy is about one year old now and we have a total membership of about 50. I feel that these people are some of the more talented and dedicated individuals in the mineralogical community in the Front Range Colorado area. I am impressed with the fact that the group is a blend of professionals, amateur and advanced mineral collectors. This is an ideal mixture of people who can communicate to each other on a variety of different experiences.

The Chapter is still getting started and there is much left to do. It has taken quite a while to develop our legal foundation including the Articles of Incorporation and Bylaws. There are still some operating procedures to define as well as completion of our tax except status. As the months go by, our main job as I see it is to become increasingly involved in Phoebe Hauff's work on the sequel to the U.S.G.S. Bulletin 1114. This is some of the finest work we can do and I hope that the members will become seriously involved in this important project. We also need to get more involved with field trips and collecting projects when appropriate and I would also like to see a greater degree of participation with people volunteering to assist with such things as the Newsletter, in mailing and helping with mineral shows and other Chapter functions. The main business coming up this fall will be the Denver Council Show, which is September 8th through 10th. We need to firm up our plans on the appraisal function and the FM,CC display.

I would like to remind members that the July meeting has been cancelled in lieu of a field trip to the Calumet Iron Mine and the next official meeting for the Chapter is not until September 14th after the Denver Council Show. I will be calling on some individuals in the membership to help out.

-Jack Murphy, President

Misc. News

One of the largest blue topaz cut stones is presently on exhibit in Denver. The gem, weighing 2,165 carats, is the property of James Stradley of Stradley Lapidary Co., 430 16th Street. The gem is on display in his Empire Building shop along with two smaller Brazilian topaz gems (745 carats, 496 carats). Estimated value of the large stone is \$151,550.

May Program: "Gemology and Current Problems" by John Hoover

John gave us a brief look at the scientific aspects as well as the more aesthetic side to gemology. Tools used for the characterization of gemstones, such as the dichroscope, refractometer, and the diamond-scope were discussed in detail. The talk and the beautiful accompanying slides showed some of the complex but every-day problems of the gemologist.

Since the chapter newsletter began in April, several of the preceding meeting's talks were not given a review. Thus the January program of Gene Foord's talk on the Pala district of California will be included here.

January Program: "Mineralogy and Petrogenesis of Layered-Aplite Dikes in the Mesa Grande District, San Diego County, California" by Eugene Foord

The Himalaya pegmatite-aplite dike system, in the Mesa Grande district of San Diego County, California, is world-famous for its past yield of gem-quality tourmaline and mineral specimens of exceptional value. It is also of special interest as a complex product of crystallization in a system comprising silicate melt and aqueous vapor.

Two major dikes, with a combined thickness of about five feet and an exposed length of nearly 1.5 miles, trend north-northeast and dip westward at moderate angles. Three major rock units are present in each dike; a footwall pegmatitic aplite overlain by layered aplite and pegmatitic aplite, a hangingwall graphic pegmatitic unit, and a centrally disposed unit of "pocket" pegmatite. In general the dikes are separated by country-rock norite, but at several places one of them intrudes the other or they join to form a single complex dike.

Properties and compositional zoning were determined in detail for major and minor minerals of each rock unit, with much use of electron microprobe techniques. The major minerals include feldspars, garnets, micas, and tourmaline, and the minor minerals Nb-Ta oxides, apatite, spinel, and several rare species. A crystal structure refinement was completed for manganocolumbite. One new mineral species, rynersonite (calcium tantalate), was recognized and described in detail.

Among the tourmalines, schorl is widely distributed through both pegmatite and aplite, and elbaite occurs in central parts of the dikes within quartz-rich pegmatite and associated cavities, or "pockets" that commonly are filled with clay minerals. Much of the elbaite projects into the cavities as singly terminated color-zoned crystals, some of which are extensions of schorl crystals formed earlier in void-free pegmatite. Elbaite also occurs within the cavities as doubly terminated individuals with pencil-like form.

The typical sequence of development in singly terminated crystals with color zoning is blue→blue green→green→yellow→colorless→pink, which mirror non-uniform but progressive decreases in Fe content and increases in Mn content. Nearly all these crystals are closely fractured as if by thermal shock, and some are found as separated fragments that presumably reflect violent rupture of the containing cavities. Continued development of elbaite following these disturbances is indicated by clear overgrowths on crystal faces and fracture surfaces, and by the correlative occurrence of doubly terminated crystals scattered within the cavities. Many of these late crystals are color-zoned in shades of green, yellow, and pink, reflecting the slight compositional differences whose distribution may have been controlled in part by the pyroelectric and/or piezoelectric properties of the tourmaline.

The paragenetic sequence of other pocket minerals can be correlated with that determined from detailed studies of the tourmaline.

K/Ar and fission-track ages obtained for pegmatite pocket minerals and biotite of the host norite are concordant at 98 ± 3 My, and they are interpreted to represent the crystallization age of the dike system.

Studies of three types of fluid inclusions indicate low salinities in general less than five wt. percent equivalent NaCl for the aqueous fluid that existed during pocket formation. Filling and/or homogenization temperatures ranging from 330°C to 270°C probably correspond to temperatures that existed during later development of pocket minerals.

The genetic model here favored for the dike system involves initial emplacement, at a depth not greater than 6 Km, of silicate melt with lesser fractions of coexisting crystals and aqueous vapor. Crystallization of non-layered aplite and the overlying layered aplite sequence was mainly from the melt. Vapor played an important role in formation of the hangingwall graphic pegmatite, some of which crystallized simultaneously with the layered aplite and some of which was probably formed later. The pocket pegmatite represents subsequent interactions of crystalline silicates and an aqueous vapor phase. Pocket zeolites and secondary minerals were formed still later from hydrothermal solutions at lower temperatures and pressures. Pocket clay finally was developed under open-system conditions.

Recent Publications & Discoveries by Chapter Members:

Wilson W. Crook, III published the description of albrittonite, $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$, a new mineral from Llano County, Texas in the March-April issue of the American Mineralogist.

Eugene E. Foord published a paper describing the optical properties of several unusual minerals. The article appeared in the March-April issue of the American Mineralogist.

Phoebe Hauff and Eugene E. Foord have recently had a new mineral called hashemite approved by the IMA Commission on New Minerals and Mineral Names. The mineral occurs in Jordan and the name was selected by King Hussein after his country, the Hashemite Kingdom of Jordan. The chemical formula is $\text{Ba}(\text{Cr},\text{S})\text{O}_4$; crystal system = orthorhombic; color = dark brown. Hashemite is associated with Cr-bearing ettringite. The full description of the mineral will be published in early 1979.