

FRIENDS OF MINERALOGY

Pennsylvania Chapter

NEWSLETTER

Vol. 8, no. 2, June, 1980

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CHAIRMAN'S MESSAGE

Dear Fellow Members,

I am very pleased and happy to be able to announce that the final payment has been made on the book loan from the Friends of Mineralogy to the Pennsylvania Chapter. Thomas O'Neil, treasurer, reports a balance of \$1112.50 in our treasury, as of June 1.

The fourth printing (1973) of Samuel Gordon's Mineralogy of Pennsylvania is entirely sold out, while only a few copies remain of the reprint of William Jefferis' hand-written 1854 work, Mineralogy of Chester County.

The 8th Fall Symposium will be held on October 31 and November 1 and 2. Details will be announced in the September issue of the Newsletter.

Have a good summer. Happy hunting!

Sincerely,

Bryon Brookmyer

EDITOR'S NOTE

Remember that the members of F.M. are the reporters for this Newsletter! How about writing up your favorite local spot for the information of members in other areas of our state? Or how about a road log for a day trip or a weekend in your area? Have you investigated any Gordon localities lately, visited an interesting collection, or had a chat with one of our old time collectors? Informal collecting notes and articles are needed to balance the interesting scientific work which has been coming in thick and fast. Please send your short notes to Martin Anné and your articles to the editor. Thanks!

Juliet C. Reed

DUES

If you have not already done so, please send your 1980 dues to Vincent Matula, R.D. #4, Allentown, PA 18103. New members will receive back issues of the Newsletter for 1980

NEW MEMBERS

Dr. L. Walls
Albert Van Dyckstrat #9
2300
Turonhout, Belgium

Mrs. Jean Lawler
c/o Department of Geology
Bryn Mawr College
Bryn Mawr, PA 19010

NOTICE

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CARNEGIE MUSEUM

Included with this issue is an article from the Carnegie Magazine, by Delbert Oswald, Associate Curator of the Mineral Section of the Carnegie Museum of Natural History, Pittsburgh. Del, president of the Friends of Mineralogy, writes that he and Dorothy trimmed these extra pages (courtesy of the printer and editor), for the Newsletter. If all goes well, according to Del, the new Hillman Hall of Gems and Minerals will be opening for the general public on the 17th of September.

WHAT'S NEW IN PENNSYLVANIA MINERALS

I have nothing to report this month because no one is letting me know what is being found. I'm sure there is some activity, but where? let me know, please!

Martin Anné, 509 Maple St. Wrightsville, PA 17368

P.S. If I don't hear from you, the members, this will be my last article on "What's New in Pennsylvania Minerals."

GLOSSARY OF MINERAL SPECIES 1980

The new Glossary, successor to the second edition of 1975, is still at the printer's, according to a spokesman for The Mineralogical Record, in which the publication was recently announced. However, you may send your order (a wholesale discount is available to dealers only), at \$6.00 per volume, to Glossary, Min. Record, P.O. Box 35565, Tucson, Arizona 85740.

OCT. 31, NOV. 1, NOV. 2, 1980

What are these dates? The Fall Symposium! Why now? Frankly, because we need your help. Every year I look around and am disappointed that I don't see you. Many of the people attending the Symposium are from out-of-state. You must think that this is a function for which you do not want to spend \$18.00. Yes, \$18, including the banquet. "Why so high?" It used to be only \$5.00, excluding a banquet. Gas used to be only 30¢ a gallon. It costs money to put on this kind of function. You wanted refreshments. You wanted different speakers. You wanted a banquet, so why don't you support it? Maybe there's something we're not doing right. "O.K." Let us know what you have in mind. What would make you want to attend?

We have given away tables of minerals (you can get your money back here, just try buying minerals lately). We have refreshments, worth at least several dollars (eat out lately?). We have an auction (some good buys here). We have speakers to help you learn (you pay for schooling). You pay \$5.00 for a movie, \$30.00 for a football game or other entertainment. I can't believe money is the problem.

We have a policy of reduced rates (\$2.50 for students, 6-21 years of age, \$2.50 for senior citizens, over 60), so that leaves only those of us between 21 and 60 who have to pay full price, this year \$8.00 for one to three days. Hopefully, we can charge \$10.00 for the banquet (last year the charge was \$8.00 and the cost, \$8.50). If money is a problem for you, don't let this stop you, just write explaining your problem, and you can enter free. For those of you who have never attended, I feel that you are missing a good function, and an event you will always remember.

The Fall Symposium is not only for F.M. members, but for anyone interested in minerals. Invite all your mineral collecting friends!

Now that I've said what I feel is important, please write to me about your ideas.

Martin Anné, 509 Maple St., Wrightsville, PA 17368

MINERALOGICAL RECORD

J. Penrose Ambler, former F.M. Pa. Chapter Newsletter editor, is the author of an article on "A Farewell to Cornwall," in the March-April issue of the Mineralogical Record, concerning last spring's memorable Symposium.

PENNSYLVANIA NEWS FROM COLORADO

A letter was received recently from Phoebe L. Hauff and Allen V. Heyl of the U.S. Geological Survey in Denver on the occurrence of corrensite from the Kibblehouse Quarry, Perkiomenville, Montgomery County, Pa. A new mineral for the state, corrensite, a relative of smectite and chlorite, swells and deflates upon heating. Phoebe Hauff, who identified corrensite from Kibblehouse on samples provided by Allen Heyl as early as 1973, has just submitted a major monography on the mineral to a journal on clay mineralogy. The Kibblehouse material, says Dr. Heyl, is probably the best crystallized found anywhere to date. The habit is notably like that of stilbite, but the color is blackish-gray. He goes on to say that much of the corrensite still in his possession is sitting on nontronite, a waxy olive-gray dense clay mineral, which in turn sits on orthorhombic stellerite, or near stellerite.

Dr. Heyl has enclosed identification data (on file at Bryn Mawr College, c/o Dr. Maria L. Crawford, Curator) on corrensite, bertrandite, mottramite, and ankerite, in letters to the editor which will appear in the Newsletter. He has also written about the story of stellerite, once known from Kibblehouse Quarry as "epidesmine," a variety of stilbite. Two Italian mineralogists identified this new mineral for Pennsylvania and published on it (in English) in a European journal. The letter on bertrandite follows.

Evergreen, Colorado

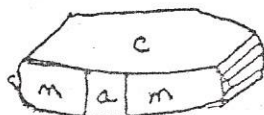
Dear Juliet,

Many years ago, I purchased a beryl crystal from Peter Zodac, founder and former editor of Rocks and Minerals. I bought a number of specimens from him, including part of the Jandorf York County collection, and others from all over the East. They were always carefully and correctly labeled, as far as I could tell.

This particular beryl is about 5 inches long and about 1 inch in diameter, and is labeled "Fairmount Park, Philadelphia, Pa." The specimen is particularly unattractive, because its color ranges from earth-brown to olive-green. There are several indentations of the ends of muscovite books, now detached, in the sides, and many small grains of albite and flakes of muscovite attached to the crystals of beryl. Although labeled in Zodac's own handwriting, the specimen is unattractive enough that several times through the years I had thoughts of tossing it away, or giving it to some beginning collector. Fortunately, it seems, I never did this. It looks as though it was found in loose top soil, or in rotten, weathered pegmatite.

One of the United States' best descriptive mineralogists, John ("Jack") W. Adams, works here on Denver. He is a charter member, as I am, of the Friends of Mineralogy, having been asked to join by his good friend, one of F.M.'s co-founders, Dr. Arthur Montgomery. Jack is now an active member of the Colorado Chapter of F.M. He grew up on Maine pegmatites in the summers, and was long an active member of the U.S. Geological Survey's pegmatite programs in the East, Colorado, and the Black Hills. Now he's known as one of the world's most knowledgeable mineralogists on beryllium and rare earth minerals. At lunch some time ago, he mentioned that the place to look for bertrandite $(\text{Be}_4\text{OH})_2\text{Si}_2\text{O}_7$, and some other rare beryllium minerals is in the pockets and irregularities of altered beryl crystals.

One evening, not long ago, I remembered my ugly beryl and examined it. I noticed that one termination was fresh, but the other was altered and pitted with many micropits. In some of these, were a few minute tabular colorless clear crystals. Their general habit is shown in the diagram below.



There are very few crystals, and they are very small. They did, however, look like bertrandite, as I remember seeing it from St. Peter's Dome, Colorado (near Pike's Peak), Hick's Dome, Illinois, Lake George, Colorado, and the Bigger Mine, Jefferson County, Colorado.

I took the beryl in and showed it to Jack Adams. He looked at the little crystals under his microscope and said, "It is almost certainly bertrandite." Jack could do no more at the time, as he had to get back to his job, studying uranium minerals in pegmatites. I went back to our building, and obtained the help of Eugene Foord, a transplanted Pennsylvanian, now the President of the F.M. Colorado Chapter.

The physical properties we determined on the micro-tabular crystals are as follows.

1. The mineral is biaxial negative.
2. The mineral has parallel extinction, which distinguishes it from herderite, the next most probable mineral with similar indices. The crystals are orthorhombic.
3. The indices are: n_x 1.59, n_y 1.60, and n_z 1.61.
4. $n_z - n_x$ is 0.24
5. The $2V$ is high, about 70° , and the mineral is optically - (negative).
6. The hardness is about 6.
7. The crystals are hemimorphic. They are modified on the corners, and have small and large prisms on the sides and on the ends, but pinacoids are the main faces. There are small pyramidal faces at the corners.
8. The mineral is colorless and transparent, with a pearly luster on the pinacoids. The tabular crystals are essentially equant. -
9. Gene Foord analysed a crystal on the scanning electron microscope and found only silica (beryllium cannot be determined on the S.E.M.). There was no calcium or phosphorous, however, which eliminated herderite.
10. The amount available is too small for an X-ray pattern.

I looked up Fairmount Park in Gordon, and found on page 232 that altered beryl crystals are reported in a quarry and bluff on the south side of Lansdowne Ravine, facing the Pennsylvania and Reading Railroad. It says that the best specimens were found in the soil, which fits my old crystal specimen.

Altered beryl is also reported in the bluffs on the west side of the Schuylkill River, north Spring Garden Bridge, opposite the "old" Fairmount Waterworks. A footnote states that a number of quarries used to occupy this site, but that the entire area is now occupied by the Pennsylvania Railroad (Conrail).

Beryl was also reported from the bluffs along West River Drive, above the Girard Avenue Bridge, and along the East River Drive, while the East River Drive Tunnel and the hill above were being excavated. Beryl with bertrandite could have been found at any of these localities. I would suggest that any old specimens from this area be examined for bertrandite, especially if altered. Of course, if any new excavations are made in the area, they should be examined closely, especially if in or near pegmatites.

With all good wishes,

Sincerely yours,

Allen V. Heyl

Editor's Note: Dr. David Hess is a mineralogist who began his collecting in Pennsylvania quarries as he grew up in Doylestown. You may remember his articles in the Mineralogical Society of Pennsylvania Newsletter as his geological studies progressed. Dr. Hess writes that he has just enjoyed a busy semester at Indiana University, where he is involved in teaching and research. Below are parts one and two of a progress report on his recent Pennsylvania mineralogical research. Part three, on an amphibole from York County, and part four, on the cummingtonite problem, will appear in a later Newsletter.

Bloomington, Indiana, May, 1980

Part One

I have obtained definitive optical and X-ray diffraction data on both andalusite and kyanite pseudo-andalusite from Delaware County, Pennsylvania. More detailed data will be presented later elsewhere, as I am still awaiting thin sections for textural and fabric observations, and hope to synthesize my data with some geological interpretation.

The andalusite is a Ward's Natural Science Establishment, Inc., specimen, labeled "Delaware County, Pennsylvania." It is maroon-pink in color and is bounded by simple {001}, {010}, and {100} pinacoidal forms, and coated with plates of mica. X-ray diffraction study indicates this mica to be paragonite, but additional data are needed. X-ray diffraction data also indicates a trace of kyanite in the specimen. An analysis by Mark S. Gilstrap of the Indiana State Geological Survey, by ICP (Inductively Coupled Argon Plasma Spectrometer) indicates (with $\pm 1.0\%$ error), $\text{Fe}_2\text{O}_3 = 0.311\%$, $\text{MgO} = 0.052\%$, $\text{MnO}_2 = 0.008\%$ (U.S.G.S. standard peridotite PCC-1 and granite G-1 standards were used for analysis).

The kyanite pseudomorph after andalusite was purchased from Carousel Gems and Minerals (Muth Collection) and is labeled as coming from north of Media, Delaware County, Pennsylvania. It is dark blue-gray in color, and under oils is seen to consist of very warped prisms and fibers, with zoned undulatory extinction. Original forms include {100}, {100}, and {010} as pinacoids, and on a few crystals {110}, and {111}. These latter are generally developed on only one or two sites for an oddly low-symmetrical geometry (noted also by Dike in his 1951 study presented in the American Journal of Science and by Genth in 1875 (Preliminary Report on the Mineralogy of Pennsylvania, Second Geol. Surv. Penn., Rep. B2, 1876)).

My personal interpretation, based on studies and the literature, is a series of transformations passing from andalusite to sillimanite and then to kyanite, with much directed stress on the sillimanite and kyanite stages, causing warping. Muscovite and iron-rich chlorite are associated with the kyanite, according to X-ray diffraction data and observations in refractive index oils. It is obvious that kyanite pseudo-andalusite (and probably sillimanite!) is much more abundant in Delaware County than less-altered or unaltered andalusite. However, as indicated also by Dr. Allen V. Heyl (F.M., Pa. Chapter, Newsletter, vol. 7, no 3 and 4, Fall and Winter, 1979), some unaltered andalusite does occur.

Part Two

In January, 1979, Martin Anné gave me a specimen from Wood's Chrome Mine of a deep green "genthite"-like coating on chromite.

Last spring I obtained some X-ray diffraction data which indicated a nickel-ian clinochrysotile (pecoraite end member) structure, but a few peaks are very slightly offset, and I attributed this in part (aside from experimental error) to probably substitution of MgO for NiO in the unit cell structure. The mineral is light emerald-green to chartreuse, with some slightly brown, more iron-rich layers. Under high power, a layered to looped, concentric-layered (colloform)

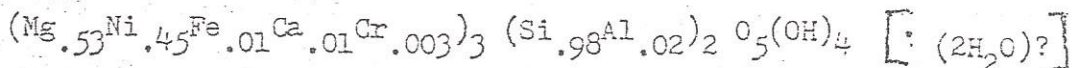
structure is evident, with fan-like undulatory extinction.

Indices are variable, but approximate values are (corrected from 26.5°C): $\alpha = 1.545$; $\beta = 1.556$; $\gamma = 1.567$. The 2V is high, and the birefringence is moderate. The material, though pure, is somewhat inhomogeneous optically and compositionally. The peaks, although distinct, are broad, and this X-ray diffraction observation may result from a combination of the high nickel content, inhomogeneity, and the presence of possible waters of hydration.

ICP analysis (Inductively Coupled Argon Plasma Spectrometer) and water analysis by Paul Lechler and Patty Landis of the Indiana State Geological Survey, using peridotite PCC-1 as U.S.G.S. standard, give the following results (these are compared with those of Genth for "genthite" (Gordon, 1922, p. 124) and those of Faust, Fahey, and Mason (Science, vol. 165, no. 3888, p. 59-60, 1969) for pecoraite or nearly pure nickelian clinochrysotile).

<u>Nickelian Clinochrysotile</u>		<u>"Genthite"</u>	<u>Pecoraite</u>
(Wood's Mine, Lancaster Co.)		(Wood's Mine)	(Wolf Creek Meteorite, Australia)
SiO ₂	37.1 %	35.36 %	31.0 %
NiO	30.0	30.64	51.5
FeO	0.55	0.24	0.70
MgO	18.6	14.60	0.50
Al ₂ O ₃	0.70	N.D.	1.40
CaO	0.46	0.26	0.40
Cr ₂ O ₃	0.40	N.D.	N.D.
H ₂ O +	8.39	19.09 (total H ₂ O)	9.70
H ₂ O -	4.72		4.10
	13.11 total H ₂ O		13.80 total H ₂ O
Total	100.91 %	100.19 %	99.3 %

The calculated formula for the Lechler-Landis Wood's Mine analysis is:



It is apparent from Genth's analysis above that either magnesium is low or total water may be high, or both. However, the excess water in Genth's analysis may be real, and reflect the waters of hydration possibly present.

Unfortunately, the H₂O cannot reflect whether this is loose, adsorbed water or actual inter-layer waters of hydration. If it is the latter case, then the formula for the 1980 analysis of the Wood's Mine sample should include two waters of hydration. Faust, Fahey, and Mason (1969) did not add waters of hydration, but their H₂O- and H₂O + is close to our analysis. Genth believed waters of hydration to be present in his analysis of Wood's Mine material. Perhaps the increased nickel content, and resulting structural dislocation (i.e., bending) requires some interlayer waters to be present.

Until this question is settled, it is best from the X-ray structure, optics, and chemical analysis to call the Wood's Mine material analyzed here nickelian clinochrysotile, as it does not quite make the 50-50 cutoff for pecoraite. Undoubtedly, some material (and possibly Genth's sample) would cross this borderline.

David Hess

Indiana University