

FRIENDS OF MINERALOGY

Pennsylvania Chapter

NEWSLETTER

Vol. 13, No. 1, Spring, 1985

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PRESIDENT'S MESSAGE

Greetings! This March weekend is the first one of the year that I have not had to spend studying, writing or otherwise engaging in school-related activities. During January and February, I survived two midterms, one term paper, the beginning of a second paper, and the oral examination for my Master's degree from West Chester State University (keep in mind that I am employed full time as well). This month my wife will be giving birth to our second child!

All of the above is not to say that things have stopped moving with the Pennsylvania Chapter. The Spring Meeting is well into the late planning stages. Ed Carper and Pen Ambler are co-chairmen of the Conference on the "Basic Geology and Mineral Collecting of Blair, Huntingdon and Bedford Counties," May 18-19, 1985. Jay Lininger will work up the history of the localities and provide us with a Conference publication. A flyer will be sent to the membership and area clubs as soon as final plans are made. Work on the Fall Symposium, November 6, 9, and 10 at West Chester, is also underway. Remember that your help for these meetings is not only welcome, but necessary. Just let me know.

Below are some goals which I've set for the Chapter this year.

(1) Update the speaker, dealer, and museum lists by the Fall Symposium (a suggestion from Martin Anne).

(2) Begin computerizing our membership list. One thing which could be done would be for all members to fill out a questionnaire which contained information which might be of interest to other members (e.g., size of specimens collected, specialties). This information could be printed by the computer, copied onto loose-leaf paper, and distributed so that all members would have information about each other's interests, trading material, etc. As is the custom with the International Thumbnail Collectors' group, any new member could be sent the sheets on all the members, with the option of buying a notebook with our logo printed on it. Once the information has been entered into the computer file, updating it becomes very easy. The system could also be used to keep track of dues, etc. What is needed is a computer-wise person out there who would volunteer to participate in such an endeavor. Volunteers, please call me, or I'll start contacting those of you whom I know have personal computers and computer savvy.

(3) As Marty Anne also suggested, let's get preliminary planning started for a new mineralogy of Pennsylvania. This issue is complex, sometimes emotionally charged, and requires a lot of input from a lot of people. However, now is a good time to begin.

In addition to the ideas I've mentioned above, Tom O'Neil, our Treasurer, has suggested that our By-Laws be updated. This will be discussed at the Board of Directors meeting to be held during the Spring Conference.. Anyone with ideas or suggestions should contact

PRESIDENT'S MESSAGE (cont'd)

me. The Board meeting will be held on Sunday, May 19, as I will be receiving my M.S. on Saturday, and so will not be able to be at the Conference that day.

Buy, read, and use a good mineralogy or geology book (try Gem and Crystal Treasures by Peter Bancroft, one of the Mineralogical Record publications, or Economic Mineral Deposits by Jensen and Bateman).

George Buchanan

(215)-723-0727

MEMBERSHIP INFORMATION

Dues: Send \$7.00 (\$4.00 for members over 62) for 1985 dues to F.M., Pa. Chapter, c/o Marge and Vince Matula, 2110 Weaversville Rd., Allentown, PA 18103.

New Members: Richard Remig, 7575 Violet Circle, A.O.W., Macungie, PA 18062.

Joseph Meloney, R.D. #2, Box 97-2, Huneybrook, PA 19344.

Address Change: Richard Meckley, Apt. 701, Gloria Dei Towers, 770 Welsh Rd., Huntingdon Valley, PA 19006.

Officers: George Buchanan, 80 Beltz Rd., Telford, PA 18969, President
Jay Lininger, R.D. #3, Ridge Rd., Dillsburg, PA 17019, Vice President
Thomas O'Neil, 1000 Tule St., Montoursville, PA 17754, Treasurer

Editor: Juliet C. Reed, 336 Rockland Rd., Wayne, PA 19087

NOTES AND NEWSBerks County, PA. Barite Occurrences

The Mineral Resource Division of the Pennsylvania Geological Survey has completed a reconnaissance investigation of barite occurrences in eastern Pennsylvania. Reconnaissance float mapping of a six-square mile portion of the Bethel 7½-minute Quadrangle has resulted in the identification and description of eleven fetid barite occurrences in western Berks County. Host rock relationships and interpretations of paragenesis, age, and environments of deposition are offered in Fetid Barite Occurrences, Western Berks County, Pennsylvania, which is available from the State Book Store, P.O. Box 1365, Harrisburg, PA 17105. With the order, enclose a check for \$5.50 (plus 33¢ Pa. tax for residents), payable to the "Commonwealth of Pennsylvania".

New Mineralogical Record Index

A cross-referenced index of the first fourteen years of The Mineralogical Record magazine has recently been compiled and published by The Friends of Mineralogy. Authors, localities, minerals, subjects, photographs, etc., are covered in a very useful paperback volume. The book may be ordered from The Mineralogical Record Book Department, P.O. Box 1656, Carson City, NV 89702. (\$18.00, ppd.).

Friends of Mineralogy Pennsylvania Chapter Inc

Annual Financial Report
February 1 1984 through January 31 1985

Balance February 1 1984 1635.43

Income

Dues	499.00	
Sale of Publications	256.60	
Interest on savings account	66.54	
Symposium and banquet registrations	578.00	
Mineral auction	489.75	1889.89

Expenditures

Dues (National)	245.00	
Postage	85.00	
Sales tax on publications	26.21	
Donation (MR Index)	100.00	
Newsletter expense	232.87	
Printing	371.65	
Symposium expense	589.35	1650.08

Balance January 31 1985 1875.24

Williamsport National Bank	Checking account	570.43	
	Savings account	1304.81	1875.24

Grant Fund

Balance February 1 1984 2018.17

Income

Interest	109.52	
Donations	10.00	119.52

Balance January 31 1985 2137.69

Williamsport National Bank Memorial Grant Fund 2137.69

Thomas O'Neil

Thomas O'Neil, treasurer

February 1 1985

THE PENNSYLVANIA MINERAL LIST:
A Preliminary List
Of Additions and Changes. 1975-1985

Martin Anne has made a preliminary list of changes for the Pennsylvania mineral list, last published in a 1980 Pa. Chapter Fall Symposium program, but, dated 1975, more generally available in Mineralogy of Pennsylvania, 1966-1975, by Robert C. Smith, II (F.M., Pa. Chapter, 1979). Partial documentation is included with the list below. Readers are invited to provide further names (with references, please), for a complete, well-documented, 1975-1985 list of additions, deletions, and changes, in the style of Smith (1979, p. 3-9).

Awaruite	A.V. Heyl, <u>Mineralogical Record</u> .
Apophyllite	A Group name, for species see Fleischer's 1983 <u>Glossary</u> .
Beta-uranophane	Uranophane-beta, 1983 <u>Glossary</u>
Chalconatronite	P.c. from Dr. David Garske to M. Anne, concerning an Ecton Mine specimen.
Chalcophyllite	Pa. Geological Survey Min. Res. Rept. 80, Smith and Hoff, 1985, see article above).
Cuprosklowdowskite	Pa. Geological Survey Min. Res. Rept. 80, Smith and Hoff, 1985.
Cyanotrichite	P.c. from Vandall King to M. Anne, concerning an Ecton Mine specimen.
Hisingerite	P.c. from Dr. J. Alexander Speers to M. Anne concerning a Gap Mine specimen.
Dewindtite	Replaces Renardite, see <u>Glossary</u> , 1983.
Hisingerite	P.c. from Dr. J. Alexander Speers to M. Anne concerning a Gap Mine specimen.
Ferrihydrite	Wilson and Russell (1983, <u>Mineralogical Magazine</u> ((see Summer, 1985, <u>Newsletter</u>)).
Scolecite	A. V. Heyl, F.M., Pa. Chapter <u>Newsletter</u> .
Widenmannite	Pa. Geological Survey Min. Res. Rept 80, Smith and Hoff, 1985.

Martin Anne

509 Maple St.

Wrightsville, PA 17368

Editor's Note: The Pennsylvania Mineral List from the 1980 F.M., Pa. Chapter, Fall Symposium Program is re-printed on page 5. The program was compiled by Jay Lininger, but no credit is given for changes to the 1975 list included in Smith's Mineralogy of Pennsylvania, 1966-1975 (1979).

THE PENNSYLVANIA MINERAL LIST: 1980 Update⁽¹⁾

ACANTHITE
ACTINOLITE
ALBITE
ALLANITE
ALLOCLASITE
ALLOPHANE
ALMANDINE
ALUNITE
ALUNOGEN
ANALCIME
ANATASE
ANCYLITE
ANDALUSITE**
ANDERSONITE
ANDESINE
ANDRADITE
ANGLESITE
ANHYDRITE
ANKERITE**
ANORTHITE
ANTHOPHYLLITE
ANTIGORITE
APOPHYLLITE
ARAGONITE
ARSENOLITE*
ARSENOPYRITE
ARTINITE
AUGITE
AURICHALCITE
AUTUNITE
AZURITE
"BABINGTONITE"
BARARITE*
BARITE
BASTNAESITE
BERAUNITE
BERNDTITE*
BERTRANBITE**
BERYL
BETA-URANOPHANE
BIANCHITE
BILLIETITE
BIOTITE
BISMUTH**
BISMUTHINITE
BISMUTITE
BOEHMITE
BOLTWOODITE
BORNITE
BOUSSINGAULTITE*
BROCHANTITE
BROOKITE
BRUCITE
BYTOWNITE
CACOXENITE
CALCITE
CANCRINITE
CARBONATE-
FLUORAPATITE
CARNOTITE
CASSITERITE*
CELESTINE
CERUSSITE
CHABAZITE
CHALCANTHITE
CHALCOCITE
CHALCOPHYLLITE
CHALCOPYRITE
CHAMOSITE
CHERVETITE
CHEVKINITE
CHLORITOID
CHONDRODITE
CHROMITE
CHRYSOCOLLA
CHRYSOTILE
CLAUSTHALITE
CLINOCHLORE
CLINOHUMITE

*Nine Five Minerals

CLINOZOISITE
COBALTITE
COFFINITE
CONICALCITE
COPIAPITE
COPPER
CORDIERITE
CORKITE
CORNUBITE
CORRENSITE**
CORUNDUM
COVELLITE
CRANDALLITE
CRYPTOHALITE*
CRYPTOMELANE
CUPRITE
DATOLITE
DESAUTELSITE
DESCLOIZITE
DIASPORE
DICKITE
DIGENITE
DIOPSIDE
DIURLEITE
DOLOMITE
DOWNEYITE*
DRAVITE
DUMORTIERITE
ENARGITE
ENSTATITE
EPIDOTE
EPSOMITE
ERYTHRITE
FAYALITE
FERRIMOLYBDITE
FERROAXINITE
FERROCOLUMBITE
FLUORAPATITE
FLUORITE
FORSTERITE
FOURMARIERITE
FRANCEVILLITE
GAHNITE
GALENA
GERSDORFFITE
GIBBSITE
GISMONDINE
GLAUCONITE
GOETHITE
GOLD
GOSLARITE
GRAPHITE
GREENOCKITE
GROSSULAR
GYPSUM
HALITE
HALLOYSITE
HALOTRICHITE
HARMOTOME
HEAZLEWOODITE
HEDENBERGITE
HEMATITE
HEMIMORPHITE
HERZENBERGITE*
HEULANDITE
HEXAHYDRITE
HINSDALITE
HORNBLende
HUNTITE
HYALOPHANE
HYDROMAGNESITE
HYDROXYL-APATITE
HYDROZINCITE
HYPERSTHENE
IDAITE
"ILLITE"
ILMENITE
ILVAITE
JAROSITE

**NEW SINCE LAST PUBLISHED LIST

JORDANITE
KAOLINITE
KASOLITE
KIESERITE
KYANITE
LABRADORITE
LANGITE
LANCERDITE
LANTHANITE
LAUMONTITE
LEPIDOCROCITE
LIEBIGITE
LINARITE
LIZARDITE
MACKINAWITE
MAGNESIOCHROMITE
MAGNESITE
MAGNETITE
MALACHITE
MANGANAXINITE
MARCASITE
MARGARITE
MARIALITE
MASCAGNITE*
MATULAITE
MAUCHERITE**
MEIONITE
MELANTERITE
MESOLITE
META-AUTUNITE
METANOVAECITE
METATORBERNITE
METATUYAMUNITE
META-URANOCIRCITE
METAZEUNERITE
MICROCLINE
MILLERITE
MIMETITE
MOLYBDENITE
MOLYBDENITE-3R
MONAZITE
MONTMORILLONITE
MORENOSITE
MOTTRAMITE
MULLITE*
MUSCOVITE
MATROLITE
NEPHELINE
NESQUEHONITE
NONTRONITE
NSUTITE
OLIGOCLASE
OLIVENITE
OPAL
ORPIMENT*
ORTHOCLASE
OTTEMANNITE*
PALYGORSKITE
PARAGONITE
PECTOLITE
PENTLANDITE
PHILLIPSITE
PHLOGOPITE
PHOSPHURANYLITE
PICKERINGITE
PICROMERITE*
PIEMONITE
PIGEONITE
PLUMBOJAROSITE
POSNJAKITE
POTASH ALUM
POWELLITE
PREHNITE
PSEUDOMALACHITE
PUMPELLYITE
PYRITE
PYROAURITE
PYROLUSITE
PYROMORPHITE

PYROPE
PYROPHYLLITE
PYRRHOTITE
QUARTZ
REALGAR*
RENARDITE
RETERGERSITE
RIEBECKITE
ROCKBRIDGEITE
"ROSASITE-(MG)"
ROZENITE
RUTILE
SAFFLORITE
"SAFFLORITE-(FE)"
SALAMMONIAC*
SAUCONITE
SCHEELITE
SCHORL
SCHROECKINGERITE
SELENIUM*
SEPIOLITE
SERPIERITE
SIDERITE
SILLIMANITE
SILVER
SKLODOWSKITE
SKUTTERUDITE
SMITHSONITE
SPESSARTINE
SPHALERITE
SPINEL
STARKEYITE
STAUROLITE
STELLERITE
STILBITE
STILPNOMELANE
STRENGITE
STRONTIANITE
SULFUR
SUSANNITE
SYNGENITE*
TALC
TENNANTITE
TETRAHEDRITE
THAUMASITE
THENARDITE*
THOMSONITE
THORIANITE
THORITE
THOROGUMMITE
TITANITE
TOCHILINITE
TORBERNITE
TREMOLITE
TSCHERMIGITE*
TURQUOISE
TYROLITE
TUYAMUNITE
URANINITE
URANOPHANE
URANOSPINE
UVAROVITE
VANADINITE
VANDENDRIESSCHEITE
VARISCITE
VERMICULITE
VESUVIANITE
VIOLARITE
VIVIANITE
VOLTAITE*
WAVELLITE
WEEKSITE
WOLLASTONITE
WOLSENDORFITE
WULFENITE
WURTZITE
ZARATITE
ZIRCON
ZOISITE

(1) 1980 F.M., Pa. Chapter, Fall Symposium Program, "Minerals, Museums, and More."

OCCURRENCE AND PETROGENESIS OF RIEBECKITE
AT GLEN MILLS QUARRY, DELAWARE COUNTY, PA.: PART II

X-ray Powder Diffractometer Data

X-ray diffractometer patterns were run on Phillips-Norelco XRD-5 (Cu_K lines) at 1°2θ per minute. Major spacings for riebeckite follow in Table I (page 9) and for a chlorite group species in Table II. No studies were done on the stilbite, heulandite, pyrite, quartz, or calcite. Optics and X-ray data correlate with an Fe²⁺-rich riebeckite. Comparison with analyses in Chain Silicates, Vol. 2, Rock-Forming Minerals (Deer, Howie, and Zussman, 1963, p. 338-339) indicates Mg²⁺ content is probably less than 15% of the total Fe²⁺ Mg²⁺ mole percent. X-ray data and optics indicate the chlorite group mineral is probably about intermediate in Fe²⁺ Mg²⁺ content, but possibly slightly more iron-rich. Note the somewhat weaker 1st order basal spacing (001) in the X-ray diffraction spacings. Without detailed chemical analyses, this is as exact as possible from such measurements.

Paragenesis of Shear Zone Minerals

A chart showing the relative times of mineral deposition as evidenced from examination of specimens follows:

Albite	_____
Heulandite	_____
Stilbite	_____
Calcite	_____
Chlorite sp.	_____
Riebeckite	_____
Pyrite	_____

Most stilbite encrusts heulandite; some of the chlorite mineral is included in calcite, some encrusts it; riebeckite encrusts the chlorite; pyrite is later than calcite; and some pyrite is found on the chlorite.

The major shear zone is more altered in some places than in others: the hornblende gneiss changes from very hard to very friable, almost granular along its length. The majority of crystallized minerals occur along the edges of the shear, especially the zeolites.

Petrogenesis and Metamorphic Conditions

Alteration to sodic plagioclase, a chlorite species, and riebeckite occurred at the expense of green-brown hornblende and plagioclase in the gneiss. Noting approximate composition of phases, we can give a possible equation for observed reactants and products.

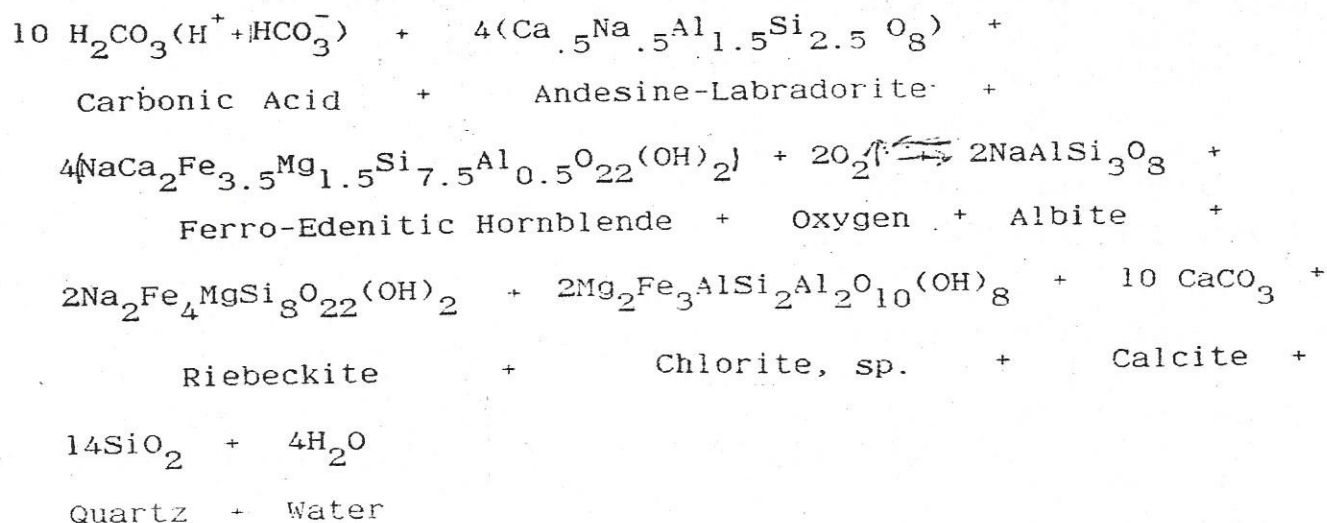
Although hornblende from Glen Mills Quarry gneisses has not been analyzed, Rosensweig and Watson (1954) found magnesio-hornblendes and edenitic hornblendes to be common in the southeastern Pennsylvania area under upper amphibolite and hornblende granulite metamorphic rank conditions. The other reactant, plagioclase, is chiefly andesine in hornblende gneisses and labradorite in the meta-dabase.

As already indicated, products include, at least, an Fe-rich riebeckite: a probably slightly Fe-rich chlorite mineral, and sodic plag-

OCCURRENCE AND PETROGENESIS OF RIEBECKITE AT
GLEN MILLS, DELAWARE COUNTY, PA.: PART II (cont'd)

ioclase. Calcite and quartz occur nearby in vein assemblages. Pyrite, huelandite, and stilbite are found elsewhere in the shear zone.

It is suggested that acid solutions containing H_2CO_3 (and possible H_2S or HSO_4^-) circulated along the shear zone, along with minor oxygen. A possible equation follows:



The amount of alumina should probably be a little greater in the hornblende (0.75-1.50 mole instead of 0.5 mole), therefore an unrecognized aluminous phase may have gone into the zeolites observed in other parts of the shear zone.

The reactants (hornblende and plagioclase) apparently equilibrated in the upper amphibolite facies, whereas the products are typical of the lower green-schist facies (hydrothermal quartz-albite-muscovite-chlorite sub-facies) of much lower temperature. Here, a chlorite species, quartz, and calcite can coexist. Riebeckite may have developed rather than actinolite because of the more sodic and ferrian nature of the solutions present and/or fluid pressure conditions. Ferro-actinolite of the same 4:1 Fe:Mg (or more) ratio as in riebeckite is rare and not very stable over a wide range of conditions.

Other hydrothermal reactions in more aluminous-rich gneisses or pegmatites may have produced the stilbite and heulandite observed at other places along the shear zone in the Glen Mills Quarry.

The age of the mineralization is uncertain. Most occurrences of riebeckite in Pennsylvania are limited to shears in Precambrian gneisses of the Reading Prong in Berks, Bucks, Lehigh, and Northampton Counties, but the exact age of this mineralization is not known. However, probable, but unconfirmed, blue fibrous riebeckite occurs in shear zones in Triassic diabase at Dyer Quarry, Gibraltar, Berks County (Geyer, et al, 1976). Thus riebeckite in the Reading Prong occurrences could be late Precambrian, Paleozoic, or Triassic in age, and that of Glen Mills Quarry either Paleozoic or Triassic in age.

OCCURRENCE AND PETROGENESIS OF RIEBECKITE AT
GLEN MILLS, DELAWARE COUNTY, PA.: PART II (cont'd)

Acknowledgements

We are very appreciative for observations made by Martin Anne on our field trip in December, 1982, and for information supplied by Juliet Reed and Bob Smith.

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Table I (page 9)

Table II (page 9)

David F. Hess, c/o Dept. of Geology, Western Illinois Univ.,
Macomb, Ill. 61455.

Bryon Brookmyer, #29, Ringneck Drive, Harrisburg, PA 17112.

Editor's Note: Thanks to David Hess for reminding an absent-minded editor that Part I of this article was published in March, 1984. New members who did not have a chance to read Part I may request a copy from the editor.

688-6180

OCCURRENCE AND PETROGENESIS OF RIEBECKITE AT
GLEN MILLS, DELAWARE COUNTY, PA.: PART II (cont'd)

X-ray Data

X-ray diffractometer powder patterns were run on a Phillips-Norelco XRD-5 (Cu_K lines) at 10 20 Per minute. The major spacings for riebeckite and the chlorite mineral follow:

Table I: Riebeckite

d-spacings	I/I ₀	hkl
9.205Å	2	020
8.38Å	5	110
8.315Å	10	110
3.645Å	9	221
3.277Å	16	240
3.138Å	43	310
3.135Å		
2.978Å	24	221
2.976Å		
2.807Å	11	330
2.744Å	15	151
2.739Å	18	331
2.552Å	8	202
2.327Å		
2.319Å	9	351, 421 171
2.312Å		
2.165Å	14	171, 261
2.164Å		
1.993Å	13	135
1.992Å		
1.629Å	14-15	11(1), 153
1.628Å		
1.562Å	15.5	402

Table II: Chlorite, sp. (1)

d-spacings	I/I ₀	hkl
14.13Å	3.5	001
7.098Å	7.	002
4.761Å	7.	003
4.746Å		
4.555Å	3.5	020
3.601Å	11.	004
3.571Å	12.	
2.812Å	16.5	005, 130, 201
2.811Å		
2.595Å	7	131, 202
2.593Å		
2.554Å	12	132, 201
2.001Å	10	135
2.000Å		
1.866Å	11	135
1.663Å	5.5	206
1.561Å	7	137, 226
1.558Å		

(1) Sodic plagioclase is indicated by X-ray diffraction peaks at 3.176Å.