FRIENDS OF MINERALOGY
Pennsylvania Chapter

NEWSLETTER

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PRESIDENT'S MESSAGE

I'll have news of the Tucson Show and the national F.M. meeting for the Spring, 1997, issue of the *Newsletter,* as well as a date for the fall Symposium, probably in early November, at West Chester State University (the theme will be "Carbonates").

Jay Lininger and Juliet Reed report that the Montgomery book is in the page-proof stage, so we will be able to send out discount pre-publication sale fliers fairly soon.

Regards to all.

Roland Bounds, President
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MEMBERSHIP INFORMATION

Dues

Remember that **1997 dues are now $15.00 (seniors and students, $10.00).** This issue of the *Newsletter* includes a notice for those who have not yet sent in their dues, according to the latest information which the editor has, as well as an opportunity to contribute to the Memorial Grant Fund. Membership cards are included for paid-up members who have not yet received them.

New Members

Marilyn Dodge, 71 Woodbury St., Providence, RI 02906-3570
Joyce M. Myers, 1615 E. Boot Rd., West Chester, PA 19380
Carole Sterling, 320 Summit Rd., Mountainside, NJ 07092
Irwin Baker, 7202 Ives Rd., Marcy, NY 13403

Address Changes

David Adam, 2116 E. First St., Tucson, AZ 85719
Joseph Dague, 1296 Boiling Spring Road, Chambersburg, PA 17201
Joseph Murter, 3646 Kingsman Rd., Dale City, VA 22193

Coming Events

Editor's Note: Our members now come from New England, as well as the states surrounding Pennsylvania (not to mention Arizona and Colorado). Notices of shows and other special events, as well as club newsletters, will be welcomed by the editor.

March 7, 8, and 9: Delaware Mineralogical Society Show at the Brandywine Terrace, 3416 Philadelphia Pike, Claymont, Delaware; call Donna Brown (610-255-5365).

March 8: Micromount '97, Rock and Mineral Club of Lower Bucks County Micromount Show; theme, "the Minerals of Maine;" 10 a.m. to 4 p.m. at the Fairless Hills Methodist Church; Dick Tillett, 215-785-2642, has more information.

March 22 and 23: Franklin Co. Rock and Mineral Club Show, Franklin Co. Vo-Tech, 2463 Loop Rd., Chambersburg, Pa.; 10 a.m to 7 p.m., March 22 and 10 a.m. to 5 p.m., March 23; contact Pat Hoyer, 6528 Mountain Drive, Chambersburg, Pa 17201-9055 (717-352-8548).

April 4-6: Atlantic Micromount Conference, University of Maryland, College Park, Md.

April 5 and 6: Philadelphia Mineralogical Mineral Treasures Show, "The Many Faces of Calcite," at the Schuylkill Valley Nature Center, 8480 Hagy's Mill Road, Philadelphia, Pa.; door open at 10 a.m..

April 12-13: York Rock and Mineral Club Mineral and Gem Show; Alert Fire Co., Emigsville, Pa.

June 7: Pennsylvania Earth Science Association Spring Mineralfest; 9 a.m. to 3 p.m., Macungie Memorial Park Building, Macungie, Pa.

June 21 and 22: The Berks Mineralogical Society Swap and Sell; 9 a.m. to 2 p.m., Appalachian Campsites, Shartlesville, Pa.; call Sue Gehret at 610-929-0332.

October 4: Pennsylvania Earth Science Association Autumn Mineralfest, 9 a.m. to 3 p.m., Macungie Memorial Park Building, Macungie, Pa.

Oct. 19-20 Mineralogical Society of Pennsylvania "Earth Treasures" Gem and Mineral Show: Solanco Fiargrounds, Quarryville, Lancaster Co., Pa.; Sat., 10 a.m. to 6 p.m. and Sunday, 10 a.m. to 5 p.m.

SOME MINERALS OF DELAWARE (AND OTHER TALES OF YESTERYEAR)

Your editor recently came across an old issue (vol. 11, no. 10, November, 1936), which would have cost you 15 cents on a newstand, of *Rocks and Minerals* , the still-popular maazine which just issued no. 6 of volume 71. On pages 15 and 16 of the 1936 issue is an article by Dr. Alfred C. Hawkins, who according to an Peter Zodac's "Editor's Note," had recently written a book titled *The Book of Minerals*, "popular with collectors." The book sold for $2.50 in a book-seller's ad in the magazine (the three volumes of *Dana's System* were $15.00 altogether, which gives you an idea, but Palache's volume on Franklin, N.J., was out-of-print).

Dr. Hawkins described a list of minerals from the old Brandywine Quarry, Wilmington, located a quarter of a mile northwest of the Baltimore & Ohio R.R. bridge on Brandywine Creek. Closed for over fifty years by that time, it was, in 1936, used as a storage yard adjacent to a leather manufacturing plant.

Included on the list of minerals, at that time in the collection of the Natural History Society of Delaware, were: an apatite species, bornite, "canbyite" (hisingerite), chabazite, chalcopyrite, epidesmine (once a variety of stilbite, now the species stellerite), a species of garnet, hisingerite, laumontite, marcasite, natrolite, pyrite, pyrrhotite, quartz, and stilbite, from pegmatite or other veins in gabbro. Does anyone know where these specimens are today?

Dr. Hawkins stated that sillimanite was abundant between Wilmington and Brandywine Springs, to the west, and that one large mass he saw had to be left behind because it could not be

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broken up with an ordinary hammer. He went on to say that white tremolite could be found in a white marble in the valley of Hockessin, on the northwest border of the state. Also, he himself had bought two fine crystals of vivianite from the Coastal Plain to the south, labelled "Whitlock's Pits, Middletown, Delaware." At one time, marl (clay plus lime) was dug there for fertilizer. The vivianite crystals were over 2 cm in length, perfectly transparent, and dichroic, as well, turning from blue to green, or vice versa, when turned 90 degrees. In a final note, Dr. Hawkins suggested that collectors look for microscopic inclusions in the common mica books available in the northern sections of Delaware.

As well as the various longer articles, there is a single page on "Old Labels," by a Leo N. Yedlin (later known as Neal?), and ads, such as Ward's for 1 1/2" celestine crystals for 20 cents, and 3/4" rhodochrosite rhombohedrons for 75 cents each, which make this issue of *Rocks and Minerals* and interesting historical record.

You could have had a year's subscription for $1.50 in those days, but you'll have to bid a lot more for this one issue at the fall Symposium auction for the benefit of the Memorial Grand Fund.

NOTES ON CHLORINE-RICH PARGASITE FROM COATESVILLE, CHESTER COUNTY, PENNSYLVANIA

Edward S. Grew, University of Maine
David F. Hess, Western Illinois University
David E Lange, Harvard University
Robert C. Smith, II, Pennsylvania Topographic and Geologic Survey
Arthur Montgomery, Professor Emeritus, Lafayette College

Abstract

Chlorine-rich ferroan pargasite occurs with tourmaline and sodic plagioclase in a veinlet also containing dumortierite, kyanite and quartz; this veinlet cuts anthophyllite-magnesio-hornblende-tschermakite-biotite-plagioclase-quartz-almandine gneiss, of probable Grenville age (Precambrian), about 3.25 km northwest of the center of Coatesville, Chester County, Pennsylvania. This is the first validated occurrence in Pennsylvania of ferroan pargasite. Identification was made by means of electron microprobe analysis. Chlorine-rich minerals have been reported from Precambrian rocks in New Jersey and southeastern New York, as well as in the Adirondack Mountains.

Hess et al. (1994 and 1995) reported an unknown chlorine-rich mineral with green to brownish-blue pleochroism from the Oak Tree outcrop, a locality about 3.25 km northwest of the center of Coatesville, Chester County, Pennsylvania. The mineral occurs in minute amounts around blue-green tourmaline (schorl) in a veinlet within a few mm of its contact with anthophyllite-biotite wallrock. Associated plagioclase is An_7-An_{15}. Proceeding towards the center of the veinlet: first, dusky-colored kyanite is found with tourmaline and minor dumortierite; then, dumortierite with quartz and two generations of tourmaline (Hess et al., 1994 and 1995).

Two grains of the mineral were analyzed at Harvard University on a Cameca electron microprobe. Formulae normalized to 46 anionic charges used for amphiboles, i.e., 22 O + 2 (OH, Cl, F), show the mineral to be an amphibole (Table 1). The average composition was also normalized to 13 octahedral and tetrahedral cations, which gives the maximum Fe^{3+} content allowed by amphibole stoichiometry. The oxidation state of Fe cannot be directly determined with the electron microprobe, and the small size of the grains precludes wet chemical or Mossbauer techniques. Nonetheless, substantial Fe^{3+} is probably present, which in combination with

NOTES ON CHLORINE-RICH PARGASITE FROM COATESVILLE, PENNSYLVANIA

substantial Fe^{2+}, would explain the intense coloration of the amphibole. From the formula, this amphibole is placed in the ferroan pargasite field (Leake, 1978). With less than 1 Cl per formula unit (p.f.u.), it is best characterized as chlorine-rich. This is the first validated occurrence in Pennsylvania of the ferroan variety of pargasite, and, as far as we are aware, the only report to date of a chlorine-bearing amphibole in the Honeybrook Upland (Piedmont Province) of Pennsylvania.

This pargasite is the fifth amphibole species to be found at this locality. Previously, Hess et al. (1994 and 1995) had reported anthophyllite, alumino-anthophyllite/gedrite (Si = 7.00 p.f.u.), magnesiohornblende, and tschermakite in the wallrock, with anthophyllite and magnesiohornblende possibly evolving from the alumino-anthophyllite and tschermakite during retrograde metamorphism. The chlorine-rich ferroan pargasite is found in a part of the veinlet system close to its contact with the wallrock. Some of the wallrock hornblendes contain up to 0.5% Cl. We suggest that there was interchange of chlorine between the veinlet and wallrock during the Grenville, or later, metamorphism of the area.

As far as we are aware, Cl-rich amphiboles have not been reported from other localities in Precambrian rocks in Pennsylvania, either. For example, Rosenzweig and Watson (1954) reported only 0.06 wt.% Cl in pargasite from Van Artsdalen Quarry, Bucks County. Identification of this amphibole as pargasite (Si = 6.199 p.f.u.) is based on the formula recalculated to 23 anions with OH + F + Cl = 2 (ideal stoichiometry) instead of 24 anions with measured water, as was done by Rosenzweig and Watson, who reported Si = 6.32.

However, chlorine enrichment is known from Precambrian rocks in New Jersey and southeastern New York. Notable examples include hastingsite and chlor-hastingsite at Cornwall, N.Y. (0.5-5.0 wt% Cl, Webster et al., 1995) and Sterling Hill, N.J. (2.1 wt% ClO [sic], Dunn, 1995), as well as prismatine-bearing (Grew et al., 1996) gneiss from Mase Mountain, N.J. (540-1240 ppm Cl, Young, 1995). In addition, chlorine-rich ferropargasite and a chlor-ferropargasite are reported in the Grenville of the Marcy massif, Adirondack Mountains, N.Y. (1.8-3.0 Cl, Morrison, 1991).

References

Dunn, P.J., 1995, *Franklin and Sterling Hill, New Jersey: The World's Most Magnificent Mineral Deposits*, The Franklin-Ogdensburg Mineralogical Society, Franklin, N.J., p. 455.

Grew, E.S., Cooper, M.A., and Hawthorne, F.C., 1996, Prismatine: Revalidation for Boron-Rich Composition in the Kornerupine Group, *Mineralogical Magazine* , vol. 60, no. 3, pp. 483-491.

Hess, D.F., Montgomery, A., and Smith, R.C., II, 1994 and 1995, Dumortierite, Tourmaline, Tschermakite and Mineral X-Si-Al-Ca-Cl from Coatesville, Chester County, Pennsylvania: Geologic History of a Veinlet Occurrence and Surrounding Wallrock. *Friends of Mineralogy, Pennsylvania Chapter, Newsletter*, vol. 22, no. 3 and 4 and vol. 23, no. 1.

Leake, B.E., 1978, Nomenclature of Amphiboles, *American Mineralogist*, vol. 63, pp. 1023-1052.

Morrison, J., 1991, Compositional Constraints on the Incorporation of Cl into Amphiboles, *American Mineralogist*, vol. 76, pp. 1920-1930.

Rosenzweig, A. and Watson, E.H., 1954, Some Hornblendes from Southeastern Pennsylvania and Delaware, *American Mineralogist*, vol. 39, pp. 581-599.

Webster, J.D., Leger, A., and Rebbert, C.R., 1995, Extremely High Chlorine Contents in Biotites and Amphiboles from Black Rock Forest, Hudson Highlands, N.Y., *EOS, Transactions of the American Geophysical Union* (Supplement), vol. 76 (17), p. S290 (abstract).

Young, D.A., 1995, Kornerupine-Group Minerals in Grenville Granulite-Facies Paragneiss, Reading Prong, New Jersey, *Canadian Mineralogist*, vol. 33, pp. 1255-1262.

Table 1. Electron microprobe analyses of chlorine-rich, ferroan pargasite in section #Du92-OT, Oak Tree outcrop, near Coatesville, PA

Point	91 No Fe^{3+}	92 No Fe^{3+}	Average No Fe^{3+}	Average M + T =13
		Wt%		
SiO_2	38.13	37.77	37.95	37.95
TiO_2	0.02	0.02	0.02	0.02
Al_2O_3	16.85	17.33	17.09	17.09
Fe_2O_3 (calc)	-	-	-	7.32
FeO (meas*)	20.36	20.77	20.57	13.98
MnO	0.24	0.30	0.27	0.27
MgO	6.22	5.73	5.98	5.98
CaO	10.05	10.47	10.26	10.26
Na_2O	2.73	2.61	2.67	2.67
K_2O	0.78	1.05	0.92	0.92
F	0.14	0.05	0.10	0.10
Cl	2.58	2.42	2.50	2.50
H_2O (calc)	1.19	1.28	1.23	1.24
O=F,Cl	-0.64	-0.57	-0.60	-0.60
Total	98.65	99.23	98.94	99.68
	Formulae per 22 O + 2 (OH,Cl,F)			
Si	5.987	5.918	5.952	5.843
$^{[4]}Al$	2.013	2.082	2.048	2.157
Sum T	8.000	8.000	8.000	8.000
$^{[6]}Al$	1.104	1.118	1.111	0.943
Ti	0.002	0.002	0.002	0.002
Fe^{3+}	-	-	-	0.848
Fe^{2+}	2.405	2.501	2.453	1.800
Mn	0.032	0.040	0.036	0.035
Mg	1.456	1.338	1.397	1.371
Sum M	5.000	5.000	5.000	5.000
Fe^{2+}	0.268	0.220	0.244	-
Ca	1.691	1.758	1.724	1.692
Na	0.042	0.022	0.032	0.308
Sum B	2.000	2.000	2.000	2.000
Na	0.790	0.771	0.780	0.489
K	0.156	0.210	0.183	0.180
Sum A	0.946	0.981	0.963	0.669
Total cations	15.946	15.981	15.963	15.669
F	0.070	0.025	0.047	0.046
Cl	0.686	0.643	0.665	0.652
OH	1.244	1.333	1.288	1.301

Note: Fe was measured as FeO. Water content was calculated assuming OH + F + Cl = 2. In calculating the formula in column 4, Si + Al + Ti + Fe + Mn + Mg was normalized to 13 and ferrous/ferric ratio adjusted to bring total cationic charge to 46.*FeO is calculated in col. 4.