FRIENDS OF MINERALOGY
Pennsylvania Chapter

NEWSLETTER

Spring, 1994 Vol. 22, No. 1 Page 1

## MEMORIAL FUND GRANTS

The F.M., Pa. Chapter Memorial Fund Committee (Juliet Reed, Arnold Mogel, and Tania Brice) has awarded grants to two graduate students, who are working on theses which include topics of interest to mineralogists and mineral collectors in our region.

Jennifer Ann Zarnowsky is a student in the M.S. program at the Department of Geology of Temple University, Philadelphia. In a recent paper, co-authored with her adviser, Dr. George H. Myer, for the April "Piedmont Workshop," held this year at Temple, Jennifer outlined her study on a serpentine-rich ultramafic body, located near West Chester, bounded by gneissic rocks to the south and schistose rocks to the north. Preliminary XRD (X-Ray Diffraction) studies have indicated the presence of several minerals which would be new to Pennsylvania. Jennifer is also studying textural relationships within the ultramafic body. She will report on her findings to the F.M., Pa. Chapter, membership when she completes her studies.

Andrew Sicree is a candidate for a doctorate in geology at the Pennsylvania State University. He is planning to use his grant in a study of organics in the sphalerite of the Friedensville, Pennsylvania, in relation to sphalerite in Mississippi Valley deposits. Andrew, who is also the Curator at the Pennsylvania Earth & Mineral Sciences Museum, site of the F.M., Pa., Fall Symposium in 1993, will write up his findings for the "Newsletter."

## OPPORTUNITY KNOCKS

F.M., Pa. Chapter, members, by giving to the Memorial Fund, have the opportunity of supporting outstanding students, chosen by the Committee for their subjects of interest to the membership, and of reading reports on their mineralogical studies.. All of us have collector friends whose memories we treasure. Please send a generous check (made out to Friends of Mineralogy, Pa. Chapter) to the treasurer, Tania Brice (Apt. F-10, 310 Lopax Rd., Harrisburg, PA 17112).

## MEMBERSHIP INFORMATION

**Dues**: for the Pa. Chapter, which include $5.00 for the National organization, are $10.00, or $8.00 for seniors over 62 and students. Please mail a check to Marge Matula, 10231 Honeysuckle Drive, Walnutport, PA 18088.

**Address Change**: William Confer, Jr., 184 Fenwick Drive, Port Matilda, PA 16870.

## COMING EVENTS

Editor's Note: "Coming Events" notices are culled from exchanged newsletters of groups, or special notices. News of events in Pennsylvania and the surrounding states are very welcome. Please, since this is a quarterly publication, send in dates and particulars well ahead, so they may be included.

**July 8-10: Eastern Federation Show,** at the New York State Fairgrounds, hosted by the Gem and Mineral Society of Syracuse, N.Y.

**July 28-29: "Scenic River Days"** on the Schuylkill River waterfront in Reading, Pa., 5 p.m. to 10 p.m. on Thursday and Friday, 12 noon to 10:00 p.m. on Saturday, and 12 noon to 6 p.m. on Sunday. The Berks Mineralogical Society will have a setup in the Reading Public Museum tent, set among the many festivities.

**August 17-21: "Lost Dutchman Gemboree",** Lebanon Fairgrounds, Rt. 72, from 3 p.m. to 7:30 p.m. on Wednesday, from 10 a.m. to 7:30 p.m., Thursday through Saturday, and 10 a.m. to 5 p.m. on Sunday. The fees are $4.00 per day for adults, and $3.00 for those from 6 through 13.

**October 8: "Mineralfest"** of the Pennsylvania Earth Science Association at Macungie Memorial Park, 9 a.m. to 3 p.m. Contact Ed Richards (610-395-5138) for details.

**October 15-16: "Earth Treasures"** Gem and Mineral Show of the Mineralogical Society of Pennsylvania, at the South Lancaster County Fairgrounds. Hours: Saturday, 10-6, Sunday, 10-5.

## NEWS AND VIEWS

### Golden Microscope Award

Congratulations to Margaret (Marge) Matula, who discovered the mineral from the Bachman Mine, Lehigh County, named for her, and is our Chapter's hard-working Membership Chairman, as well as an active member of the Pennsylvania Earth Sciences Association. She was presented with the Golden Microscope Award at the Micromount '94 show of the Rock and Mineral Club of Lower Bucks County, for furthering the hobby of micromounting.

### French Creek Tourmaline: What Species?

Dr. Peter Leavens, of the Department of Geology at the University of Delaware, is seeking tourmaline from French Creek Mines, St. Peter's, Chester County. The specimen he has is a pseudomorph of a chlorite species, after an unknown species of tourmaline. Sam Gordon, in the "Mineralogy of Pennsylvania (1922, p. 179), describes the French Creek tourmaline as " black, radiating crystals." Dr. Leavens needs a specimen of the tourmaline itself, which may be a rare Ca/Fe species, and appeals to the membership to send him specimens at 101 Penny Hall, Department of Geology, University of Delaware, Newark, DE 19716-2544. He will report to the membership by way of the "Newsletter."

## It's a Small World

"Rock Chatter", the newsletter of the Lower Bucks Rock and Mineral Club, reported on the January Open House for visitors to get together to view the mineral exhibits in the halls and mineralogy classroom of the Geology Department at Bryn Mawr College. A special exhibit filled with Vaux Collection specimens, in one of twenty-six hall cases on view , had been set up to commemorate the Academy of Natural Sciences of Philadelphia expeditions in the 1920's, co-sponsored by curator Samuel G. Gordon and patron George Vaux, Jr.

Of special interest to the Lower Bucks Club and the host, Juliet Reed, the Associate Curator of the mineral collections, were the remarks made by member Al Jehle concerning the design and building, in 1938, of six glass display cases for the teaching displays in the mineralogy classroom. It seems that Al was requested by Sam Gordon, Curator at the Academy, to make these display cases for the halls and mineralogy classroom of the Geology Department, then headed by Dr. Edward H. Watson. The cases replicate the cases in the long-gone Gordon-designed exhibits at the Academy, and remain the same fine teaching aids.

Al also collected or acquired several of the fine large specimens for the two large hall cases he designed, which are located just outside the mineralogy classroom door. Included in the cases are specimens from the Department collection, which dates back to 1895, when Florence Bascom founded the Department.

Visitors are welcome to view the hall cases, from 9 a.m. to 5 p.m. during the academic year, or by appointment with Juliet Reed, Associate Curator. Call her at home (215-688-6180) for a tour, or for information on parking and a map.

## Congratulations

Member Karl Brubaker, and his wife, Jean, were recently awarded life memberships for their many contributions to the Mineralogical Society of Pennsylvania, particularly their efforts at the annual Show over many years.

## Author! Author!

Ronald Sloto, who lives nearby, is co-author, with his wife, Lana L. Dickinson, of an article on "Famous Mineral Localities: The French Creek Mine, St. Peter's, Chester County, Pennsylvania," in the March-April, 1994, issue of the "Mineralogical Record." The article includes a well-written account of the history of the mine, and the geological background, as well as descriptions of the numerous minerals reported from the locality. The article is illustrated with historical maps and photographs, and two pages of colorful photographs by Ron of mineral specimens from Pennsylvania collectors Joseph Varady and Jay Lininger, and the George Vaux, Jr. Collection at Bryn Mawr College.

X-ray diffraction analyses by Ron of several Bryn Mawr specimens, presently located in the French Creek Mines hall case in the Geology Department, confirmed the presence of laumontite (a white, chalky mineral) and mesolite (found with natrolite), minerals new to the list of confirmed French Creek minerals.

**Editor's Note:** Thanks to member Jay L. Lininger, and to Erston and Lois Barnhart, editors of the prize-winning "Rock Buster News" of the Central Pennsylvania Rock and Mineral Club, in which this article first appeared in March, 1994.

# CHRONICLES OF CENTRAL PENNSYLVANIA MINERALOGY

## Part One: Introduction

## Why Did They Call It Moore's Mill?

Many of you reading this article have visted, or are at least familar with, the location we call "Moore's Mill." The location, which has produced some of the finest phosphate minerals found in Pennsylvania, is located about four miles west of the village of Mt. Holly Springs, in Cumberland County. My fascination with the location began in 1962, when, as a young collector, I struggled to find it for the first time. In "those days," there was no popular field-collecting guide, such as the Pennsylvania Geological Survey Publication G33 (4th Edition, Geyer, Smith, and Barnes, 1976). Using my treasured and well-worn copy of Samuel Gordon's "Mineralogy of Pennsylvania" (1922), I spent hours hiking out on the northern rim of the South Mountain, searching for what turned out to be a small water-filled pit that was, incidently, not covered with bags full of collectable minerals. Just what was this one-of-a-kind mining operation that lay hidden in the woods outside of Mt. Holly? Over the years, I've been able to fill in some of the pieces.

## The Location has a Hundred-Year History[1]

The South Mountain of the nineteenth century was an area which bustled with activity. The iron mining industry in the Commonwealth was in full production during that era. Coupled with the development of the coal fields to the north and west, the two commodities had propelled Pennsylvania into the industrial giant among the states. The South Mountain had produced its share of successful iron manufacturing operations, with several dating back to the earliest days of the American Revolution. Several notable operations included the Pine Grove-Laurel Bank area (Cumberland County), the Mont Alto complex (Franklin County), and the Catoctin operation in northern Maryland. As active prospecting took place in all areas of the South Mountain, a number of large and valuable white clay deposits were located, particularly in the Mt. Holly Springs area. The geological forces which deposited the large residual beds of iron ore had also deposited large beds of pure white clay. A new industry thus developed at Mt. Holly Springs in the era following the Civil War. The clay was well-suited to the manufacture of tile and brick, and was found to be an excellent whitening agent in the manufacture of paper. Sometime during the latter part of the 1880's (no actual date has been recorded), the deposit of clay near Moore's Mill was located, The clay at this location was as pure as the deposits on the other side of the mountain, but had one peculiar characteristic. It was contaminated by numerous large pods of a hard clay that was later discovered to be pure aluminum phosphate, or

1. Please refer to the "References" on page 7 and 8 for sources and further reading on the historical data.

## CHRONICLES OF CENTRAL PENNSYLVANIA MINERALOGY

### Part One: Introduction (Cont'd)

wavellite. The discovery of this curious deposit in an area known as the Stuart Tract prevented its exploitation as a clay mine for sev eral years.

History doesn't record who recognized the potential that existed in the bed of phosphate nodules, but someone connected the value of the ore with the newly developing industry in the manufacture of safety matches. The flammability of pure phosphorus was known for many years, but had no practical use until the invention of the safety match, in 1855. This handy little device consisted of a wooden matchstick, with a phosphorus coating on the tip. The phosphorus was covered with an air-tight coating, which could be removed by striking the match tip on a coarse surface, thus igniting the phosphorus. Up to this point, all phosphorus used in safety match manufacture was processed from animal bones or organic phosphate-rock deposits. The bone or rock-phosphate was crushed, roasted, and treated with sulfuric acid to produce the refined product. Now that the industry was confronted with an available source of high-grade ore, a new reduction process would be required.

In 1898, a group of Philadelphia businessman formed a new venture, which they named the American Phosphorus Company. Aware that they would need to develop a new ore-reduction process, they hired G.C. Landis, a well-known chemist, to supervise the effort. The company began construction of a processing plant, and moved to acquire the ore deposit. The land which contained the phosphate-bearing clay was owned by T.J. Spangler of Mt. Holly Springs. Spangler was convinced that the deposit had great value, and, instead of selling the land, devised an arrangement by which he would be superintendent of the mine, and would be paid by a royalty on each ton of ore extracted. He, of course, would be in a good position to monitor how much ore was extracted.

The mine was opened in 1900, but several non-productive years were spent in prospecting the deposit and the experimentation in reducing the ore. G.C. Landis was familar with the patents available in phosphorus reduction, and, drawing on this knowledge, devised a method to smelt the wavellite in a satisfactory manner. The process required the introduction of great heat, and could only be attained by the use of the newly-invented electric furnace. By 1905, all aspects of the mining and ore processing were in full operation. The ore was extracted by pick and shovel, and hauled down the mountain to the mill, which was situated near the bank of the Yellow Breeches Creek. About 400 tons of ore was mined in 1905, but the open pit, now about 30 feet deep, began to experience severe water problems. Later in that year, a test shaft was sunk near the open pit. At the 12-foot level, a large clay mass was encountered, which proved to be 40 feet thick. At the base of the clay, the miners struck 16 feet of manganese ore.

In spite of the early successes, signs of economic trouble were on the horizon. The processed phosphorus was a dangerous commodity, and some apparent mishandling led to a disastrous fire in the fall of 1905. This was a setback that caused a disruption in the processing of ore, but the company management raised the necessary capital to rebuild the plant. Water continued to plague the mining of ore, and its removal increased the cost of recovery. Several months after the rebuilt

## CHRONICLES OF CENTRAL PENNSYLVANIA MINERALOGY

### Part One: Introduction (Cont'd)

processing plant went back into operation, the management of the company recognized that the cost of operation for the electric reduction was greater than the value of the phosphorus it produced. In a desperate move to regain some semblance of profitability, the company owners decided to move the processing plant to York Haven, which was located by the Susquehanna River. In so doing, the company could obtain more cost-effective (river turbine) electricity for running the furnace. The move was successfully completed by the early part of 1906.

During the summer of 1906, the mine was visited and described (Stose, 1907) by George W. Stose, the eminent geologist and expert on the Appalachians, who was working for the U.S. Geological Survey. During his visit, the mine was filled with water, but the miners were building a drainage channel to carry excess water downhill. This engineering solution helped keep the mine in workable condition for several more years. In spite of attaining maximum efficiency, the American Phosphorus Company was unable to earn the profit it needed to survive, and was closed by the end of the decade. Once again, a well-conceived American enterprise failed because technological problems could not be overcome.

### Early Mineralogical History

When the mine had been closed for a number of years, it was visited by Pennsylvania's pre-eminent mineralogist, Samuel G. Gordon, in 1919 (Gordon,1925). Although existence of the location was mentioned in a publication by mineralogist John Eyerman (1911), Gordon was likely to have been the first mineralogist of note to visit the occurrence. The Cumberland County of 1919 was a sparsely populated agtricultural county, and thus Gordon, when preparing his field notes, placed the mine near the closest location of note, Moore's Mill. This was a reasonable assumption for the time, because the numerous grain-grinding mills along the Yellow Breeches Creek were important landmarks in the community. When Gordon published his findings in the "Proceedings of the Academy of Natural Sciences of Philadelphia" in 1925, he forever enshrined the name of " Moore's Mill" in the mineralogical literature. He had analyzed the abundance of species collected on the 1919 field trip, and confirmed the presence of five distinct phosphates: wavellite, cacoxenite, beraunite, variscite, and strengite. The variscite and strengite were new species for Pennsylvania.

### Recent History

Little attention was paid to the location until 1965, when Davis Lapham and Allen Geyer published the first of the four popular editions of publication G 33, "Mineral Collecting in Pennsylvania" (Geyer and Lapham, 1965) Soon, mineral collectors were able to easily locate the obscure location. As a young collector, I was fortunate in being able to collect each of the species described by Gordon, even though several were rare. One of them was a blue-green, massive mineral, which was found intergrown with wavellite in the hard nodules. I presumed this mineral to be

## CHRONICLES OF CENTRAL PENNSYLVANIA MINERALOGY

### Part One: Introduction (Cont'd)

variscite. And why not? Wasn't variscite a bluish-green mineral? More experienced collectors were suspicious, however, including early Central Pennsylvania Rock and Mineral Club member Dorothy Herman. Dottie was an astute and knowledgeable field collector, and the massive blue mineral made her curious enough to take it to State Mineralogist Davis Lapham for investigation. His subsequent analysis determined the species to be turquoise (Montgomery, 1969, p. 32-33). The true variscite at Moore's Mill occurred in clear to pale violet, radial crystal clusters and botryoidal masses.

Increased collecting of the area was conducted by a new generation of Pennsylvania collectors in the 1970's. The group, unofficially headed by Martin Anne, of Wrightsville, decided to excavate in an area north of the pit, which they presumed to be the ore-loading zone. Their efforts were rewarded with the discovery of numerous large, superb specimens of cacoxenite and beraunite. A photograph of one of Martin's specimens, by Delbert Oswald, was featured on the cover of the special Pennsylvania issue of "Rocks and Minerals" magazine, May-June, 1978.

This story provides a brief overview of the hundred-year history of Pennsylvania's most unusual phosphate occurrence. Do other undiscovered phosphates still exist at Moore's Mill? It is likely that they do, and perhaps another chapter in the story of this unique Central Pennsylvania mineral location is waiting to be written in the future.

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### Part One: Introduction

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## CALL FOR HELP

Dr. John Scott, professor of geology at Kutztown State University, Kutztown, Pa., and newly appointed editor of the newsletter of the Mineralogical Society of Pennsylvania, in which his request appeared, needs help on his research project on the minerals of Delaware County, Pennsylvania. This summer, with the help of several college students, he will be starting a thorough search of the available minerals sites in Delaware County, Pa.

They will be collecting rocks and minerals from all possible sites, including gutters of the road and house foundations. Anyone who can help with locating transient sites, such as new excavations or road-building areas , should contact him (610-682-2809) or Mike Harrison in Wallingford (610-874-7361). Donations of documented specimens and historical data will be welcome, as well as information on sources, such as old newspapers. All contributions will be acknowledged in any subsequent publications.

John related that he mapped most of Delaware County and visited most of the sites documented by Gordon in his "Mineralogy of Pennsylvania" (1922), between 1952 and 1972. He has a good working base of material, therefore, but would like to photograph and document old letters and correspondence, as well as mineral collections and their catalogs, and any other other sources.

This research project will take several years, and hopefully result in a number of publications, both popular and scientific. John may also be contacted by mail at his home (55 Hertzog School Rd., Mertztown, PA 19539), by phone at the Department of Physical Science, Kutztown University (610-683-4447, by modem through the Lehigh Valley Computer Group at 610-810-9010, 8-1-E, or by e-mail, jscott@acad.csv.kutztown.edu.