

# FRIENDS OF MINERALOGY

## Pennsylvania Chapter

# NEWSLETTER

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## ROCK PROBLEMS; ORIGINS OF DOLOMITE

Meridel Newton, '06 Bryn Mawr College

Note: In the spring of 2004, Bryn Mawr College students computer-produced posters with text and illustrations, similar, but smaller than those produced for professional meetings, in a Geology 102 lab supervised by Blythe Hoyle, Ph.D. At an F. M. Board meeting at Bryn Mawr in the spring of 2006, Doug Rambo saw this poster on dolomite, thought the subject would be of interest to mineral collectors, and asked Juliet Reed, associate curator of minerals at the College, to obtain permission to edit the text. Both Dr. Hoyle and the recent graduate are pleased to have the information from the poster published in the Newsletter.

The poster is illustrated with a color photo of a pink dolomite specimen, a photo of a limestone building, and a map of limestone and dolomite distribution in Pennsylvania, all found on the Internet (see the references). These are interspersed with the paragraphs of text, focused on the spring field trip area in S. E. Pennsylvania.

### INTRODUCTION

Much of the land of York County is covered in the Beekmantown and Allentown formation dolomite deposits. These deposits lead to such features as karst topography and underground caves. Dolomite beds puzzle geologists, as none are being laid down in the present day.

### WHAT IS DOLOMITE?

Dolomite, or dolomitic limestone is generally found in beds hundreds of feet thick. Probably deposited as calcite or aragonite (both  $\text{CaCO}_3$ ), the depositions are then transformed into dolomite,  $\text{CaMg}(\text{CO}_3)_2$ . Geologists are unsure of exactly how or what causes the dolomite transformation, dubbed diagenesis. Tropical near-ocean environments and magnesium-rich ground waters probably play a key role in the transformation. Dolomite is carbon-rich and can be found in marble, hydrothermal veins, and replacement deposits.

### WHAT IS KARST TOPOGRAPHY?

Karst topography is commonly found in carbonate rocks such as the limestone and dolomite which are found throughout Pennsylvania. It is the result of groundwater flowing over and through carbonate-rich rocks. The groundwater dissolves minerals out of the rock through which it flows, over time creating vast underground cave systems. Occasionally, these caves will collapse, creating sinkholes in the surface of the land. Ten percent of the Earth's surface is covered in karst topography.

*continued on page 4*

# President's Message

## Spring 2007



I owe the membership an apology for going this long without a newsletter to keep you informed of what is going on with the Chapter. There are times when you just get overwhelmed with the responsibility of everyday life and the secondary things get pushed to the side burner. I am afraid that is what happened with me. I promise that we are going to get back on track as of now.

Ever since the Rochester Mineralogical Symposium in April, the mineralogical community has been buzzing from the find of wavellite from Lime Ridge at Mount Pleasant Mills, Snyder County, PA. Bryon Brookmeyer had a number of specimens from the original find on display at Rochester and Jeff Scovil even mentioned it in the "What's New" presentation. Shortly after the Rochester symposium our Field Trip Coordinator, Pen Ambler, was able to set-up a field trip into Mount Pleasant Mills for the Chapter to go in and explore this new site. The quarry superintendent even arranged to have a backhoe and operator available to us to clear areas where the field trip attendees might want to explore. From what I was told, most everyone went away with some wavellite even though it may not have been the rich green color that was sought after. I got to examine a few pieces that were collected later on that day by John Ebner and Fred Stohl at a micromounter meeting back in May. It looks like there is minor cacoxenite and possible beraunite associated with the wavellite from Lime Ridge as well, so make sure that you examine your specimens closely. Pen is already busy scheduling a few more trips to take us through the summer.

Because it is important to us to keep you notified, please make sure that our membership chairperson, Cathy Mogel, has your most up-to-date contact information (address/phone number/e-mail address). Let Cathy know if you would like to be contacted in the event that a field trip comes up on just a couple days notice. Our VP, Arnold Mogel, has been vigilant in contacting everyone he can in the organization to let them know that a field trip is coming up. By having your correct information he can get the word to you that much sooner. Cathy can be reached at (570) 739-4034 or via e-mail at [FMPAMEMBERSHIP@verizon.net](mailto:FMPAMEMBERSHIP@verizon.net).

We are currently making plans for this year's symposium. The lecture portion of the event will be on Saturday November 3rd at the Delaware County Institute of Science in Media, PA and there will be a field trip on Sunday November 4th. The next issue of the newsletter will have more details with respect to the symposium.

As usual, please feel free to contact me or any member of the board of directors with any questions, comments, or concerns.

Regards,  
Doug Rambo  
President,  
F.M. PA Chapter, Inc.

## CARNOTITE FROM MAUCH CHUNK, PA.

A letter to Juliet Reed, then editor of the F.M., Pa. Chapter, Newsletter, was enclosed with a manuscript from Allen Heyl on some early history of Pennsylvania minerals and mineralogists, and a description the 40 species of minerals from the state that he had noted recently in the huge classic collection in the British Museum of Natural History.

These articles were published in the Newsletter, but the letter was not. Part of it remarked on the classic localities of Pennsylvania specimens represented in the British Museum, and the second section was on the verification of the mineral Carnotite, as follows:

" . . . . One of the older occurrences I wish to verify and restore is for Carnotite, first described by Edgar Wherry when he was at Lehigh University in the early 1900's. He published two papers on it. The second and most important one (Wherry, E.T, 1914, U.S.G.S. Bulletin 590, p. 147-151) gives new and most important data at the instigation of the famed chemist, W .F. Hillebrand, of the U.S. Bureau of Standards, to establish the quantities of potassium and calcium in the samples.

Wherry was totally aware of Tyuyamunite, the calcium analog, as compared to Carnotite, the potassium analog. In fact, the entire paper and new analyses were meant to prove that Carnotite existed in the trolley cut at Mauch Chunk. His recalculated analysis showed almost 8% K<sub>2</sub>O and only 1.43% CuO. I knew the trolley cut, which was there when my brother and I collected from it in the early 1930's. How-ever, it was removed not long afterwards; the new Rt. 309 is located about 15-20 feet below where it was located.

The original samples contain abundant muscovite and dark shale, which provided abundant potassium. The analysis very carefully made by Wherry is given below. " A " is from a sample with shale impurities.; "B" was recalculated; and "C" is from a cave specimen from Utah, calculated by Clifford frondel (for comparison).

	<b>A</b>	<b>B</b>	<b>C</b>
V <sub>2</sub> O <sub>5</sub>	9.80%	21.73%	20.16 %
U <sub>2</sub> O <sub>3</sub>	33.11	68.99	63.42
K <sub>2</sub> O	3.55	7.86	9.58
CaO	0.64	1.42	0.64
Fe <sub>2</sub> O <sub>3</sub>	17.68	00.00	0.04
H <sub>2</sub> O	7.13	00.00	1.35
Insol.	<u>29.62</u>	<u>00.00</u>	<u>0.22</u>
	99.53%	100.00 %	99.40 %

This analysis, done especially for K vs. Ca, comes out as good Carnotite, K<sub>2</sub>(UO<sub>2</sub>)<sub>2</sub> V<sub>2</sub>O<sub>8</sub>·3H<sub>2</sub>O. There is a little CaO (1.42%), but 7.86% K<sub>2</sub>O. No way can this be called Tuyuamunite, for which Wherry was specifically looking.

Most of the recent samples taken from beds 15-20 feet below are Tyuyamunite (1 found this to be true). Clifford frondel (1958, U.S.G.S. Bulletin 1064, p., 247), then the world's greatest authority on uranium minerals states under Carnotite: "It [Carnotite] occurs in the conglomerate of the Pottsville formation near Mauch Chunk, Carbon County, Pennsylvania, with Uranophane, Beta-uranophane, Liebigite, and Tyuyamunite." I am sure that he read both of Wherry's papers (1912, 1914), and read the later analyses and contacted Wherry himself. So both Carnotite and Tyuyamunite should be listed there, for sure, the lower outcrops have Tyuyamunite, but they are far below the old cut where Wherry collected it and both are parallel to the strike of the beds which dip westward. By the way, the upper outcrops of sandstone and conglomerate had abundant muscovite, not present in the lower beds. Thus they had much more source potassium.

Thus, hopefully, I've established both Carnotite and Tyuyamunite at Jim Thorpe (formerly Mauch Chunk) for our list. If you, Juliet, remember, I did the same for Nesquehonite and Lansfordite long ago, because I was given a stalactite of water-clear Lansfordite by Peter Zodac, who had collected it that day. "

---Allen Heyl

## ROCK PROBLEMS; ORIGINS OF DOLOMITE . . . continued from page one

### VALLEY VIEW DOLOMITE

The dolomite of Valley View, York County, Pa., is interbedded with limestone and contains trace fossils and stromatolites, but few larger fossils. While some calcite beds dolomitize, and others do not, no one is quite sure what leads to the diagenesis of some beds but not others. Some suspect that a difference in porosity leads to dolomitization, when pores created by fossil molds within the original rock are replaced by dolomite. However, a lack of evidence means nothing can definitely be concluded.

### CIRCUMSTANCES: WHEN THE DOLOMITE WAS LAID DOWN?

The Beekmantown dolomite cropping out in Valley View dates back to the early and middle Ordovician Period (500 to 440 mya). The beds were formed at the time of the formation of the Appalachian basin, at a time when the entire area was under water as the North American and African subcontinents were separating. The dolomite of Valley View is highly folded and tortured indicating very active, repeated mountain building.

### REFERENCES

<http://mineral.galleries.com/minerals/carbonate/dolomite/dolomite.htm>

<http://www.libraries.psu.edu/emsl/guides/X/york.htm>

<http://www.denr.state.pa.us/topogeo/index.aspx>

<http://people.uncs.edu/dockal/gly312/co3diagen/carbdiagen.htm>

## THE HEYL AND QUICKEL COLLECIONS, BRYN MAWR COLLEGE

Computer cataloging of the 1500 Pennsylvania specimens in the Allen Heyl collection, donated to Bryn Mawr College, is almost complete, as is the cataloging of the 1000-specimen James Quickel Pennsylvania collection.

Alphabetical arrangement in storage cases of the specimens in the two collections is proceeding by County, Town or District, and Site. Heyl's collection covers the period from the 1930's to the 1990's, mostly from southeastern part of the state, while the Quickel collection is rich in central Pennsylvania material, in addition to the classic southeastern localities.

This fall, minerals from the Heyl and Quickel collections will be on exhibit in the Pennsylvania cases on the second floor of the Geology Department. Visitors are welcome to view the exceptional minerals in 29 hall cases on weekdays during the academic year, and may have a tour, which includes a look at minerals in storage, by appointment. Call (610-388-4148) or e-mail ([kgreed@aol.com](mailto:kgreed@aol.com)) Juliet Reed, associate curator, for directions, details of parking and hours, or to make an appointment for a tour.

-- Juliet Reed

## Field Trips!

- National Limestone Quarry – April 2007
- Meckley Quarry – May 2007
- Binkley Ober Quarry – June 2007

Do we have your current e-mail address or telephone number?

Please get us this information so that we can contact you about field trips and other events.

Send a short e-mail to Cathy at [FMPAMEMBERSHIP@Verizon.net](mailto:FMPAMEMBERSHIP@Verizon.net)

Send her a post card, letter, with your name and contact info

or call me David at 1-216-231-4600 x3229 and leave me a voice message with the info

REMEMBER you HAVE to be a current member to go on field trips, so . . . .

## DUES

**If you haven't sent them in for 2007, do it now!**

Please make checks payable to FM Pa. Chapter

Dues payments may be mailed to Cathy Mogel

15 Oak Rd.

Schuylkill Haven , Pa 17972

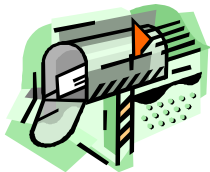
*(please DO NOT SENT dues payments to Marge Matula )*

## BOOKS IN THE PENNSYLVANIA GEOLOGICAL SURVEY EDUCATIONAL SERIES

The following free pamphlets in the Educational Series, in single or multiple copies for a group, are available on request from the Pennsylvania Geological Survey, either by mail from the Survey at P. O. Box 8453, Harrisburg, PA 17105-8453 or by phone from Jody Zipperer, Publication Services (717) 702-2073.

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- ES 11 Sinkholes in Pennsylvania
- ES 12 The Nonfuel Mineral Resources of Pennsylvania

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Thank you, your editor David Saja

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### **Nittany Gem & Mineral Show**

June 30 - July 1, 2007  
 Saturday 10 a.m. - 6 p.m., Sunday 11 a.m. - 5 p.m.  
 Mt. Nittany Middle School  
 Brandywine Drive, Boalsburg PA, off US Rt. 322,  
 4 miles east of  
 State College, Pennsylvania

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