Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc., meeting in State College, Pennsylvania
Contact information on back page

Editor (see back page):
David C. Glick

February, 2021 **Visit our web site: www.nittanymineral.org**

February 17th

Zoom meeting ONLINE:

Caves and Karst: The Crossroads of the Geosciences

Dr. George Veni

A karst area in China

Early geological studies often focused on caves. Their alluring darkness fired imaginations on what they contain and how they form. During the first half of the 20th Century, that fascination was lost. Caves were relegated to a category of scientific curiosity and karst was a term rarely used outside of Europe. Over the past 70 years, interest in and respect for cave and karst science has regrown, leading to 2021's global recognition as the International Year of Caves and Karst. This lecture follows the goals of the Year to inform the lay and professional public about caves and karst, in this case by focusing on its multidisciplinary nature within the geosciences. Hydrology, geomorphology, mineralogy, economic geology, paleoclimatology, geobiology, geoarchaeology, critical zone investigations, carbon cycling, environmental geology, and planetary studies are some of the fields that benefit from unique insights produced by caves and karst. This lecture will provide an overview of not just these various fields, but how they intersect to yield even greater knowledge of our world.

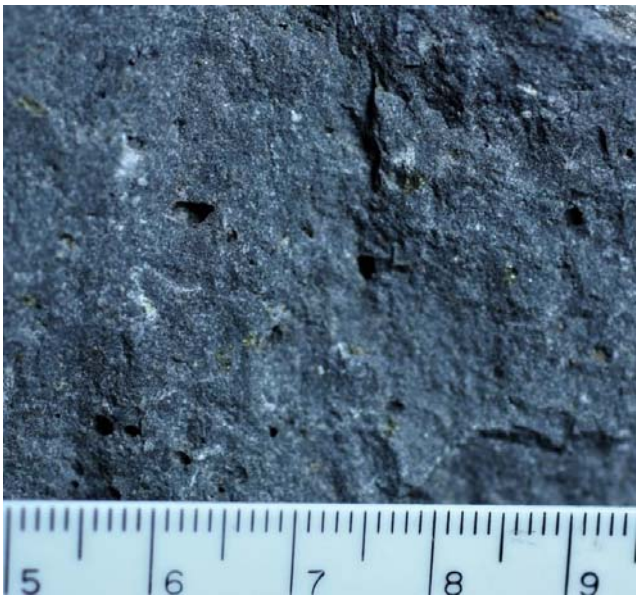
Biography: Dr. George Veni is the Executive Director of the National Cave and Karst Research Institute (NCKRI) and an internationally recognized hydrogeologist specializing in caves and karst terrains. He received his Ph.D. from The Pennsylvania State University. Prior to NCKRI, he owned and served as principal investigator of George Veni and Associates for more than 20 years. He serves as President of the International Union of Speleology and its organizer of the International Year of Caves and Karst. He has also served as a doctoral committee advisor for geological, geographical, and biological dissertations at the New Mexico Institute of Mining and Technology, The University of Texas at Austin, The University of Texas at San Antonio, and Harokopio University (Athens, Greece), taught karst geoscience courses as an adjunct professor for Western Kentucky University for 12 years, and taught karst science and management workshops internationally for NCKRI since 2011. He has published and presented nearly 270 papers, including six books, on hydrogeology, biology, and environmental management in karst terrains.

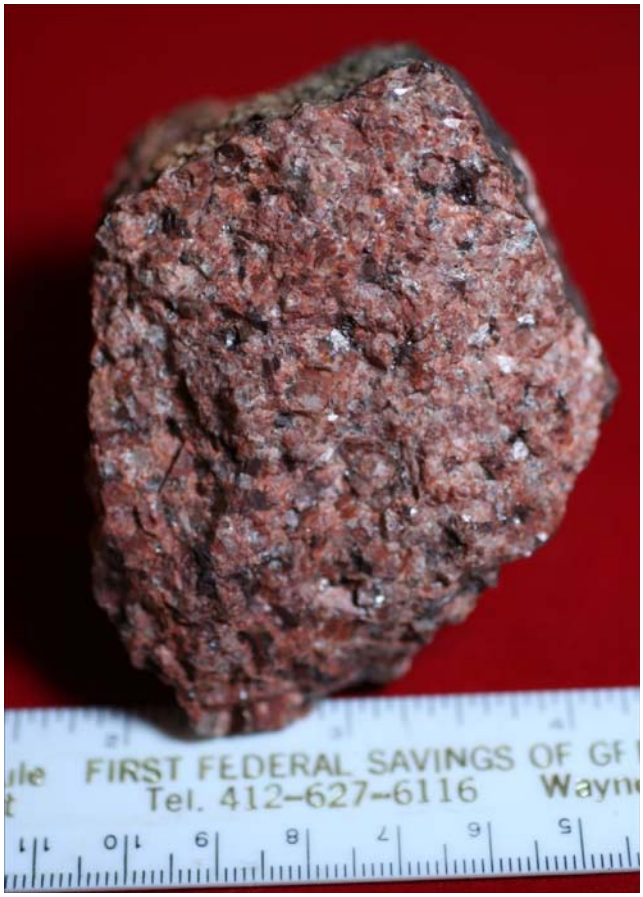
Please join us online for this presentation! The Zoom link will be e-mailed to all paid members who receive our e-mails; others can request it by e-mailing <xidg@verizon.net>. We'll plan to start at 7:30 p.m.; we can have informal discussions, then we can do any questions & answers and announcements, and plan to start the presentation at 8:00 p.m. We will have some information on the main page of the web site as well. *-Editor*

What the Heck is Pegmatite? (The Basics)

by Bob Carnein
Lake George Gem & Mineral Club News
June 2019

Now retired to Colorado, Dr. Carnein was an active member of NMS when he was an Associate Professor of Geology at Lock Haven University. NMS is grateful for permission to reprint this and a subsequent article.





Introduction. As a Colorado mineral collector, you have no doubt run into the term pegmatite. If you've spent any time exploring what a pegmatite is or how they form, you probably find the concept a bit confusing. This and a future article should help clear up the confusion.

Igneous Rocks. Pegmatites are generally classified as igneous rocks. This means that they form by crystallization of material that was originally molten (called magma). As you may have learned elsewhere, petrologists (scientists who study the origins of rocks) divide igneous rocks into two types.

Volcanic (a.k.a. extrusive) rocks form when magma issues from fissures or vents at the Earth's surface. The rapid decrease in temperature and pressure as magma is extruded results in explosive eruptions (especially if the magma is viscous and rich in dissolved gases) or lava flows (if the magma is relatively "runny"). Volcanic rocks are generally fine grained (average particle size is less than 1 mm—1/25 inch), because the magma cools quickly and there isn't time for large crystals to form (Figure 1).

Figure 1. Volcanic rock (basalt), showing very fine grained texture due to rapid cooling from a melt.The rock consists mainly of plagioclase, pyroxene, and olivine. San Carlos Reservation, Arizona. (Carnein photo and collection)

Plutonic (a.k.a. intrusive) rocks form by crystallization of magma at some depth below the surface. The magma is often thought to move upward from below, as a result of buoyancy or, in zones where two tectonic plates converge, squeezing outward and upward. Because plutonic rocks remain buried during crystallization, there is more time for large crystals to form—they tend to be relatively coarse grained (average grain size more than 1 mm).

Figure 2. Coarse texture caused by slow cooling of magma beneath Earth's surface. Pikes Peak Granite. Minerals are quartz (pale gray), potassium feldspar (pinkish), and biotite(black). Plagioclase feldspar is also present. (Carnein photo and collection)

Naming Rocks. Like all rocks, igneous rocks are classified on the basis of two things. The first is their mineral composition. Geologists can't assign a name to a rock until they know what minerals are present and in what proportions. That's why they spend a lot of time looking at thin slabs of rocks (called thin sections) under a microscope or using a 10X magnifier in the field.

Considering how many different minerals there are (currently around 5470 recognized species; www.Mindat.org), this could get pretty complicated. However, when classifying rocks, geologists generally recognize two categories of minerals: (1) essential minerals are the ones that must be present to give a rock

a particular name. For example, granite must contain quartz, potassium feldspar (microcline or orthoclase), and lesser plagioclase feldspar. The proportions of these three minerals can vary within definite limits, but all must be present if the rock is to be called granite (Figure 2). (A commonly used igneous rock classification system can be found in Streckeisen, 1973.) (2) Accessory minerals include everything else that is present but isn't essential to naming the rock. For example, granite often contains the micas biotite and muscovite, as well as the common amphibole hornblende. These common accessories are often used to modify the name of the rock. Thus the Pikes Peak Granite is a biotite-hornblende granite; the Silver Plume Granite (which occurs west of Lake George) is a biotite-muscovite (or binary) granite. As some of you know, the Pikes Peak Granite may also contain a variety of other accessory minerals, including magnetite, zircon, garnet, etc. These are minor accessories and are not mentioned in the rock name.

All rocks are also classified according to their texture. This term refers to different things, depending on the major rock group (igneous, sedimentary, or metamorphic). For igneous rocks, we often talk about coarse grained(average particle size generally greater than 1 mm; Figure 2) vs. fine grained(average grain size less than 1 mm; Figure 1) rocks (a.k.a. phaneritic vs. aphanitic textures). Granite, by definition, is a coarse grained rock. A rock having the same mineral composition as granite but with an aphanitic texture can't be named granite—it's rhyolite. If you've been following what I have written so far, you might guess that phaneritic texture is typical of plutonic rocks; aphanitic texture occurs mainly in volcanic rocks.

TO BE CONTINUED

Frank Aplan, 1923 - 2020

Dr. Frank F. Aplan, Distinguished Professor Emeritus of Metallurgy and Mineral Processing at Penn State, passed away on November 3, 2020. He had been a member, supporter and speaker for Nittany Mineralogical Society. He presented several programs on historic mining in the American West, illustrated by his own photography, including NMS's second meeting (March 1994). NMS extends our sincere condolences to his family.

Frank was well respected and well liked in his professional organizations and at Penn State. He brought an impressive variety of experience to teaching and research, having served in the US Army in WWII and having worked for five different companies in the mining, metallurgical, and chemical industries. An obituary is available at <https://kochfuneralhome.com/tribute/details/2261/Frank-Aplan/obituary.html> and an extensive oral history interview from 1998 is at <https://ethw.org/Oral-History:Frank_F._Aplan>.

Geo-Sudoku

by David Glick

This puzzle contains the letters CILNOPSTU; one row or column spells a type of igneous rocks. As usual, if you've read this issue, you've seen it. Each block of 9 squares, each row, and each column must contain each of the nine letters exactly once. The solution is on page 8.

	U			I	L	S		T
I	P	C			T		L	
	L	S		O		C		
C	I	N				U		
	S			T	I			C
	T		U	S				L
S			O					P
	O			L				
	N	T		C				O

While We Can't Travel: Virtual Geo-Resources

Last month's presentation on Dinosaurs of Pennsylvania: What we know about them and their neighbors, by Dr. Steven E. Jasinski of the State Museum of Pennsylvania, can now be viewed via a link from the main page on our web site, along with earlier ones. Penn State's Earth and Mineral Sciences Museum has been adding many posts to their Facebook page, and videos to their YouTube channel. There's a link to that Facebook page , and many other online resources, on our web site. *-Editor*

FEDERATION NEWS

Nittany Mineralogical Society, Inc., is a member of EFMLS, the Eastern Federation of Mineralogical and Lapidary Societies, and therefore an affiliate of AFMS, the American Federation of Mineralogical Societies. The **Federations and our Society strongly encourage all members to read the monthly Federation Newsletters, available on their web sites**, which are linked from our web site, www.nittanymineral.org . We present brief summaries here in order to encourage readers to see the entire newsletters. There's a lot there!

Due to space considerations this month we have no summaries. Please see the Newsletters at <https://efmls.org/newsletter> and <http://www.amfed.org/news/> . *-Editor*

From the Editor: Printed Bulletin Status

Color printing problems continue. I still have some optimism about resolving this in the future, but for this month the printed copies may be in black and white. Thank you for your understanding.

Some Upcoming Shows and Meetings

Our web site http://www.nittanymineral.org has links to more complete lists and details on mineral shows and meetings around the country. See www.mineralevents.com for more.

Most upcoming events have been canceled.
Verify show schedule before traveling!

Che-Hanna Rock & Mineral Club show planned for March 27-28, 2021, has been cancelled

May 1-2, 2021: World of Gems & Minerals show, by Berks Mineralogical Society. Leesport Farmers Market Banquet Hall, 312 Gernant's Church Rd., Leesport PA 19533. Sat 10-5, Sun 10-4; Sat. ONLY tailgate section. <https://berksmineralsociety.com>

NMS BOARD MEETING NOTICE

NMS members are invited to attend Board of Directors meetings, which are generally held at 7:00 p.m. about two weeks prior to the general monthly meeting, although we do not meet every month. **The next date has not been set.** Members who would like to attend should contact president David Glick to verify time and place; those who would like to have their discussion item placed on the agenda should contact him at least one week in advance of the meeting.

Geo-Sudoku Solution

N	U	O	C	I	L	S	**P**	T
I	P	C	S	U	T	O	**L**	N
T	L	S	P	O	N	C	**U**	I
C	I	N	L	P	O	U	**T**	S
L	S	U	N	T	I	P	**O**	C
O	T	P	U	S	C	I	**N**	L
S	C	L	O	N	U	T	**I**	P
P	O	I	T	L	S	N	**C**	U
U	N	T	I	C	P	L	**S**	O

INVITE A FRIEND TO JOIN THE SOCIETY

The Nittany Mineralogical Society prides itself on having among the finest line-up of speakers of any earth sciences club in the nation. Everyone is welcome at our meetings. If you'd like to be part of our Society, dues are $20 (regular member), $7 (student rate), $15 (seniors), $30 (family of two or more members, names listed). Those joining in March or later may request pro-rated dues. Your dues are used for programs and speakers, refreshments, educational activities, Bulletins, and mailing expenses. Please fill out a membership form (available at www.nittanymineral.org), make checks payable to "Nittany Mineralogical Society, Inc." and send them in as directed, or bring your dues to the next meeting.

We want to welcome you!

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Facebook & Publicity: John Dziak: jjd264@psu.edu

The **Bulletin Editor** will welcome your submissions of articles, photos, drawings, cartoons, etc., on minerals, fossils, collecting, lapidary, and club activity topics of interest to the members. Please contact:

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209 Spring Lea Dr. phone: (814) 237-1094 (h)
State College, PA 16801-7226

Newsletter submissions are appreciated by the first Wednesday of the month. Photographs or graphics are encouraged, but please do not embed them in word processor files; send them as separate graphics files (TIF, or good to highest quality JPEG files, about 1050 pixels wide, are preferred). Please provide captions and name of photographer or artist.

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