MICROMOUNTERS OF NEW ENGLAND NEWSLETTER

The MMNE was organized on November 8, 1966 for the purpose of promoting the study of minerals that require a microscope

No. 310 November, 2010

OFFICERS 2010 - 2011

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Current Meeting
Saturday October 16
Trinity Lutheran Church
Chelmsford, MA

Map and driving directions are on last of this newsletter

For information regarding **MEETING CANCELLATION** due to inclement weather,
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Welcome to the November Micromounters of New England newsletter! The October meeting was another great gathering with interesting discussions about ultrasonic cleaners (consensus seems to be Branson ultrasonic cleaners), the Chandler Mine in Raymond, New Hampshire, which, if drained, could produce some wonderful minerals, a follow up on the Babingtonite study during September and additional thoughts on cleaning methods using Super Iron Out. It was decided that the November meeting would focus on Childrenite-Eosphorite as the species for the specimen competition.

The specimen competition was for Columbite-Tantalite. Entries were sparse but quality was superb! See photos in this issue.

Also I this issue I would like to note the article on the United State involvement in the Chile Miner Rescue. Without American ingenuity, know-how and technology, the outcome may have been dire. The accompanying article arrived via e-mail and was modified with photos and my interpretation of the definition of a true hero.

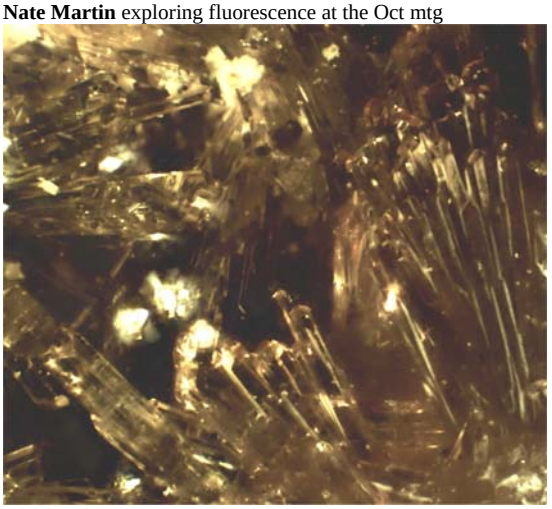
As previously discussed, we are expecting that the 2011 symposium will be held on June 11, 2011 at the Trinity Church in Chelmsford, MA. This is a departure from the tradition of holding the symposium in May. It is hoped that attendance will increase with a better date and that by holding costs down in a number of departments, we can make the event more accessible to all interested.

It should also be noted that the January meeting will occur one week later (January 22, 2011) to accommodate the annual Boston Mineral Club auction which will take place on 15 January.

If we don't see you at the November meeting on November 20, then may I be the first to wish you a Happy Thanksgiving!

Members, Friends, Visitors and Guests! Come to one of our meetings! Don't be shy!

Nate Martin exploring fluorescence at the Oct mtg



Childrenite, Palermo #1, N. Groton, NH

Wulfenite Manhan Lead Mine, Loudville, MA

The ***Newsletter*** is the official publication of the Micromounters of New England (MMNE). The last by-laws revision was May 16, 2009. The MMNE is a member of the Eastern Federation of Mineralogical and Lapidary Societies (EFMLS) (http://www.amfed.org/efmls) and the American Federation of Mineralogical Societies (AFMS) (http://www.amfed.org). Material from the *Newsletter* may be copied in other rock and mineral publications if credit is given to the author and the *Newsletter* and permission has been obtained from the author. If there are questions regarding copying contact the editor. The club address is c/o the Secretary. Meetings are held monthly, September through May, except for December, and usually on an informal basis in July. Meeting sites may change and will be posted in the *Newsletter* as far in advance as possible. Visitors are welcome to attend all meetings. Bring a microscope and light source if you have one.
DUES are $12/year for a single person and $16/year for a family membership, levied on a calendar basis. The family membership includes two adults and all children under 18 living at the same address. One copy of the *Newsletter* will be sent on a family membership.

Bienvenue les amis et les visiteurs!
Le **MICROMOUNTERS de la Nouvelle-Angleterre** a été organisée le 8 Novembre, 1966 dans le but de promouvoir l'étude des minéraux qui nécessitent un microscope.

Nous encourageons les jeunes à rejoindre notre club, nous offrons un tarif réduit pour les adhésions des jeunes. Nous nous félicitons de non-membres à visiter nos réunions mensuelles.

Comme son nom l'indique, nous sommes uniques, différents de clubs d'autres minéraux, et d'essayer de mettre l'accent sur cette différence. La plupart des, mais

Select Language
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NOTICE ANYTHING NEW ON THE MMNE WEBSITE???

We now have “Google Translate” installed allowing visitors to our web pages to translate our text to any of 50 foreign (to us) languages! Look for the Translate button at the top of the page. Now you can learn to view minerals in Swahili!

Micro-photographs of Palermo specimens from my collection have been posted on the MMNE website.

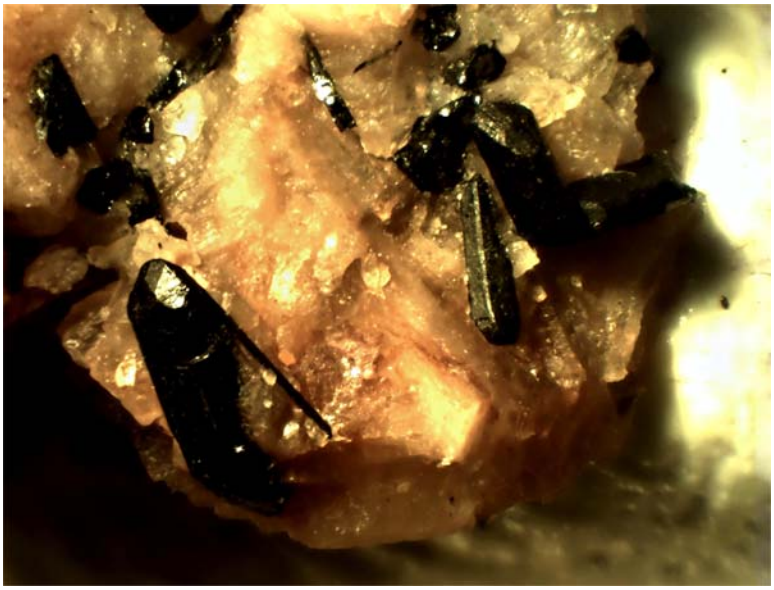
On the right are some Palermoites that I think came out very nicely.

Notice the Palermoite near the bottom right is capped with a goedkenite.

Palermo #1 is the type locality for both of these minerals. These and many more are now posted in a new gallery on the website.

New Images posted on the MMNE

October Mineral Photos: Columbite-Tantalite



Columbite
Toll Gate Quarry
Middletown, CT
Bob Wilken, specimen

Columbite
East of Ham Brook
Albany, NH
Bob Janules, specimen

While entries for the October competition were sparse, the quality of specimens did not suffer in the least.

Both examples of local Columbite were superb and photographed very well during the meeting.

Each picture is a stacked compilation of about ten photos from different planes of focus. Photos were taken with an AmScope digital camera attached to the club microscope.

Images are then combined using CombineZP software. Finally, they are cropped to show the best parts.

Nate Martin's Massive Columbite, historically significant as it is from the George Ehrenfried collection. Approximate width is 4 inches. And very heavy!

November Mineral Competition: Eosphorite-Childrenite

Ultrasonic Cleaners

Most members of the MMNE currently own or have used an ultrasonic cleaner to remove crud from their specimens. At a recent meeting most members present mentioned that they owned a cleaner by Branson. There are only a handful of ultrasonic cleaner manufacturers out there and each builds only a few models so choosing an ultrasonic cleaner for your self should not be too challenging.

Ultrasonic cleaners are built to serve different purposes. While industrial use has a large market, we are here to discuss the options available to a hobbyist and more specifically, a micro enthusiast. You can find jewelry cleaners, weapons cleaners, tabletop models and models made just for your dentures. Obviously, you should not do double duty by using the same piece of equipment to get the iron stains off your Palermoite that you would use to remove blueberry stains from your second set of choppers.

We will be looking at tabletop cleaners in this article. This distinction is in place because some industrial-oriented models are "recess mounted", sort of like a sink built into the counter top. The main advantage of tabletop ultrasonics is portability. While some of the larger units can be extremely heavy when filled with solution (and shouldn't be moved until emptied), when empty they can be moved to any location in the shop, lab, or wherever ultrasonics are needed.

What IS an Ultrasonic Cleaner?

An ultrasonic cleaner is a cleaning device that uses ultrasound (usually from 20–400 kHz) and an appropriate cleaning solution to clean delicate items. Typically, an ultrasonic cleaning machine may include the following basic components: cleaning tanks and bath, baskets, transducers, filter and a control panel. Obviously, every model has many additional features, but these are the very basic parts of a unit. The ultrasound is not effective without the cleaning solution; it enhances the effect of a solution appropriate for the item to be cleaned and the soiling. While micromounters may be perfectly happy with distilled water, some debris may be better addressed with Super Iron Out or a few drops of household dishwashing liquid. Other fields of cleaning may use many different types of cleaners, many of which would not work for our needs at all.

They are often employed for cleaning of jewelry, lenses and other optical parts, coins, watches, dental and surgical instruments, fountain pens, industrial parts and electronic equipment. In everyday use such devices may be found in use in most jewelry workshops, watch makers establishments, or in electronic repair workshops (where it could be used for cleaning an electronic device that has been exposed to particles which hinder its operation).

Ultrasonic cleaning uses high frequency sound waves to agitate an aqueous or organic compound. Cavitation bubbles induced by the agitation act on contaminants adhering to substrates like mineral specimens, metals, plastics, glass, rubber, and ceramics. This action also penetrates blind holes, cracks, and recesses. The intention is to thoroughly remove all traces of contamination tightly adhering or embedded onto solid surfaces. Solutions are mostly used warm, at about 50—65 °C (149 °F), however, in medical applications it is generally accepted that cleaning should be at temperatures below 38C to prevent protein coagulation.

What is cavitation? Cavitation is the name of the process where numerous gas bubbles are formed and expand in the liquid during the expansion phase. This is a low-pressure phase that in essence "cold boils" the water. The water vapor in the bubble condenses rapidly creating a vacuum-filled 'cavity'. In the compression phase, the great amount of pressure exerted on the newly expanded bubble leads to a sudden implosion of the bubble. The liquid molecules collide releasing a vast amount of impact energy that rapidly increases the local temperature producing a high-energy liquid stream that collides with the surface of the object being cleaned. This collision agitates contaminants adhering to the surface, effectively and efficiently dislodging them at micron levels.

Manufacturers

In addition to Branson (Bransonic), there are also models built by Crest, GemOro, Hagerty, Sonicor, Sharpertek and SonixIV.

What specifications are important to you?

Capacity How big are the specimens that need to be cleaned, and how many do you wish to clean at a time? This is a very important question as it will be one of the main factors determining the size of ultrasonic you will need. If you will only be cleaning micros and don't expect anything larger than a thumbnail specimen, the minimal capacity will save you some money.

Heat What manner of soil are you trying to remove? This is a very important question, as it will determine whether or not a "heat" option will be necessary. Most tabletop ultrasonic cleaners come in a standard, heated, and digital-heated models. It may be necessary because certain soils or clay may be very difficult to remove without heat. Ultrasonic transmission works best between 140 and 170 degrees Fahrenheit. Temperature plays a crucial role in the cleaning process. The number of cavitation bubbles increases proportionally to temperature increase. This happens up to about 60°C beyond which cavitation begins to decline and stops completely when the liquid's boiling point is reached; as the temperature and vapor pressure increase the cavitation energy decreases.

Variable Speed Frequency variation, modulation, or sweep prevents formation of standing waves in the tank. A fixed frequency can produce a harmonic vibration that damages delicate parts like electronic components. When operating in sweep mode, the ultrasonic generator's frequency is modulated slightly above and below the central frequency, typically ± 1-4 kHz. Until recently, sweep ultrasonics were only available in industrial and high end professional cleaning systems.

Prices

You can buy a small ultrasonic jewelry cleaner at Walmart for about $20. This will be plastic, won't have heat or variable speeds. It comes with a small basket capable of cleaning small items such as rings and thumbnail specimens. The consensus on Mindat's message boards is that it will not last, is not big enough and may put the uninitiated into believing that all ultrasonic cleaners are worthless.

The larger ¼ gallon models that are made of stainless steel are quite a bit more rugged, come with 1 year warranties, and with a bit of care can be relied upon to last for a very long time. A ¼ gallon model will cost from $175 - $235.

Some Best Practices While Using an Ultrasonic Cleaner

- Some recommend using distilled or (cooled down) boiled water.
- Many always work with a drop of unscented dishwashing soap. Others add a drop of ammonia.
- Always test first on a lesser quality specimen.
- Remember that the ultrasonic bath will get warm quickly while the machine is running.
- Be careful not to shock your specimens after removing from the ultrasonic bath.
- Be careful cleaning fluorite in an ultrasonic some brittle pieces may turn out with internal cracks.
- Hydrogen peroxide also helps loosen up some things, but careful with carbonates.
- Some put the hydrogen peroxide in a yogurt cup or a small glass, then place that in the water in the ultrasonic.
- Use the basket: objects placed in direct contact with the bottom of the tank may reduce the effectiveness of the cleaner, and prematurely wear out the transducer.
- Hot water may take the luster off some minerals, particularly carbonates such as azurite.

Safety

As with all tools, precautions are always necessary! Keep your fingers out of the unit when it is running!

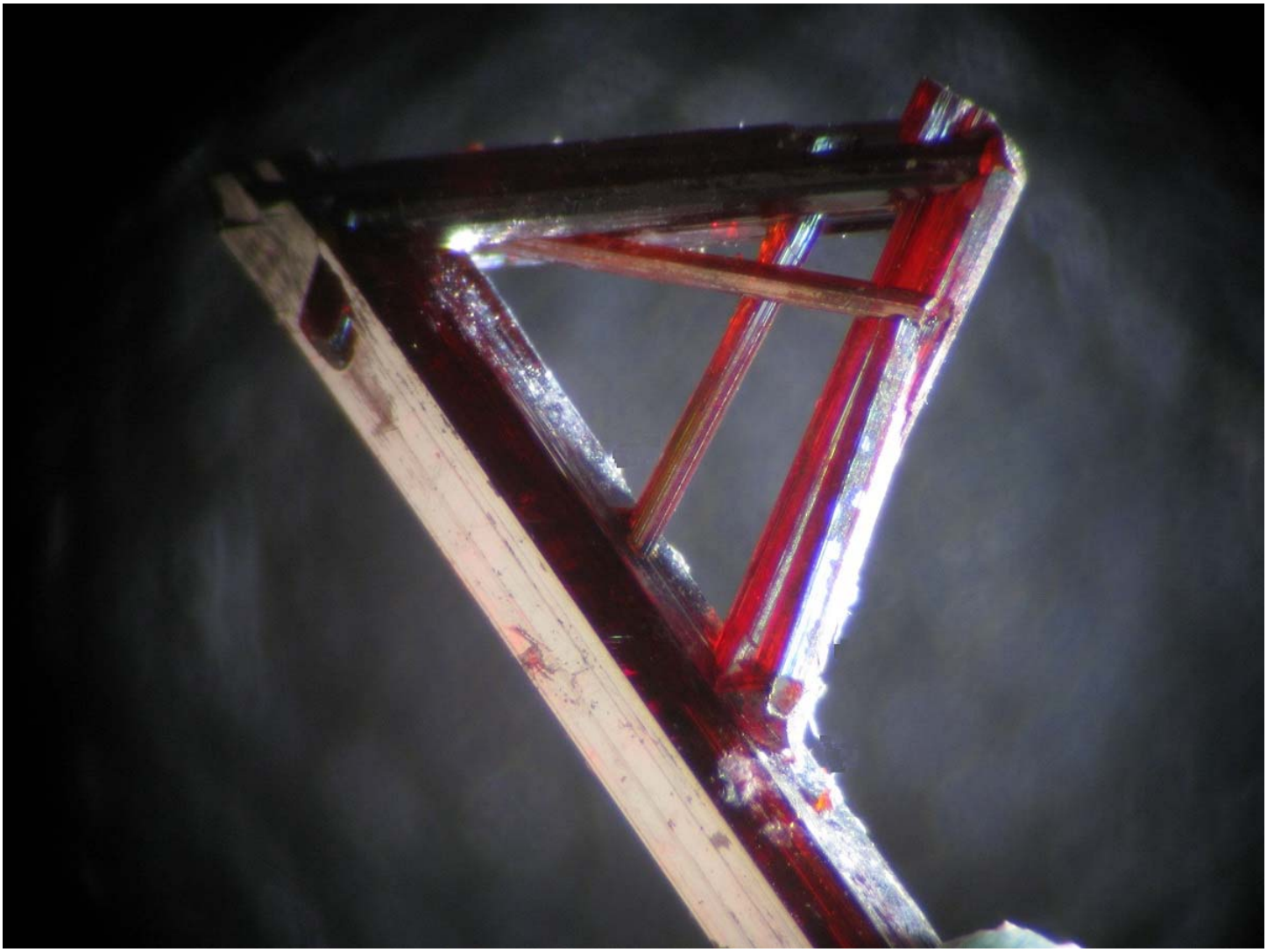
Bibliography

Branson Corp.: http://www.branson-plasticsjoin.com/how_tech_works.asp
Cleanosonic.com: Cleanosonic (Toll Free: 877-962-6847) is owned and operated by WA Brown, a Virginia Corporation, which distributes manufacturing, R&D and inspection equipment to government and industry nationwide.

Sonicor.com: toll free 800-864-5022, located in Connecticut, Sonicor has been designing and manufacturing Ultrasonic Cleaning Systems since 1966.
Wikipedia.com: http://en.wikipedia.org/wiki/Ultrasonic_cleaner
Tovatech.com: Tovatech, (973) 913-9734
Mindat.org: Mindat message boards.
Member discussions at the October Micromounters of New England monthly meeting.

Found on the Give Away Table

Tom Mortimer submitted this photo of a Hiddenite N.C. rutile specimen he found on the MMNE give-away table at the Oct. meeting. Thanks, Tom! What a beauty and a fantastic photo, too**!**



Harder Than The Hardest

by Andrew A. Sicree

Finding a perfect ten

Everyone knows that diamond is the hardest substance in the world, but sometimes something that everyone knows just isn't quite true. Diamond ranks as number ten on the Mohs scale of hardness, but the Mohs scale is only a relative scale. Friedrich Mohs chose diamond to be number ten on his scale because it was the hardest natural mineral substance he knew. Hardness on his scale is determined by scratching one mineral against another. Thus, calcite (H = 3) will scratch gypsum (H = 2) and talc (H = 1), but talc will not scratch either of the other two minerals. On the high end of the scale, diamond is harder than corundum (H = 9) and topaz (H = 8), but the gap between diamond and corundum is really much bigger than the gap between corundum and topaz. It takes correspondingly much more energy to scratch a diamond than to scratch corundum.

In the region between diamond and corundum, we find a number of harder synthetic materials and natural minerals. For instance, silicon carbide (SiC) is harder than corundum but softer than diamond. Hexagonal silicon carbide occurs naturally as the mineral rare mineral moissanite; it is found as tiny crystals in some meteorites.

Inventing carborundum

In 1893, Edward Goodrich Acheson patented a process for making synthetic silicon carbide grit, which he called "carborundum." Today, huge quantities of silicon carbide are produced synthetically and it is of major importance in the production of precision-ground interchangeable metal parts. Because it is harder than corundum and considerably cheaper than diamond grit, lapidaries and stonecutters have long used it as an abrasive, too.

Synthetic silicon carbide is opaque and very dark black in color. In recent years, the discovery of methods of making transparent, colorless silicon carbide crystals has opened up a new market for silicon carbide as a synthetic gem. This silicon carbide is sold as moissanite and is popular as a durable and flashy, but cheaper, diamond substitute.

Lonsdaleite and boron nitride

In the gap between corundum and diamond, scientists have long placed the rare mineral lonsdaleite and a substance called "wurtzite boron nitride." Like diamond, lonsdaleite is pure carbon, but lonsdaleite has a hexagonal rather than a cubic crystal structure (note that the mineral graphite is also a hexagonal polymorph of carbon, but lonsdaleite has a *different* hexagonal lattice). It is a very rare mineral. Small crystal blebs of lonsdaleite have been reported in some meteorites, and they are thought to have formed when a graphite-containing asteroid collided with another object (i.e., when it hit another asteroid or when it hit the Earth). Like graphite (hexagonal carbon), lonsdaleite is a polymorph of the mineral diamond. But unlike graphite, lonsdaleite is exceedingly hard – right up there with diamond.

Boron nitride has to be made synthetically. No one has found it in nature (yet!). It has simple chemistry, just boron and nitrogen. The interesting fact about born nitride is that it is "isoelectronic" with carbon, meaning that the electrons forming the covalent bonds in boron nitride are in essentially the same configuration as those in carbon. It implies that boron nitride should have many of the properties of carbon. And we find this is true.

Hexagonal boron nitride (h-BN) is very soft. This is analogous to the softness of hexagonal carbon (a.k.a. graphite). The cubic form of boron nitride (c-BN) has the same "sphalerite-like" structure of cubic carbon (a.k.a. diamond), and is correspondingly extremely hard. And, just as lonsdaleite is a very hard hexagonal form of carbon, so too there is a very hard hexagonal form of boron nitride. This hexagonal form of boron nitride has a "wurtzite-like" structure. Thus the name *wurtzite boron nitride* (w-BN) is quite appropriate.

How hard are they?

Mineralogists knew that both lonsdaleite and wurtzite boron nitride were very hard. But exactly how hard has been difficult to determine because nothing more than a few small flecks of either substance has been available. Hardness tests are very difficult to do accurately on very small specimens.

Scientists have thus turned to computer models. And they got some surprising results. According to the models used, wurtzite boron nitride is capable of withstanding 18% more stress than diamond is. (Measuring the stress necessary to damage the crystal

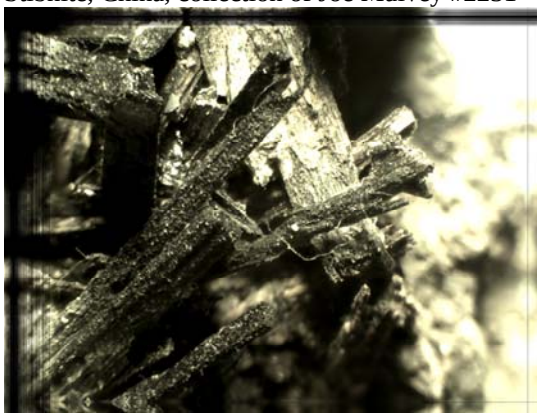
lattice or scratch a crystal gives a much more precise picture of the true hardness of that material.) And lonsdaleite is predicted to be capable of withstanding 58% more stress than diamond. This means that wurtzite boron nitride is harder than diamond and that lonsdaleite is harder than either wurtzite boron nitride or diamond. Thus, lonsdaleite is now the hardest known substance in the world.

Getting the computer to do for you what you cannot do in the lab is becoming more and more common. We can use computer models to determine everything from the location of an electron in a hydrogen atom up to rates of global warming. However, the question that must be asked of any model is "How well does this model reflect the reality in nature?" In the case of lonsdaleite and wurtzite boron nitride, proof will come when we get specimens large enough to test with precision hardness testers. Synthetically-made lonsdaleite will have to suffice if large natural crystals cannot be found.

Diamond is in many science books as the world's hardest substance. The day may soon come when we have to re-write those texts to include data on lonsdaleite and wurtzite boron nitride.

Black Swords from Japan

Glistening black swords of stibnite from Japan have haunted dreams of mineral collectors for the past century. The Ichinokawa Mine in Japan's Ehime Prefecture closed more than 50 years ago and in spite of the newer production of large bladed stibnites from Chinese mines, the Japanese stibnites remain among the world's mineral classics.



Stibnite, China, collection of Joe Mulvey #2231

Stibnite has been utilized for millennia. Ancient Greek and Roman authors such as *Pedanius* Dioscorides (circa 40—90 AD) and *Gaius Plinius Secundus* (23 AD – August 25, 79 AD), better known as *Pliny the Elder*, referred to stibnite as *stibi*, *stimmi*, or *platyophthalmon*. The term platyophthalmon alludes to the popular use of powdered stibnite, which looks black, as a cosmetic for darkening the eyebrows to make ones' eyes seem larger.

Stibnite, an antimony sulfide (Sb_2S_3, orthorhombic) sometimes known by the alternative name antimonite, can occur as long thin striated crystals with sharply pointed ends. Fresh crystals have a black steel luster, making the sword analogy complete. After prolonged exposure to light, the surfaces of stibnite crystals tend to dull.

Somewhat fantastically, some authors have reported that Japanese gardeners, living in the vicinity of the mines, used meter-long stibnite crystals not as swords (in reality they would shatter if struck), but rather as plant stakes or as fence posts in miniature gardens.

An unusual property of stibnite is the development of "kinks." Natural crystals sometimes display a bend or kink in an otherwise straight crystal. It is possible to create these kinks yourself. Hold a small crystal pinched between the thumb and forefinger of each hand, then apply a firm but gentle shearing force to the crystal. You'll feel the crystal move slightly and you'll see that a kink has developed in the crystal. Don't try this with an expensive specimen as the kink cannot be reversed and any attempt to straighten the kink may result in the crumbling of the stibnite crystal.

The World's Oldest Amber

Scientists recently discovered some of the world's oldest amber in 320-million-year-old coals from Illinois. This amber has only been found in small blebs about one-quarter of an inch (5 mm) across, but analysis of the amber yielded some surprising results.

Amber from the Dominican Republic is about 30 million years old. The world's largest sources of amber are the shores of the Baltic Sea; ambers from there are probably about 42 to 54 million years in age. New Jersey amber ranges approximately 65 to 95 million years old. Amber from Lebanon goes back nearly 130 million years. The Illinois ambers were found in coals from the Tradewater formation, Pennsylvania-age rocks about 320 million years old.

Amber forms from fossilized tree resins. Trees produce resins to seal damage and to protect themselves against insect invasions and to discourage animals from chewing on them. We are familiar with the dark reddish-brown resins that ooze from the barks of conifers and other gymnosperms – it sticks to your hand and is almost impossible to wash off. Gymnosperms are trees that have

"naked seeds," and the group includes trees such as pines, firs, spruces, and ginkos. Other trees are angiosperms (flowering plants with encased seeds, including trees like apple, maple, and oak). They also can produce ambers. It is possible to identify various types of ambers using a process called pyrolysis-gas chromatography-mass spectro-metry (Py-GC-MS). Put simply, this process takes a sample of amber, burns it to break it down, separates the chemicals produced during the break-down, and then identifies the break-down chemicals. Ambers from gymnosperms and angiosperms will produce different patterns of break-down chemicals and so we can distinguish them.

Analysis of the Illinois ambers revealed that they belong to the class "1c." Ambers in the "1b" class are the most common, and they are thought to form from tress like conifers (gymnosperms). Class 1c ambers are usually thought to come from angiosperms. The problem with the 320-million-year-old Illinois ambers is that they are in class 1c (angiosperms), but angiosperm plants don't arise in the fossil record until almost 200 million years later. (Plants that formed Pennsylvania age coals were not like those in modern-day forests; there were no grasses and no flowering trees; ferns and fern-like plants predominated.) This class 1c amber puzzle leads scientists to suspect that at least some early plants growing in the coal swaps of the Illinois Basin had resin-making abilities similar to those of modern-day flowering trees.

Ref.: Bray, P. S., and Anderson, K. B., 2009, "Identification of Carboniferous (320 Millions Old) Class 1c Amber," *Science*, v. 326, 2 Oct. 2009, p. 132-134.

MMNE SECRETARIAL REPORT for October 16, 2010

President Joe Mulvey brought the October meeting to order at the Chelmsford Trinity Lutheran meeting location at approximately 11:00 AM. Nine members were present.

The first portion of the meeting was non-business-related and consisted of a variety of demonstrations and conversational issues of interest.

- Joe displayed how he had up-dated the club logo.
- He showed images of the only two Columbite/Tantalite specimens submitted for this month's competition.
- There was further information from Mindat regarding last month's discussion of "Super Ironout" and of the "Waller" method for cleaning minerals.
- There was a general discussion regarding ultrasonic cleaners.
- Joe displayed further photos of Babingtonite.
- Nate Martin reported that his NH and Trumbull, CT Milarite specimens indeed fluoresce **only** in mid-range UV light. He said many (but not all) other international samples do also. He also said that he would like to know what the "activator" for fluorescence is. Bob Janules suggested he would likely need a microprobe analysis to determine this.

(The following business portion of the meeting was very brief due to low turnout and the lack of a quorum.)

Joe suggested that the January 22 MMNE meeting be moved due to a conflict with the Boston Mineral Club Mineral Sale being held that same date. There was no opposition but no vote occurred.

There was consensus that the there would be a formal vote to change the May Symposium date to June 11 at the November 20 MMNE meeting. Members also agreed that there should be a regular club meeting at Trinity Lutheran for May.

Nate Martin said that he had a small number of 20x lighted loupes available for $15 each.

Joe Mulvey suggested that a club meeting might be scheduled to meet at Harvard so as to view the College's micro collection. Other members suggested that the club should consider inviting Carl Francis as a speaker.

New Hampshire Species Specialist and MMNE Treasurer Tom Mortimer also is the owner of MindatNH.org, the ultimate resource of New Hampshire minerals.

Members agreed that the Childrenite/Eosphorite group of phosphates would be the November mineral of the month.

The meeting adjourned at approximately noon.

Respectfully submitted,
Recording Secretary
Bob Wilken

Chile's Newest National Heroes are From the United States


Image from Center Rock website

Did you know?

The guy that designed the rescue module was a NASA Engineer?

The Drill was made by Schramm Inc. from Pennsylvania. http://www.schramminc.com/

The Drill Bits were made by Center Rock, Inc. located in Berlin, Pennsylvania. http://www.centerrock.com/

The lead driller Jeff Hart and his team are from Denver, Colorado. They are on loan from the US Military in Afghanistan where they are drilling water wells for our Forward Operating Bases. He spent the next 33 days on his feet, operating the drill that finally provided a way out Saturday for 33 trapped miners. "You have to feel through your feet what the drill is doing; it's a vibration you get so that you know what's happening," explained Hart.

Hart was called in from Afghanistan, "simply because he's the best" at drilling larger holes with the T130's wide-diameter drill bits.


REAL HEROES: US drill operators Jeff Hart, left, and James Staffel wave as the T-130 drill that made the hole reaching the 33 trapped miners is transported away from the San Jose mine near Copiapo, Chile, on Monday. The engineer leading Chilean rescue efforts, Andres Sougarett, said Monday his team has successfully tested a rescue capsule nearly all the way down to where 33 miners are trapped. The miners became trapped when the mine collapsed on Aug. 5. (AP)

Standing before the levers, pressure meters and gauges on the T130's control panel, Hart and the rest of the team faced many challenges in drilling the shaft. At one point, the drill struck a metal support beam in the poorly mapped mine, shattering its hammers. Fresh equipment had to be flown in from the United States and progress was delayed for days as powerful magnets were lowered to pull out the pieces.

The mine's veins of gold and copper ran through quartzite with a high level of abrasive silica, rock so tough that it took all their expertise to keep the drill's hammers from curving off in unwanted directions. "It was horrible," said Center Rock President Brandon Fisher, exhausted after hardly sleeping during the effort.

Hart and his team called it the most difficult hole they had ever drilled, because of the lives at stake.

"If you're drilling for oil and you lose the hole, it's different. This time there's people down below… We ruined some bits, worked through the problems as a team, and broke through," Hart said. "I'm very happy now."

Miners' relatives crowded around Hart on Saturday, hugging and posing for pictures with him as he walked down from the rescue operation into the tent camp where families had anxiously followed his work.

"He's become the hero of the day," said Dayana Olivares, whose friend Carlos Bugueno was one of the miners stuck below.

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Childrenite-Eosphorite Series

Childrenite is the Fe^{2+} analogue of Eosphorite.

Eosphorite is the apparent Mn2+ analogue of Childrenite.

Type Locality of Childrenite is Tavistock District, Devon, England, UK. Type locality of Eosphorite: Abija N. Fillow Quarry (Branchville Quarry), Branchville, Redding, Fairfield Co., Connecticut, USA

Childrenite is a rare hydrated phosphate mineral with elements iron, manganese, aluminum, phosphorus, oxygen and hydrogen. Chemical formula is $(Fe,Mn)AlPO_4(OH)2 \bullet H_2O$ and it has a molecular weight of 229.83 g/mol. Its specific gravity is 3.2 and it has a Mohs hardness of 4.5 to 5. It is usually translucent and non-fluorescent, with imperfect cleavage. It has a vitreous lustre with a white streak, and is brown or yellow in color. It has a conchoidal, uneven fracture, and an orthorhombic crystal system.

Relationship to other species

Found in complex granitic pegmatites, it is a low temperature hydrothermal alteration product of primary phosphates. Childrenite-Eosphorite is typically associated with Siderite, Quartz, Pyrite and Fluorapatite. With eosphorite, childrenite can form a solid solution series.

The chemical composition of eosphorite only differs by being rich in manganese and not in iron. The two mineral's structures are the same, and differences in properties can be traced to the iron/manganese percentage. Of the two, childrenite is denser. Furthermore, eosphorite is normally pink in color, which can be attributed to manganese.

Childrenite

History and formation

Childrenite was discovered in 1823 by John George Children (1777 - 1852), who was a prominent English chemist and mineralogist (see sidebar). This secondary mineral was first found in the George and Charlotte Mine near Tavistock in Devon. Its formation is probably from the alteration of granitic phosphates like lithiophilite and triphylite. Childrenite is also found in some ore veins.

November Mineral Competition: Childrenite-Eosphorite

Childrenite : $(Fe^{2+},Mn^{2+})Al[(OH)_2|PO_4] \cdot H_2O$,
Fluorapatite (Var: Carbonate-rich Fluorapatite) : $Ca_5(PO_4,CO_3)_3(F,O)$

Locality: Palermo No. 1 Mine (Palermo #1 pegmatite), Groton, Grafton Co., New Hampshire, USA Field of view ~ 1.6 mm

Physical Properties of Childrenite

Lustre: Vitreous, Resinous
Transparency: Transparent, Translucent
Colour: Yellowish brown, brown, clove-brown; colourless in transmitted light.
Streak: White
Hardness (Mohs): 5
Cleavage: Poor/Indistinct, Poor on {100}
Fracture: Irregular/Uneven, Sub-Conchoidal
Density (measured): 3.11 - 3.19 g/cm3

Crystallography of Childrenite

Crystal Data: Orthorhombic; probably monoclinic, pseudo-orthorhombic. *Point Group:* *2/m 2/m 2/m.* As equant to pyramidal crystals, may be short prismatic along [001], thick
tabular on {010}, or platy on {100}, commonly doubly terminated, to 2 cm; in radiating groups
and fibrous crusts; massive. *Twinning:* May show twinning on {100} and {001}, observed
optically, to give pseudo-orthorhombic symmetry; may be due to oxidation.
Crystal System: Orthorhombic
Class (H-M): mmm (2/m 2/m 2/m) - Dipyramidal
Cell Parameters: a = 10.41Å, b = 13.42Å, c = 6.92Å
α = 90°, β = 90°, γ = 90°
Ratio: a:b:c = 0.776 : 1 : 0.516
Unit Cell Volume: V 966.74 Å³ (Calculated from Unit Cell)
Morphology: Equant to pyramidal crystals, short prismatic [001], tabular, platy, radiating groups, fibrous crusts, massive.
Twinning: May show on {100} and {001}.
Comment: Probably monoclinic, pseudo orthorhombic

Fe++Al(PO4)(OH)2•(H2O)

Composition:	Molecular Weight = 229.83 gm		
Aluminum	11.74 %	Al	22.18 % Al2O3
Iron	24.30 %	Fe	31.26 % FeO
Phosphorus	13.48 %	P	30.88 % P2O5
Hydrogen	1.75 %	H	15.68 % H2O
Oxygen	48.73 %	O	
	100.00 %		100.00 % = TOTAL OXIDE

John George Children (1777–1852), English chemist and mineralogist.

John George Children (18 May 1777 – 1 January 1852 in Halstead/Kent) was a British chemist, mineralogist and zoologist.

Children studied at Queens' College, Cambridge. In 1822 he was working as a librarian in the Department of Antiquities at the British Museum when he was appointed assistant keeper of the Natural History Department in succession to William Elford Leach. The appointment was controversial as he was less qualified than another applicant, William John Swainson. After the division of the Department into three sections in 1837 he became keeper of the Department of Zoology, retiring in 1840 and succeeded by his assistant John Edward Gray.

Children was made a fellow of the Royal Society in 1807, and served as the society's secretary in 1826, and from 1830 to 1837.

In 1833, he was founding president of what became the Royal Entomological Society of London.

His name is commemorated in the Australian Children's python, Antaresia childreni, the Australian stick insect Tropidoderus childrenii, and the mineral childrenite. John James Audubon named a warbler after him, but the specimen turned out to be a juvenile Yellow Warbler.

His daughter was Anna Atkins, a botanist, and who is best-known for her book of cyanotype photograms of algae, the first book of exclusively photographic images ever made.

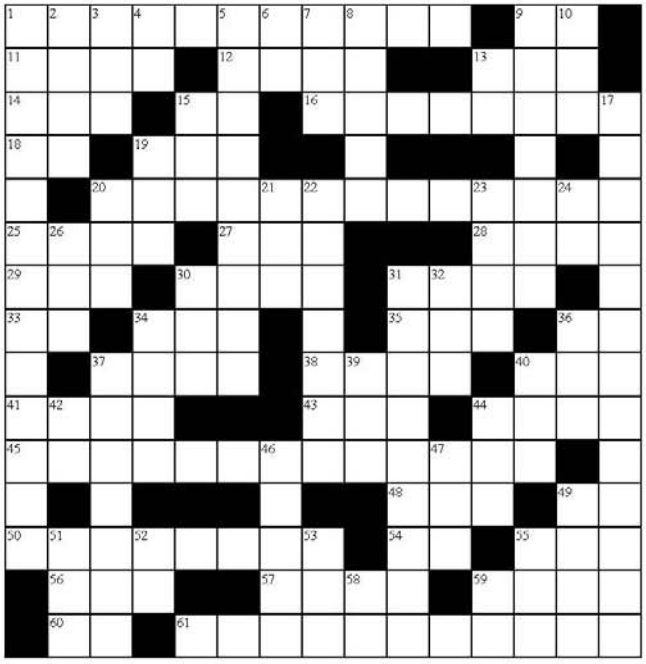
http://en.wikipedia.org/wiki/John_George_Children

Resources:

Mindat.Org;
MindatNH.Org
Wikipedia.Org
Brooke H J A (1823) On some undescribed minerals. Childrenite, The Quarterly Journal of Science, Literature, and the Arts 16, 274-277
Giuseppetti G, Tadini C (1984) The crystal structure of childrenite from Tavistock (SW England), Ch89Eo11 term of childrenite-eosphorite, Neues Jahrbuch für Mineralogie, Monatshefte 1984, 263-271
Hurlbut C S (1950) Childrenite - eosphorite series, American Mineralogist 35, 793-805

Crystal Matrix Crossword

Arsenic



ACROSS

1 orpiment _____ realgar
9 metal that melts in your hand
11 composed of mineral grains
12 Brits call it a bonnet
13 source of fine adularia
14 when I dropped my crystal I was ___
15 dawn, early
16 more than one arsenic sulfides
18 Lord or God
19 after your money
20 killed off by arsenic
25 low, woody, and windy
27 Chinese name
28 geological (ab)
29 edible fish
30 worse than a dam
31 not a paddle but they're ours
33 lanthanum
34 part of rock drill
35 good ___ now, ya'll
36 __, that stinks
37 used to drop into mine
38 inside a tire
40 water, salt, and gypsum
41 today, maybe in a minute
43 Zambezi Resources Ltd.
44 covered with native gold
45 iridium ruthenium arsenide minerals (pl)
48 tree resin
49 state for quartz
50 copper arsenic sulfide
54 washboard muscle
55 Star Wars
56 the ___ Khan
57 better than a little
59 the play's the thing
60 found with sphalerite
61 iron arsenide

DOWN

1 manganese arsenate
2 black organic roack
3 charge coupled device
4 Okie state
5 zinc arsenate hydroxide
6 giant mythological Chinese turtle
7 neither this ___ that
8 an unchipped crystal
9 arsenolamprite and galena are arsenic and lead ___
10 the fourth month (ab)
13 element that tarnishes
15 division of geologic time
17 palladium arsenide
19 end of the mineral
20 found covering rocks
21 done while cleaning your crystals
22 ancient Chinese river
23 mean guy
24 found in carrollite
26 a main squeezer
30 best way to find rocks
31 indispensable music
32 roger
34 what agate has
36 skinny but not a snake
37 made from Cu, Ag, Au
39 place for ashes
40 your sister
42 either ore or __
44 fine hard stone
46 gecko foot hairs
47 place to wash minerals
49 mine entrance
51 an old horse
52 radium
53 nickname for Ellen
55 on water or snow
58 __ Miss
59 Singapore (ab)

LAST MONTH'S SOLUTION: Not Quite

S	E	D	I	M	E	N	T	A	R	Y	■	V	T	■
E	O	N	S	■	X	R	A	Y	■	■	P	E	N	■
I	N	A	■	B	C	■	X	E	N	O	L	I	T	H
S	S	■	S	E	A	■	■	A	■	■	■	N	■	I
M	■	A	A	■	L	A	U	R	I	O	N	I	T	E
O	K	L	O	■	I	L	R	■	■	■	O	N	E	R
L	I	E	■	A	B	B	A	■	T	T	A	G	■	O
O	N	■	S	T	E	■	N	■	R	A	H	■	E	G
G	■	D	O	E	R	■	I	L	E	T	■	D	B	L
I	D	E	A	■	■	■	U	L	A	■	R	U	B	Y
C	O	C	K	S	C	O	M	B	S	■	A	G	■	P
A	■	I	■	■	■	P	■	■	U	M	P	■	O	H
L	A	M	E	L	L	A	E	■	R	A	■	M	I	I
■	A	A	A	■	■	L	Y	M	E	■	T	A	L	C
■	F	L	■	R	E	S	E	A	R	C	H	E	R	S

Looking for a good home: Scientific American magazines available

I have about 260 back issues of Scientific American magazine for anyone who would like them, (free).
The issues span from mid sixties to 2004.
Lots of interesting articles on science topics.
Please contact Tom Mortimer if interested.
(603) 673-4039 or tjmort@comcast.net

After the November MMNE meeting…

The Worcester Mineral Club Annual Show

The centerpiece of the club's year is our annual show held in November. The show provides members and the general public an opportunity to purchase gems, jewelry, fossils, minerals, lapidary, and related publications and equipment.

The show features dealers with a wide range of material from children's and beginner lever items to advanced collector's items. Prices range from less than a dollar to hundreds of dollars.

November 20-21, 2010 **Worcester, MA** Worcester Mineral Club. Saturday 10am to 5pm and Sunday 10am to 4om at National Guard Armory, 701 Lincoln Street, Worcester, MA Take I-290, exit 22, Main Street Shrewsbury towards Worcester, through light, up hill, armory and parking lot on left. Contact: WMC, P.O. Box 2278, Worcester, MA 01613 413-477-0107

Tell them the MMNE sent you!

January Meeting Delayed for BMC Annual Auction

The January Micromounters meeting will be held of Saturday, January 22 instead of the third Saturday to accommodate our members attendance at this super, traditional, annual auction. Always exciting, there is something for everyone at this day-long event. Visit the Boston Mineral Club for more details as the day nears. http://www.bostonmineralclub.org

2011 AFMS Website Contest by Phyllis George

This is the third year for the AFMS Web Site Contest. I hope that word about the contest is growing and that we'll have even more entries in the 2011 contest. The primary value of this contest lies in the comments that each judge writes as he or she goes through the Web site looking for the items listed on the Score Sheet. The judges are instructed to identify what the site does well as well as to comment on what can be done better. The goal of the contest is to help the Web sites better serve their clubs. Two judges will be assigned to each regional competition (their scores for each contestant will be averaged) and one judge (Wes Lingerfelt) is assigned for the AFMS level. Each judge probably will be judging two different regions, but no judge will judge his or her own region. Right now I have a total of eight regional judges. If I can get another six judges, each judge will judge only one regional federation.

Editor's Note: Once again, I am a judge for the Rocky Mountain Federation website contest. JM

Directions to the Trinity Lutheran Church in Chelmsford, MA

170 Old Westford Rd., Chelmsford, MA.
From Rt. 3, take Exit 32, (The “Drum Hill Rotary”).
From Rotary, Take Old Westford Rd. towards Westford for about .85 miles to Grandview Rd.
Entrance for Trinity Lutheran Church on left.
Proceed up rather long driveway to parking area.
Our meeting room is at the far end of the low building.

Those coming from the south may want to try an alternate route, exiting from Rt. 495 at Exit 33, then taking Rt. 4 north to a left onto Davis Rd. See map below.

Fall Meetings are at Trinity Lutheran Church in Chelmsford, MA. Meetings start at 9am and wrap up around noon.

November 20

No Meeting in December

January 22, 2011

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Membership in the MMNE runs from January 1st to December 31st. Dues are payable on or before January 1st for the upcoming year. Failure to renew on time will result in cancellation of membership including the subscription to the Newsletter. Please fill out this form and return it with your payment.

Name: _____

Street/PO Box Address: _____

City/State/Zip : _____

Telephone: _____E-mail address: _____

___ Hard copy via USPS or ____ via email to above address

Membership type: Individual $ 12.00 Family $ 16.00
Family membership includes two adults residing at the same address and all children at that address under the age of 18. Only one copy of the Newsletter per family membership.
Newsletter: The Newsletter is available as hard copy sent through the mail, or via email, which may have color photographs included. Please indicate choice of format. The Newsletter is published in January, February, March, April, May, Summer Issue (June), September, October and November (no December issue), and is send out approximately two weeks prior to the next scheduled meeting.
Please remit payment to Treasurer Tom Mortimer, 3 Roberts Rd., Amherst, NH 03031

Joe Mulvey, Newsletter Editor
Micromounters of New England
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Nashua, NH 03062

TO: