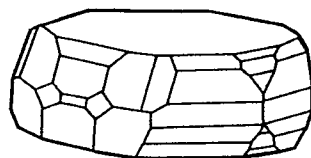
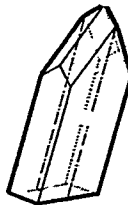
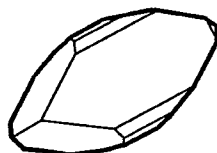
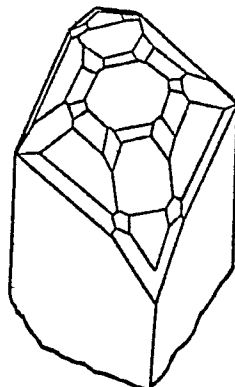
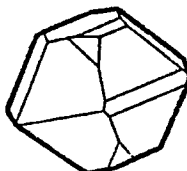
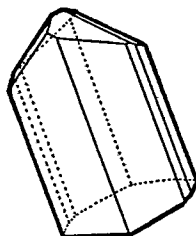
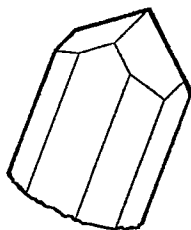


\$2.00



# MICROMOUNTERS OF NEW ENGLAND



## NORTHEAST MEETING

May 2, 1987

•  
4-H Conference Center  
Ashland, MA

### PROGRAM

9:00 Registration & Informal Session  
12:00 Lunch  
1:00 Presentation:

### THE MINERALOGY OF MONT ST-HILAIRE

by  
Dr. Joseph A. Mandarino

2:00 Door Prize Drawings

4:00 Departure

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President — Frank Leighton

Vice President — Neil Briggs

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Secretary — Betty Sevrens

Treasurer - Mrs. Janet Cares

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Newsletter Editor - Mrs. Shelley Monaghan

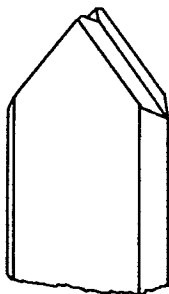
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Additional Information —

Mrs. Janet Cares, 18 Singletary Lane, Sudbury, MA 01776 • (617) 443-9180

GUEST SPEAKER: Dr. Joseph Anthony Mandarino  
Royal Ontario Museum  
100 Queen's Park  
Toronto, Ontario  
Canada M5S 2C6

"Joe" was born and educated in Michigan, where he received his PhD from the University of Michigan. Since 1959 he has been at the Royal Ontario Museum where he is presently Curator of Mineralogy. His many descriptions of new minerals qualify him well for his position as Chairman of the Commission on New Minerals and Mineral Names of the International Mineralogical Association. He is a Fellow of the Mineralogical Society of America, and is Past President of the Mineralogical Association of Canada, as well as the Walker Mineral Club of Toronto. One of Joe's special interests is the Gladstone-Dale relationship, which correlates chemical, optical, and physical properties of minerals, and on which he has written several widely quoted papers. Of late he has been occupied with writing a book, illustrated by Violet Anderson's photographs, on the mineralogy of Mont St-Hilaire, Quebec, which is the subject of his presentation. He and his wife, Joan, have two daughters and two sons, all in their twenties.



Mandarinoite

## MICROMINERAL PHOTOGRAPHY

Frank Leighton

A very pleasurable partner to mineral collecting is the photographing of our best and most colorful specimens. In my case I often wonder where one begins and the other leaves off.

I do not use my microscope to do micro photography as I do not have any attachments for my microscope. However I do have a Nikkormat camera and a Nikon bellows attachment. This allows me to obtain the same results up to 10 diameters enlargement of my micro specimens, which when projected upon a screen gives me very fine results.

Look through the different types and means of making slides or prints of your favorite mineral specimens as shown below and, after equipping yourself, use the formulas as shown for determining your flash distance and f stops.

1. Extension tube sets- (they come in several lengths)  
These go between the camera body and the prime lens.
2. Tele-converters (2X doubles the image, 3X triples it)  
These go between the camera body and the prime lens.
3. Macro-Focussing Lenses (same 50mm lens as your standard lens, but has a bellows-like extension feature)  
These attach to the camera body in place of the standard prime lens.
- 4: Bellows (It comes on a rack and pinion track)  
It goes between the camera body and the prime lens.

An extension tube is used with lenses that don't contain built-in extension devices to bring the prime lens closer to the object. An inexpensive set may cost only \$25 to \$30; a top of the line set \$90 to \$100. They can be unwieldly.

The most generally useful add-on lens is the tele-converter, a multi-element lens that fits between the camera body and the prime lens. Its effect is to magnify the prime lens image to an amount equal to the power of the converter.

Because it replaces your regular lens and is designed for close-up work, a macro lens will give you sharper pictures than an extension tube set will, but at a steeper cost (\$200 to \$400). Its optical secret is a flatter than normal lens surface. A \$5 to \$10 ring adapter will approximate the same effect by letting you reverse your regular lens so its flat surface faces outward, but you can't really duplicate the macro's convenient built-in extension device.

Like an extension tube, a bellows moves your lens closer to the specimen. It reaches farther, is easier to use, but is more costly, \$200 to \$300.

I use only 25 ASA rated film. The slower the ASA rating the color film is, the finer the grain (sharper image) and more control is obtained. Don't worry about the color balance of your slides or prints. The electronic flash is balanced for outdoor color film. Be sure you use only this type of film with electronic flash.

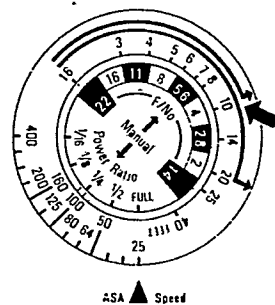
One good hint- your 35mm camera probably has a mirror release button. After you are through focusing, turn the mirror up out of the way, otherwise when the shutter is released a small "mirror bounce" occurs. It could cause unsharp slides.

And, lastly, use a cable release to trip the shutter. A heavy finger on the shutter release can be a disaster.

WHEN YOU USE FLASH, DISTANCE IS CRITICAL. HERE IS HELP

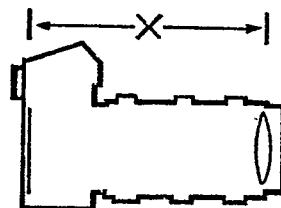
When you take flash close-ups, it's vital to hold the flash at precisely the correct distance. Use the formula outlined here to determine that distance. (The formula is based on a fully charged flash, so wait until yours is ready before you start to shoot. Also make sure your flash is synchronized with the camera's shutter. The formula has five steps:

1. Determine the guide number of your flash unit. To do this set the flash unit for the ASA number of your film. We are using color film with an ASA rating of 25. Multiply any one of the unit's listed distances by its recommended f stop. (On our unit for an ASA of 25, a distance of ten feet requires an f stop of f/4; so  $10 \times 4 = 40$ , and that's our guide number)



2. Next, select the f stop to use. With a flash you can use a small aperture such as f/11 or f/16 for a greater depth of field. We'll use f/16 in our example.

3. Now measure the lens to film distance in millimeters. Most cameras have a line (on some it's simply the serial number; check your owner's manual) that tells where the film plane lies. Measure from that line to the center of the lens. The greater the distance, the closer you can get to the subject and the larger the film image will be. (For our camera, the distance was 150 mm)



4. Figure your effective f stop. The formula (with our numbers in parentheses to serve as examples) is:

$$\frac{\text{Lens-to-film distance}(150\text{mm})}{\text{Focal length of lens } (50\text{mm})} \times \text{f stop}(16) = \text{Effective f stop}(48)$$

5. Now find your flash distance in inches:

$$\frac{\text{Guide number (40)}}{\text{Effective f stop (48)}} = \text{flash distance (10 inches)}$$

That's how far from the crystals you should hold the flash unit.

For those who wish to do serious work in close up photography of minerals, may I suggest the following:

Lepp & Associates, P.O. Box 6240, Los Osos, CA 93412  
(all manner of camera attachments, plus flash equipment)

For additional reading:

"Field Photography" (Beginning and advanced techniques) \$19.95  
by Alfred A. Blaker. W.H. Freeman & Co., San Francisco, CA  
"The Manual of Close-Up Photography" \$19.95 by Lester Lefkowitz,  
Amphoto, New York, NY

Space prohibits me from doing more than creating an interest in close-up photography, which I hope I have done here.

So, go for it. I hope this will be of help, and good luck.

As a former commercial photographer, Frank naturally turned to this aspect of mineral study. He enjoys the outdoors aspect of collecting and the people he meets in the hobby of micromounting. His special interests are in the minerals of Mont St-Hilaire and Francon. For the past year he has been President of the Micromounters of New England.



"WHEN WE GO AFTER MICROS, WE DON'T FOOL AROUND!"

## INCLUSIONS IN HERKIMER "DIAMONDS"

Dana Morong

As most know, Herkimer 'diamonds' are those beautiful and euhedral quartz crystals from the Herkimer area of New York state, nicknamed 'diamonds' for their limpidity and equant morphology, the 'r' faces being at least as dominant, if not more so, as other faces. Due to their clarity, one may at times discover inclusions within them, these being still collectable.

Many crystals contain gas or fluid inclusions, usually too small to be seen with low-power microscopes, but causing veiling or turbidity in crystals. This is uncommon in Herkimer quartz but very common in milky quartz. Usually, however, when we speak of inclusions we mean those more easily visible, at least microscopically, a few microns as a minimum size.

Gas or liquid inclusions are necessarily enclosed in cavities. These may be produced by the entrapment of fluids or gases during early stages of crystal formation, or more commonly by fractures which were subject to partial recrystallization so that the present cavities are more equant, subsequently being sealed off in the last stages of mineralization. Often these cavities are bounded by crystal faces reflecting those of the host crystal, this change from irregular to regular forms being due to various crystallizing forces, yielding these euhedral cavities that we call "negative" crystals. Negative crystals usually resemble the host crystal and can form the most intricate and neat patterns (Roedder, 1962).

The crystal axes and respective faces of negative crystals are always aligned in parallel to their host's axes and faces, but may still occur in odd shapes, with different sets of faces being dominant in different specimens. Often they appear elongated parallel to a nearby host crystal face, or one may change its direction of longest dimension and thus be angled, though still in parallel with its host. It is interesting to view such orderly and geometrically aligned cavities and patterns.

Not all negative crystals are as well-formed as the tiny ones along former fractures. Some have not been completely "faced" and so exhibit remnants of their former bubble forms, or may be cavernous on a side. Although scepter Herkimers are known, I have never seen a negative scepter crystal, but it's a possibility and hence should be looked for.

Moveable bubbles are the more popular and better known of inclusions. These are gas bubbles within a fluid (usually of some saline solution) which, when tipped, react predictably by floating to the top of their prison. There is little that is popularly written on the formation of moveable bubbles. For a readable and detailed explanation, the article by Roedder (1962) is highly recommended. As to the availability of moveable bubbles, they are uncommon, but can still be occasionally found along with other Herkimer crystals, if one has a sharp and persistent eye for such things.

Occasionally some cavities are nearly filled with what appears to be a large bubble which does not move upon tilting. By turning the specimen and so reflecting light off this inclusion, one may see all its faces, but the bubble remains stationary. Speculating as to its cause, this could be a gas bubble in a liquid, but much too "caught" by the sides of its cavity and by its own surface tension (thus keeping its shape) to permit any appreciable movement.

Solid inclusions are most commonly represented in Herkimer 'diamonds' by anthraxolite, a brown to black hydrocarbon. When a loose piece is found in a cavity or negative crystal along with a moveable bubble, it's called a three-phase inclusion (solid, liquid, and gas). A curious story I've heard concerns such an assemblage that a fellow was showing to others. A small bit of anthraxolite stuck to the bottom of the bubble and thus slowly rose with it whenever turned over. Much to the fellow's surprise, when the crystal warmed enough by the heat of his fingers, the solid instead would drag the bubble down with it to the bottom of the cavity! The heat must somehow have altered the solubility of the gas in the fluid and thus changed the bubble's size or bouyancy; an unusual occurrence when the deciding temperature is so close to the human level!

Usually anthraxolite occurs as irregular masses within the crystal, but phantoms caused by thin coatings on earlier growth stages, and fine disseminations causing a "smoky" tint are not uncommon. Quite a bit of good information on the formation, properties, and occurrences of this carbonaceous material is included in the article by Tuttle (1973).

Rarely, instead of anthraxolite, or in addition to it, a tiny crystal (usually a chloride of sodium or of potassium) occurs as the solid in the fluid of the cavity. The composition of such crystals, along with hints about the enclosing solution, can sometimes be determined by morphology and by optical means. Most of the fluids are either water or saline solutions, though sometimes they are liquid carbon dioxide. The gas is usually either water vapor or carbon dioxide (with Herkimers, this may have come from carbonate of surrounding country rock; see also Roedder (1962). Fluid inclusions can be helpful to professionals in determining the paragenesis of quartz crystals. The author points to Frondel (1962) for more information, and to the article by Jones (1976) which explains this as well as other characteristics of Herkimer quartz.

Examining quartz (especially Herkimers) under high power may turn up other inclusions. Colorless and clear rhombs of dolomite are not too uncommon within Herkimer "diamonds," and flesh-colored dolomite has also been reported as an inclusion. Other solids reported are pyrite, siderite, limonite, hematite, and sphalerite (Ulrich, 1971). Other solids, though not considered as foreign inclusions as they are the same species and orientation, are the smoky phantoms found in this material. And of course there are the innumerable smaller crystals situated on and partly intergrown upon faces of larger crystals.

Most unusual and perhaps the least known are the inclusions of quartz within quartz. This happens when one crystal has completely enclosed another, and though they are the same species, the included crystal is not crystallographically parallel (as phantoms are), but is situated at a completely askew angle from the host's axial direction. This is usually nearly invisible, even with magnification, as both inclusion and host have identical refractive indices (fluids have different indices from the quartz, thus can be easily seen). If one gets the light right, one can sometimes see some faces, probably due to internal reflection or maybe impurities at the interface. Optical testing with polarized light would show up unconformities due to differing orientations of optical axes. Sometimes fractures extend out from these crystals.

Some of the most interesting of the quartz inclusions are when the tiniest negative crystals are situated on the planes of some faces of our included crystal, and are aligned in parallel with the host crystal, even though the quartz inclusion itself is askew and not aligned at all. Some faces have no negative crystals to delineate them and hence are invisible, but can be "seen" by inference. Megascopic examples of this are rare.

In my opinion, the planes of tiny and multitudinous negative crystals, where fractures once existed or where fluids once got caught, are the most interesting inclusions, especially as they may delineate interfaces of some included quartz crystals. But whatever type of inclusion the collector finds or studies, he must be most careful to label them not just as to locality, but also as to unusual characteristics which may not be readily conspicuous upon casual viewing. With liquid inclusions, be sure to keep these from either overheating or freezing with consequent damage. There is undoubtedly much to be discovered in the field of inclusions, and perhaps the learning and appreciation of them is worth more than the knowledge itself, though many bits of knowledge may add up to a better understanding of various mineralogical processes. They certainly are interesting viewed under the microscope!

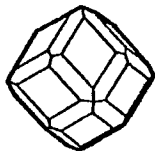
Dana particularly enjoys field collecting at New England localities, and identifies his finds by chemical and physical tests. He has written and published a booklet entitled "New Hampshire Mineral Collecting Localities".

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## GARNET — THE CONNECTICUT STATE MINERAL

Jim Grandy

On June 2, 1977 Connecticut Governor Ella Grasso signed the bill naming the Garnet as the state mineral. As chairman of this Connecticut Council of Mineral, Lapidary and Fossil Clubs I had the privilege of watching the event along with several other members and Representative Irving Stolberg (present Speaker of the House), himself a mineral collector and without whose help the bill would not have passed. The Connecticut Council worked for four years polling clubs, show visitors, teachers and college instructors before deciding upon the garnet as the favorite choice. The group name was used as it is well-known and we felt that a species name would cause too much confusion. There is an old saying "Keep it simple .....". The major factors in the selection of garnet were its excellent crystal form and its abundance in Connecticut, typified by the Roxbury Almandine.

Because of the vast array of garnet species, varietal names and gem names, it was decided to keep this short article to the six major species, although one (uvarovite) has not been reported from Connecticut. Substitutions occur between many of the principal species listed and the formulas given are for the end members. A complete gradation from one garnet to another can and does occur. In no other group of minerals is this phenomenon, known as solid solution, better illustrated than in the garnets.

The six major species are:

ALMANDINE -  $\text{Fe}_3^{+2}\text{Al}_2(\text{SiO}_4)_3$  - The Iron Garnet

Dark brownish red to purplish red in color. Typically found in metamorphic siliceous rocks such as mica schist and gneiss, also in and around border zones of granitic pegmatites and in amphibolites. Those crystals associated with pegmatites can sometimes be quite large. (My largest one is not from Connecticut, but from the Ruggles Mine in Grafton, New Hampshire. It is 7 cm. No, it's not in a micro box.) Roxbury is well known for its abundance of material in excellent dodecahedral crystals. It is reported from many pegmatite contacts especially Upper Merryall and East Glastonbury, and also from Redding Glen.

ANDRADITE -  $\text{Ca}_3\text{Fe}_2^{+3}(\text{SiO}_4)_3$  - Calcium-Iron Garnet

The color can be green, brown or yellowish to black. It is found in contact metamorphic limestones, alkaline igneous rocks, chlorite schists, skarns and serpentine rocks. Inclusions of fibrous actinolite can often be seen under magnification forming horsetails. It usually occurs in fine sharp crystals.

Edward S. Dana (1877) reported on garnets from the diabase near New Haven which he identified as andradite. He referred to those from Mill Rock as the variety topazolite, and those from East Rock as melanite, a black variety. The described specimens are in the collection at the Klein Geology Laboratory of Yale University.

GROSSULAR -  $\text{Ca}_3\text{Al}_2(\text{SiO}_4)_3$  - The Calcium Garnet

The color ranges from colorless to white, green, yellow, orange and pink. Found in contact metamorphic limestones, skarns, carbonate-rich schists and serpentines. Crystals showing distinct granular texture and transparent crystals showing a swirled effect under magnification are characteristic. A well known Connecticut occurrence is in West Redding where good micro material has been obtained. Other reported localities include Cobalt, Strickland, Haddam, and Carr Brook on the north edge of Collins Hill.

PYROPE -  $\text{Mg}_3\text{Al}_2(\text{SiO}_4)_3$  - Magnesium Garnet

Dark blood red to purplish red in color. Found in highly metamorphosed schists and gneisses, and in serpentines, kimberlite and peridotites. The crystals are rare, but this is the garnet most often found in jewelry. It has been reported from Thompson.

SPESSARTINE -  $\text{Mn}_3\text{Al}_2(\text{SiO}_4)_3$  - Manganese Garnet

The color shades from a yellow-orange to a red-orange to pink. Found in manganese-rich metamorphic rocks and in rhyolites and quartzite. Excellent crystals are found in Connecticut in the granitic pegmatites usually with striations, or as etched and irregular masses with striations forming diamond-like patterns having angles corresponding to the dodecahedral faces. Reported from most all of the well-known Connecticut pegmatites. I have micro crystals from Strickland; Rt. 9, (Haddam); and Gillette.

UVAROVITE -  $\text{Ca}_3\text{Cr}_2(\text{SiO}_4)_3$  - Calcium-Chromium Garnet

Always green in color, it can vary from emerald to dark green. This garnet always occurs close to chromite deposits, in serpentines, metamorphosed limestones and skarns. It is usually found only in micro xls and fine specimens are very rare. it has not been reported from Connecticut.

Physical properties of these species are all basically the same and can be looked up in any text. A member of the group can be found in most all the major types of rock and also in placer deposits. Well-formed garnet crystals are common because the mineral has an extremely strong crystallizing power and is able to develop its characteristic crystal shape under many adverse conditions. Crystals are commonly found as rhombic dodecahedrons and trapezohedrons and sometimes hexoctahedrons. They are also found in many complex modified forms. They can range in size from micro to 60 cm. One could spend a lifetime just collecting this group as a specialty!

The research for this report has been quite an eye opener. Obviously there is much work to be done in the State of Connecticut concerning the garnet group. I plan to follow up this article with more research, so if you have any identified or need-to-be identified micro garnets from Connecticut would you please send a list to me with localities to be included in a master list.

Jim is currently President of the New Haven Mineral Club, and was its Bulletin Editor for a number of years. His work as a Recreation Supervisor qualifies him well as Advisor to the Hamden Junior Mineral Club. He has published a 42-page illustrated paperback entitled "Guide to Eastern Rocks & Minerals".

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## DIVERSITY IN MICROMOUNTING METHODS AND MATERIALS

John C. Ebner, Jr.

As part of my mineral hobby I have made a collection of more than 800 micromounts representing nearly 600 old-time and contemporary collectors. Three portable display cases contain one from each collector, and they are exhibited under the title "Micro-Mounts Past and Present". To anyone examining the display it becomes evident that, tiny as most micromounts are, the methods and materials used in mounting them are limitless.

Depending on size, the specimen may be glued directly onto the container, a black paper insert, balsa or styrofoam platform, or a pedestal. Considering color, size, style, and composition, there are over 100 different types of containers. Although black and clear plastic boxes predominate, green, white, and blue have been used. Of course there are combinations of clear lid and colored bottom (usually black) and vice versa, some boxes being hinged and some with friction-fit covers.

Some mounters aren't satisfied with the regular production boxes. They take clear ones and paint them black inside. Others in order to create a base for labelling will paint all or part of the top of the box white in order to label in black ink, or black on which to write in white. Many times a black paper lining is used inside the box. This creates a less reflective black surface to which most glues will adhere more readily than to the box, and with less chance of the specimen popping off after drying. It also allows both specimen and insert to be removed as a unit for photographing or examining from any angle without disturbing the mounting.

There are several types of paper boxes in use, from the original 1 1/16" x 13/16" x 5/8" fashioned by George G. Rakestraw (hand folded and glued together) to the commercial specimen/jewelry boxes.

Boxes need not be plastic or paper. There are wooden ones made by cutting a cube of wood and drilling a large hole in it to house the specimen. A big drawback to this method is the lack of a lid to keep out dust and foreign objects.

Plastic bottle caps have also been used as containers for micro specimens, but here again you have the open container with its unprotected specimen. The one mount of this type in the display was justifiable, however. During the Depression the mounter found the cost of buying regular micromount boxes prohibitive, yet he could obtain these bottle caps for next to nothing.

There is even one German box with an aluminum base and an aluminum-framed glass top. Probably the cost differential in this box over current plastic ones is greater than that between the plastic and the bottle caps.

Plastic vials, capsules, and tubes as well as glass bottles have also been used. In this type of container the specimen is usually glued to the top or recessed in the container itself, however when glass is used, the specimen is generally attached to a pin or toothpick the other end of which is inserted into a cork, which in turn is used as the stopper for the bottle.

One unusual glass container is a tiny beaker used with a cork stopper on which man-made aluminum-tungsten crystals are mounted which are used for determining the resolution of a scanning electron microscope - a most appropriate choice of container for a laboratory professional.

The old-time glass mounts, attractive as some may be, had their limitations and drawbacks. A ring, generally of brass or lead, but in later years sometimes of hard rubber, was attached to the center of the glass slide with sealing wax or asphaltum. After mounting the specimen in the ring or cell, a cover glass was affixed to the top with the same adhesive. To make the cell more attractive, rings were painted around it in varying colors to complement the specimen. Next decorative paper was applied to the unused portion of the slide. Each process and layer of paint had to dry before successive applications, which resulted in a very time-consuming task. In addition, even though some cells were 1/2 inch high, most were only 1/4 inch or less, thereby severely restricting the size of the specimen being mounted. Pierce cells (brass cells with removable brass lids) used in the late 1800's removed much of the painstaking cell buildup and painting, but did little to increase the size specimen which could be mounted.

The desire to mount larger specimens promoted the use of the paper and plastic boxes used today. Larger specimens can be attached directly to the bottom of the box or to a slab of balsa, foam, or other material cut to fit inside the box. One mounter cuts squares of sheet aluminum with a narrow tab protruding from the rear, which is bent up to a desired height, then forward to support the specimen. The label is cut to the same size as the aluminum square and glued directly onto it. Thus the specimen is suspended directly over its own label.

To mount a tiny specimen, the use of a pedestal became necessary. Here, especially, is where "anything goes". Just about any material or object may (and has been) used to raise the specimen up from the bottom of the box enough for easy viewing. In the "Micro-Mounts, Past and Present" display the following have been noted as pedestals: corks, balsa wood, match sticks, tooth picks, bristles (plastic and sable), glass or plastic rods, pins (both straight and map), rivets, wire, styrofoam, cactus thorns, bamboo slivers, and porcupine quills. Some drill a hole in the bottom of the box through which the pedestal is inserted and adjusted for height before cutting off flush with the bottom of the box.

Multiple specimens in the same container may be found, some in single section boxes and others in multiple-partitioned ones. Boxes with four to one hundred sections are represented in the display.

Groupings of tiny crystals or grains of sand have been mounted on circles of paper or cardboard perched on a pedestal of some kind. A good source of these paper circles is waste from a hole punch.

A combination of the cell and the currently used plastic box is of value for housing several like crystals when exposure of all faces is desired. The specimens are encapsulated in a clear plastic cell which is then mounted in a micromount box. The lid may be removed and the specimen viewed through the clear capsule or cell. Since they are loose in the cell, the crystals will move around with gentle tapping or tilting of the box, but won't spill out if the box is overturned. The cell method is also used when the specimens contained in it may be adversely affected by the atmosphere. One extremely hygroscopic specimen is mounted in a miniature desiccator.

All this comes down to one thing: no matter what the size, shape, style, composition, etc., of the containers you use, if they adequately protect and display the specimens, they are satisfactory, unless of course they are to be entered into competition governed by restrictions.

The impression I do want to make, is that one should adjust the box size to the specimen, not the specimen to the box. Too many times a superb specimen is lost due to breakage when the mounter tried to split it down to fit a certain box. Also, thought should be given to retaining some matrix or mineral associations with the species of interest for future scientific reference, and this generally can't be done if everything but the crystal being mounted is whittled away to fit.

Remember, any mineral which needs magnification to be appreciated is a micromineral, and a micromineral which has been mounted, no matter what the size, is a micromount.

John became interested in minerals about 18 years ago, and in micros about twelve years later, when he began assembling the display described here. He also enjoys mineral photography, and collects such things as mining and mineral-related books and postcards, and postal history such as letters, envelopes, and postmarks.

# MINERALS OF CONNECTICUT: A CHECK LIST

This list of Connecticut mineral species has been compiled by Charles and Marcelle Weber, long-time residents and collectors in that state and is based on appended references plus their personal collection and correspondence. It has been reviewed by Dr. Carl A. Francis, Curator of the Harvard University Mineralogical Museum, who would welcome any information on possible additional species.

Acanthite	Biotite	Cumingtonite	Gahnite
Acmite	Birnessite	Cuprite	Galena
Actinolite	Bismite	Cuprosklodow- skite	Gedrite
Aeschnynite	Bismuth		Gibbsite
Albite	Bismuthinite		Glauberite
Allanite	Bismutite	Danalite	Goethite
Alleghanyite	Bityite	*Danburite	Gold
Allophane	Bornite	Datolite	Gonnardite
Almandine	Brazilianite	Dewindtite	Goslarite
Aluminite	Brewsterite	Diadochite	Graftonite
Alunite	Brochantite	Diaspore	Graphite
Analcime	Brookite	*Dickinsonite	Greenockite
Anatase	Bustamite	Dickite	Grossular
Andalusite	Bytownite	Diopside	Gypsum
Andesine		Dioptase	
Andradite	Calcite	Dolomite	Halloysite
Anglesite	Carbonate-fluor- apatite	Dravite	Halotrichite
Anhydrite	Cassiterite	Dumortierite	Harmotome
Ankerite	Cerite		Hastingsite
Annabergite	Cerussite	Elbaite	Hedenbergite
Anorthite	Chabazite	Enstatite	Hematite
Anthophyllite	Chalcantite	*Eosphorite	Hemimorphite
Antigorite	Chalcocite	Epidote	Heteromorphite
Apophyllite	Chalcocopyrite	Epistilbite	Heterosite
Aragonite	Chamosite	Epsomite	Heulandite
Arrojadite	Childrenite	Erythrite	Hexahydrite
Arsenopyrite	Chondrodite	*Eucryptite	Hureaulite
Atacamite	Chromite	Euxenite	Hyalophane
Augelite	Chrysoberyl		Hydromagnesite
Augite	Chrysocolla	*Fairfieldite	Hydroxyl-her- derite
Aurichalcite	Chrysolite	Fassaite	Hydroxylapatite
Autunite	Clarkeite	Fayalite	Hydrozincite
Azurite	Clinochlore	Ferberite	Hypersthene
	Clinozoisite	Fergusonite	
Babingtonite	Cobaltite	Ferrimolybdite	
Barboselite	Coffinite	Ferrisicklerite	Illite
Barite	*Columbite	Ferritungstite	Ilmenite
Bassanite	Cookeite	Ferroaxinite	Ilsemanite
Bastnaesite	Copiapite	*Fillowite	Ilvaite
Bavenite	Copper	Fluocerite	
Becquerelite	Cordierite	Fluorapatite	Jarosite
Beraunite	Corundum	Fluorapophyllite	Johannite
Bermanite	Covellite	Fluorite	
Bertrandite	Crandallite	Forsterite	Kaolinite
Beryl	Cryptomelane	Fourmarierite	Kutnohorite
Bindheimite			Kyanite

Lacroixite	Oligoclase	Safflorite	Vandendries-
Lanthanite	Opal	Samarskite	scheite
Laueite	Orthoclase	Saponite	Vesuvianite
Laumontite		Sarcolite	Vivianite
Lazulite	Palygorskite	Scheelite	
Lepidolite	Paragonite	Schorl	Whitmoreite
Lipscombite	Pargasite	Scolecite	Wodginite
Litharge	Parsonsite	Scorodite	Wolframite
*Lithiophyllite	Pectolite	Scorzalite	Wollastonite
Loellingite	Pennantite	Sepiolite	Wulfenite
Ludlamite	Pentlandite	Sicklerite	Wurtzite
	Petalite	Siderite	
Maghemite	Pharmacolite	*Sillimanite	Xanthoxenite
Magnesio-horn-	Pharmacosiderite	Silver	Xenotime
blende	Phenakite	Smithsonite	Xonotlite
Magnetite	Phillipsite	Sodalite	
Malachite	Phlogopite	Soddyite	Yttrotantalite
Manganite	Phosphoferrite	Spessartine	
Manganocolumbite	Phosphophyllite	Sphalerite	Zinnwaldite
Manganotantalite	Phosphuranylite	Spinel	Zircon
Margarite	Pickeringite	Spodumene	Zoisite
Marcasite	Piemontite	Staurolite	
Marialite	Pigeonite	Stewartite	
Massicot	Pitticite	Stibnite	
Meionite	Plattnerite	Stilbite	
Melanterite	Plumbojarosite	Stilpnomelane	
Messelite	Pollucite	Strengite	
Meta-autunite	Powellite	Strueverite	
Metatorbernite	Prehnite	Strunzite	
Microcline	Pucherite	Sulfur	
Microlite	Pumpellyite	Synchysite	
Mimetite	Purpurite		*Connecticut is
Minium	Pyrite	Talc	the type locality
Mitridatite	Pyrochlore	Tapiolite	for this mineral
Molybdenite	Pyrolusite	Tenorite	
Monazite	Pyromorphite	Tephroite	
Montebrasite	Pyrope	Tetrahedrite	
Monticellite	Pyrophanite	Thorite	
Montmorillonite	Pyrophyllite	Thorogummite	
Moraesite	Pyrrhotite	Titanite	
Morenosite		Todorokite	
Morinite	Quartz	Topaz	
Muscovite		Torbernite	
	Rammelsbergite	Tremolite	
Nacrite	*Reddingite	Triphylite	
Nantokite	Renardite	Triplite	
Natrojarosite	Retgersite	*Tripliodite	
Natrolite	Rhabdophane	Tungstenite	
*Natrophilite	Rhodochrosite	Tungstite	
Nepheline	Rhombochase		
Nickel-skutter-	Rhodonite	Uraninite	
udite	Rozenite	Uranmicrolite	
Nickeline	Rutile	Uranophane	
Nontronite		Uranophane-beta	



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- J. F. Schairer, Bulletin #51, State Geological & Natural History Survey, "The Minerals of Connecticut" (1931).
- J. A. Sohn, Bulletin #77, State Geological & Natural History Survey, "Connecticut Minerals, Their Properties and Occurrence" (1951).
- R. E. Januzzi, "The Minerals of Western Connecticut and SE New York State" (1959) "The Mineralogy of Connecticut and Southeastern New York State" (1961) (includes Middletown area by Schooner)
- R. Schooner, "Some of the Newer Connecticut Minerals" Dec. 14, 1965  
List of minerals of the Middletown District, Aug. 1983 (Personal Communication)
- G. J. Brush and E. S. Dana, "The Branchville Papers", Contributions to Mineralogy and Petrography" (1901)

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SELECTED PUBLICATIONS ON THE MINERALS OF MONT ST-HILAIRE

This list is confined to articles or publications which contain information of general interest to collectors, and which are fairly accessible to them. Space does not permit inclusion of the many papers which describe individual minerals.

- Anderson, V. (1979) "Microminerals", Mineralogical Record 10:103
- Chao, G.Y., D.C. Harris, A.W. Hounslow, J.A. Mandarino, and G. Perrault (1967) "Minerals from the Nepheline Syenite, Mont St. Hilaire, Quebec", Canadian Mineralogist 9:109-123.
- Chao, G.Y. and J. Baker (1979) "What's New from Mont St-Hilaire, Quebec", Mineralogical Record 10:99-100.
- Gregory, G. (1967) "The Desourdy Quarries, St. Hilaire, Canada", Gems & Minerals #355 (April): 26-27, 56-57.
- Henderson, W.A., Jr. (1982) "Microminerals", Mineralogical Record 13:241-247.
- Jones, R. (1981) "Mount St. Hilaire...", Rock and Gem 11 (October): 52-55, 76.
- Mandarino, J.A., G.Y. Chao, R.A. Gault, and R.K. Herd (1986) "Mineralogy and Petrology of Mont St-Hilaire, Quebec", Geological Association of Canada, Mineralogical Association of Canada, Canadian Geophysical Union; Joint Annual Meeting, Ottawa '86 Field Trip 9A: Guidebook. 22 pages. Order from Geological Association of Canada, c/o Department of Geology, Carleton University, Ottawa, Ontario, Canada K1S 5B6. \$7.00 including postage and handling.
- Mandarino, J.A. and V. Anderson (to be published) "Mineralogy of Mont St-Hilaire", Cambridge University Press, New York.
- Marble, L. and A. Regis (1979) "The Minerals of Mont St. Hilaire" Rocks & Minerals 54:4-25.
- Weber, M. (1985) "What's New from Mont St-Hilaire", Micromounters of New England Northeast Meeting Program Book, 1984:14-17.
- Wight, Q. and G.Y. Chao (1986) "Mont Saint-Hilaire Revisited" Rocks & Minerals 61:182-197.
- Worcester Mineral Club (1973) "Geology and Mineralogy of Mount St. Hilaire, Quebec", Worcester, Massachusetts. 46 pages.

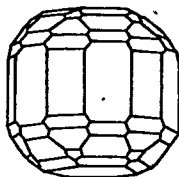
NUMBERED UNKNOWNNS FROM MONT ST-HILAIRE

UK numbers are assigned by Professor George Y. Chao of Carleton University in Ottawa to specimens when data from tests made on them do not match those of any previously described species. Further study may reveal them to be new minerals, as in those marked by an asterisk (\*), but often they turn out to be mixtures or varieties of known species. Some numbers have been omitted due to the fact that they were soon identified as known species and their description was never published; therefore their identity would be meaningless. We would like to thank Dr. Chao for updating the list and granting permission to publish it.

<u>UK</u>	<u>Species, References</u>	<u>UK</u>	<u>Species, References</u>
4	*Steacyite (1)	36	Miserite (2)
5	Labuntsovite (1)	37	Ewaldite
6	*Monteregianite (1)	37a	(2,3,4)
12	Cordylite (1)	38	(2,3,4)
13	*Lemoynite (1)	39	Tadzhikite (2,3,4)
15	*Carletonite (1)	40	Carbocernaite (2,3,4)
17	*Perraultite (1,2,4)	41	(2,3,4)
18	Tundrite (1)	42	*Petarasite (2)
19	Nenadkevichite (1)	43	Franconite (2)
20	*Hilairite (1)	44	(2,3,4)
22	Britholite (2)	45	*Doyleite (2)
23	*Gaidonnayite	46	Epistolite (2)
24	(2,3,4)	47	(2,3,4)
25	*Yofortierite	48	(3,4)
26	Albite-Parisite mix (2,3,4)	49	Terskite (3,4)
27	*Thornasite (2,3,4)	50	Hochelagaite (4)
28	Vinogradovite	51	(3,4)
29	(2,3,4)	52	(3,4)
30	Mckelveyite	53	(3,4)
31	(2,3,4)	54	*Griceite (3,4)
32	(2,3,4)	55	(3,4)
33	*Donnayite	56	(3,4)
34	Rhabdophane (2)	57	(3,4)
35	(2,3,4)	58	

References contain abstracts of information available at the time of publication. Full citations will be found under "Selected Publications on the Minerals of Mont St-Hilaire".

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|--------------------------|---------------------------|
| 1. Chao et al (1967)     | 3. Mandarino et al (1986) |
| 2. Chao and Baker (1979) | 4. Wight and Chao (1986)  |



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