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. 237 April 2002

Next Meeting

Saturday, April 20
Westford, MA
Public Library
Doors open at 10AM

Map and directions are on the back page

Dues are $10/person or $15/family for the calendar year, payable by Dec. 31 for the new year.
Mail payment to the Membership Chairperson Brian Porter 355 Walsh Ave., Newington, CT 06111

American Federation of Mineral Society Code of Ethics

I will respect both private and public property and will do no collecting on privately owned land without the owner's permission.

I will keep informed on all laws, regulations of rules governing collecting on public lands and will observe them.

I will to the best of my ability , ascertain the boundary lines of property on which I plan to collect .

I will use no firearms or blasting material in collecting areas.

I will cause no willful damage to property of any kind - fences, signs, buildings.

I will leave all gates as found.

I will build fires in designated or safe places only and will be certain they are completely extinguished before leaving the area.

I will discard no burning material - matches, cigarettes, etc.

I will fill all excavation holes which may be dangerous to livestock.

I will not contaminate wells, creeks or other water supply.

I will cause no willful damage to collecting material and will take home only what I can reasonably use.

I will practice conservation end undertake to utilize fully and well the materials I have collected and will recycle my surplus for the pleasure and benefit of others.

I will support the rockhound project H.E. L.P. (Help Eliminate Litter Please) and will leave all collecting areas devoid of litter, regardless of how found.

I will cooperate with field trip leaders and those in designated authority in all collecting areas.

I will report to my club or Federation officers, Bureau of Land management or other authorities, any deposit of petrified wood or other materials on public lands which should be protected for the enjoyment of future generations for public educational and scientific purposes.

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I will appreciate and protect our heritage of natural resources.

I will observe the "Golden Rule", will use "Good Outdoor Manners" and will at all times conduct myself in a manner which will add to the stature and Public "image" of rockhounds everywhere.

The MMNE is a member of the EFMLS and thus the AFMS, and therefore needs to adhere to these rules of conduct. They need to be incorporated, either directly or indirectly, into the MMNE by-laws as they are revised over the next year. Ed.

MMNE NEWS AND BUSINESS

The annual business meeting is in April. Elections and other business are conducted at that time so that there will not be any need for MMNE business activities at the May meeting. At the April meeting the following slate of officers, subject to any nominations from the floor, will be presented for a vote:

President: Jim Cahoon
Vice-President: Bob Janules
Corresponding Secretary: Chris Hubley
Recording Secretary: Pat Barker
Treasurer: Anita Hubley
Membership Chairperson: Brian Porter
Editor: Mike Swanson

There are two proposed by-laws changes for consideration as well. The first is to delete the two directors from the executive committee. The second is to make the Membership Chairperson and Editor of the *Newsletter* executive committee officers rather than appointed positions. The details are listed on the absentee ballot mailed in the March issue of the *Newsletter*.

MICROMOUNTING TIPS AND TECHNIQUES

BEAM IN AND GET IN THE ZONE

William A. Henderson, Jr.

Perhaps the most important aid to identifying micro minerals is studying their crystallography. All advanced collectors do so, and beginning and intermediate collectors should do so. Obviously, the shape of crystal faces is very important. Does a face have three, four, five or six sides? Or more? Are the sides the "same" or different? Is a five sided face a pyritohedral face or a cube face with one corner modified by the octahedron? Are several faces on the crystal those of a single form, for example a hexagonal prism? Do some faces which appear to be at right angles to each other have a luster or growth markings different from the others? If so, probably the crystal is not isometric but rather tetragonal or orthorhombic.

Recognizing a the zones of a crystal, their properties, and the relationships of one zone to another, are a critical part of crystallographic study. Dana's textbook states that a zone includes a series of faces on a crystal whose intersection lines are mutually parallel to each other. They are also parallel to an imaginary line or axis, known as the zone axis, which is envisioned as running parallel to these intersection lines and through the middle of the crystal. The six sides of a lead pencil, for example, define a zone for which the "lead " is the zone axis. As another example, each face of the cube shown below falls in two different crystal zones, the zone axes of which are identical to two of the crystallographic axes. The eight faces of the octahedron fall into two zones, but the zone axes are not crystallographic axes. Each of the 12 faces of a dodecahedron is part of three different zones. The first and most obvious zones are the ones parallel to a crystallographic axis, and they are composed of four faces. The second and third are less obvious zones which have six faces, and are parallel to threefold or {111} axes. It is for this reason that a dodecahedral garnet, for instance, if viewed down a threefold axis, can be mistaken for a hexagonal or rhombohedral crystal. Of course, faces of more than one type can lie in a zone, as witness the faces m, s and b of the last crystal shown.

Well, who cares? We all should. It is through the identification of crystal faces and zones that one assigns crystals to one of the six crystal classes - isometric, tetragonal, orthorhombic, hexagonal, monoclinic, and triclinic, and thus, one drastically limits the number of possible identities for an unknown. Determining crystal form and color are the first two critical steps in working with micro mineral unknowns.

The above is not meant to be a short course in crystallography. Rather, it is an introduction to the fact that the sole factor which allows us to study crystal forms and color is the reflection of light off the faces of a crystal. Critical to understanding these reflections (and, thus, the crystal's forms) is to have the spatial arrangement of one's microscope, light and specimen arranged in a fixed and simple geometry such that one can envision what one is seeing, and manipulate the specimen easily to do so; i.e., to control and understand those reflections.

Far too many micromounters today use fiber optic light sources with one or two lights hitting the specimen under the microscope at some random angle from the side, as in Figure A below. They raise and lower the specimen and repoint their light sources without any idea of the geometry they are producing. They have little idea of where a reflection is coming from and no idea at all how to twist and turn the specimen to illuminate one or, even more difficult, a series of crystal faces in a zone in succession. To rotate a crystal about a zone axis is nearly impossible since the orientation of the axis relative to the light source and microscope is essentially unknown and variable. Furthermore, a very high degree of manual dexterity is required to rotate a specimen about an axis at a random angle to the side. The geometry in Figure A ensures that one's thumbs are forever shadowing the specimen from the light source. Far better is the geometry in Figure B where there is a known relationship between light source, specimen and the eye. A particular zone and zone axis are easily studied by simply moving the specimen so that the zone axis is perpendicular to the light-microscope-eye plane. One is not fumbling about in three dimensional space, but needs only to think in two dimensions. It is easy to study angular relationships between faces, and to bring a series of faces into reflecting position. And last but not least, one can move and rotate the specimen using one or both hands without sticking one's thumbs, finger tips or knuckles into the light beam.

Achieving the geometry in Figure B is easy enough with most modern microscopes. Those used to having the microscope's stand beyond them from the scope's optics and the light source to the side can usually rotate the scope's head 180° so that the optics are between the post and the light source. Those with single or double beam fiber optic light sources can use a single light source as in Figure B, or bring their two light sources close together and parallel.

Studying crystallography is not easy, but following the above steps will make it much easier. Using the geometry in Figure B will get you on the beam and in the zone!

(Diagrams are on page 4)

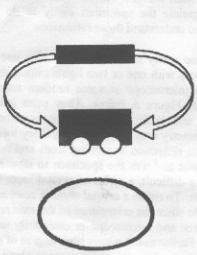


Figure A

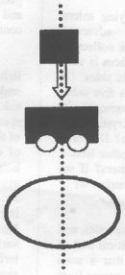
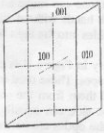
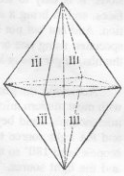


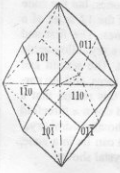
Figure B



Cube

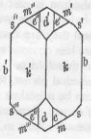


Octahedron



Dodecahedron

First Order Prism



Good weather is coming and with it the risks of skin cancer. The following tips might make your collecting trips safer both today and for many years into the future.

Safety—Sun Exposure
Chuck McKie. CFMS Safety Chair 2001
Excerpted from Microbits, June 2001

Q - Under what types of weather conditions do people need to worry about sun exposure?
A - Any time the sun's ultraviolet (UV) rays are able to reach the earth there exists a risk for excessive sun exposure. UV rays are present on bright and sunny days, but UV rays also can penetrate through cloud and haze cover making cloudy and overcast days dangerous as well. Moreover, UV rays reflect off water, cement, sand and snow. As a result, UV rays can even cause damage in the winter when there is snow on the ground. Relatively speaking, the hours between 10AM and 4PM DST are the most hazardous for UV exposure in the continental United States. UV radiation is also the greatest during the late spring and early summer in North America.

Q - How can people protect themselves from the sun's UV rays?
A - There are a number of ways you can protect yourself. When possible, avoid outdoor activities during the hours between 10AM and 4PM when the sun's rays are the strongest. Wear protective clothing such as a broad-brimmed hat, long-sleeved shirt, and long pants. Wear sunglasses that provide 100% UV protection. Always wear a broad-spectrum (protection against both UVA and UVB) sun screen with a Sun Protection Factor (SPF) of at least 15. Remember to reapply as indicated by the manufacturer's directions. (The SPF of 15 means that it takes 15 times as long to get the same sun exposure as with no sun screen. Ed)

Q - What does excessive exposure to these UV rays do to one's skin?
A - While some people believe otherwise, a suntan by itself is not an indicator of good health., and in fact, the sun exposure one gets while tanning actually can cause damage to the skin. The sun's UV rays will kill some cells and damage others. It is the penetration of those UV rays to the skin's inner layer which results in the production of more melanin. The melanin eventually moves towards the outer layer of the skin and becomes visible as a tan.

Q - Not everyone burns or tans in the same manner. Are there ways of classifying different skin types?
A - Whether individuals burn or tan depends on a number of factors, including their skin type, the time of the year, and the amount of sun exposure they have received recently. The skin's susceptibility to burning can be classified on a five-point scale as outlined in the following table:

Skin type sunburn and tanning history
I - Always burns, never tans, sensitive to exposure
II - Burns easily, tans minimally
III - Burns moderately, tans gradually to light brown
IV - Burns minimally, always tans well to moderately brown
V - Rarely burns, tans profusely to dark brown
VI - Never burns, deeply pigmented, least sensitive

Though everyone is at risk for damage as a result of excessive sun exposure, people with skin types I and II are at the highest risk (for both burning and skin cancer.)

Some other comments (Ed.):

- Even if you have a low risk for burning, you still are at risk for the development of skin cancer.
- Skin cancer comes in at least two forms. Basal cell cancers are usually nuisances if discovered and treated early. They do not cause distant spread (metastases) in the body. Melanomas, however, can spread early and have a significant mortality rate associated with their occurrence.
- Cloudy days do not protect you. The UV rays penetrate through cloud cover.
- A suntan does not protect you from the risk of skin cancer.
- As mineral collectors, we are not going to stay out of the midday sun, so use your protection. Safe exposure time in the summer without protection is typically 8 minutes for fair skinned people, 14 for medium skinned people, and 22 minutes for dark skinned people. Reapply sunscreen at least every two hours regardless of its strength. Sweating causes it to disappear.
- Thin clothing such as cotton t-shirts provide very little protection as the UV rays will go right though the cloth.
- Some medications including antibiotics and birth control pills, as well as some cosmetics increase sun sensitivity.
- While collecting, our high risk areas for exposure are the face, back of the neck, top of the ears, and back of the hands.
- ***One serious episode*** of sunburn as a child may put the person at high risk for developing skin cancer.
- There is some recent medical evidence that the use of sunscreen does not protect against the development of melanoma, the deadliest of the skin cancers.
- No matter how safe you feel that you have been regarding sun exposure, you are at some risk. Make sure that your doctor checks you for skin cancer at least once a year. Report any change in moles or dark spots on your skin. Increasing size, elevation of the spot, irregular borders and bleeding are all warning signs of possible skin cancer.