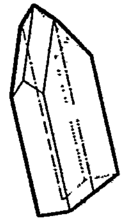
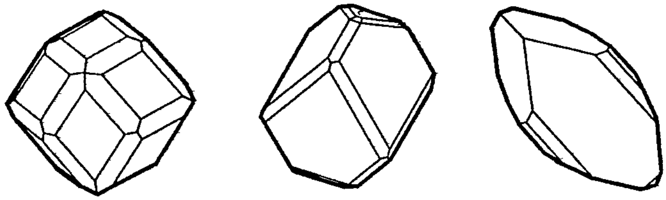
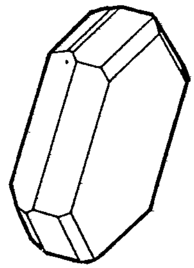
$1.50

MICROMOUNTERS
OF NEW ENGLAND







NORTHEAST MEETING

May 11, 1985

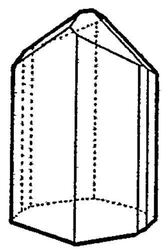
•

4-H Conference Center
Ashland, MA

PROGRAM

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

THE MICROMINERALS OF FRANKLIN AND STERLING HILL, NJ
by
John L. Baum



2:00 Door Prize Drawings
4:00 Departure

Additional Information ———

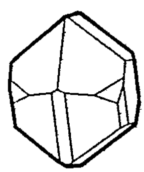
Mrs. Janet Cares, 18 Singletary Lane, Sudbury, MA 01776 • (617) 443-9180

GUEST SPEAKER: John Leach Baum
Box 247, Route 23N
Hamburg, NJ 07419

Though Jack Baum's profession and Harvard degree were in geology, has has made a lifetime hobby of mineral collecting. Until retirement he was exploration geologist for the New Jersey Zinc Co., operators of the Franklin and Sterling Hill mines.

He is an active member of the Franklin-Ogdensburg Mineralogical Society and has been curator of the Franklin Mineral Museum since its opening in 1965. Since many of the more than 300 species from these mines occur only in minute crystals, it was inevitible that he should become interested in micromounting.

He has a number of publications to his credit, most of which pertain to the Franklin-Sterling Hill area. Baumite and johnbaumite, both Franklin minerals, are named in his honor. John and his wife Augusta have two sons and one grandson, also named after him.



THE PAIN, THE PAIN ....Forrest F. Fogg

"What you don't know won't hurt you" is an old wives tale when it comes to mineral collecting and should be changed to - "Fools rush in where angels fear to tread".

Being a retired mine owner and avid mineral collector for over twenty years, I have picked up some excellent pointers on how NOT to collect. Mineral collecting can be a safe, healthy outdoor hobby until it becomes an obsession. This is when greed, avarice and poor judgement rear their ugly heads.

It appears that the more difficult the collecting, the greater the risk of personal injury. To start the rocks falling, let's begin with hard rock collecting. This can be at an old mine, a quarry or out in the woods in some remote location.

Old mica mines in pegmatite formations that have the dumps covered over by forest litter do not present a problem. Old mica mines that have been recently or are now being worked can be quite hazardous. New blasting can expose exciting fresh material, but it also presents new problems that the experienced collector takes precautions against. Most pegmatite mines in New England have an abundance of quartz which, when freshly blasted, can contain edges as sharp as a razor. Just picking up a piece of quartz and tossing it aside can produce a small cut. The wise collector will wear gloves as it saves many small but painful lacerations and needlelike quartz injections.

Bringing youngsters to a mine can age a mine owner ten years in one afternoon. Little tots will run, fall and get cut on sharp edges of quartz. They twist their ankles and hit their heads on rocks and get concussions. They do all this in between the times that they are climbing the quarry walls or throwing rocks into a 100 foot deep water-filled shaft.

Areas such as road cuts, as well as mines and quarries, could turn up an unexploded stick of dynamite or an unexploded primer. A primer is a metallic tube about 1-1/2 inches long and as big around as a slender pencil, containing an explosive charge. The primer is pushed into a stick of dynamite and then attached to a detonator by means of two fine wires which carry electrical charge to the primer. Children pounding on a primer with a rock have been known to blow off a finger and other children watching hit by the shrapnel-like fragments.

The chance of finding an unexploded stick of dynamite is probably remote, but it is a possibility and should be handled with extreme caution. The older the stick of dynamite, the more unstable and dangerous it becomes. Any finding of dynamite should be reported to the mine owner or to the State Police. The State Police issue licenses for use of explosives and have permanent personnel to govern the use and transportation of explosives.

A collector that this article will probably never reach is the beginner who sallies forth with a carpenter's hammer, complete with home-made wooden handle, made by somebody's grandfather, and an old cold chisel or screwdriver. The danger comes when the collector struggles to hit the chisel with the carpenter's hammer. The hammer head is small and tends to strike the chisel off-center and deflects onto the collector's hand. It feels so good when one stops!

A three or four pound sledge-hammer has a larger head and is much safer to use...and much more effective. This hammer is heavier and, if you are a "weekend warrior", you will become fatigued much sooner and subject to hitting your hand and not the chisel, unless you rest occasionally.

If you do not pay attention to what you're doing, consider what happened to a couple of collectors I observed in Herkimer, New York. The limestone in this region can be extremely hard and collectors tend to lose their concentration in their zeal to open a pocket containing crystals. One collector was holding a chisel in position with his foot while swinging a sledge-hammer. When I saw him the next day, he had his toes bandaged up and the toe of his shoe cut out to accommodate the bandages. In case you have not put two and two together, he missed the chisel and hit his toes with a ten pound sledge-hammer. The other collector absentmindedly put his thumb over the top of the chisel while holding it and then bashed it with a three pound sledge-hammer.

Pounding on rocks and chisels with a sledge-hammer can cause a collector to lose an eye unless he exercises caution. Chisels with burred up tops can send steel fragments flying. Keep burrs and rolled over edges of your chisel off to protect yourself and others around you. A heavy sledge-hammer can send rock fragments flying with explosive force for some distance. Closing your eyes will not protect them against a direct hit, but safety glasses will, so wear them. After all, for micromounters, a stereo microscope does not help a collector judge depth who can only see with one eye.

Climbing ledges can be as frustrating as "climbing the wall", especially if you are trying to back down off a ledge and your feet cannot find those toe holds you so conveniently found on the way up. Even when you can find your way back down, you may be in trouble, if your legs become too fatigued or cramped. A fall in a remote area can mean long hours of delay with broken bones before a rescue team can be organized to reach you. Inclement weather can add to your woes, and possibly, your survival.

One other activity which I find particularly irksome, as well as a breach of good etiquette, is the person who moves into a spot directly under where you are working and starts collecting. The material that is being pulled out and dumped down the ledge is usually barren and not worth getting a rock bounced off one's head. If you are the type who feels you have your rights and can collect anywhere you want, at least wear a hard hat and make sure your insurance is paid up.

Underground collecting is not a common activity in the northeast, but is prevalent in the western states. While the author's collecting in the West has been limited, a few dangers are quite apparent. There are many abandoned open shafts in the western states and exploring them can highly risky. Climbing down old ladders into a vertical shaft 80 to 100 feet deep is fine as long as the wood is not rotten and there are no poisonous gases at the bottom. Some shafts, even trenches, can and do fill up with poisonous gases that are heavier than air and are odorless.

A bat colony is often found in old mine shafts along with an accumulation of guano. A few years ago, two biologists studying bats in a Texas mine came down with rabies. Since neither one of the biologists were bitten or scratched by the bats, it left the question as to how they became infected. One theory is that the virus was present in the humid air and was breathed in. The other theory proposed is that the virus was present in the air or droppings and came in contact with a scratch in the skin of the biologists. Since bats are known to be carriers of rabies, close contact should probably be limited or avoided..

Some of the more common hazards to western collecting areas are the rattlesnakes, cactus, scorpions and getting stranded in the desert without any water. A more subtle hazard to collectors in the West is a fungus disease called "Valley Fever". The spores of this fungus are found in the soils of some localities. When disturbed by digging, the spores can be breathed in and end up in the collector's blood stream. The results can be a crippling of the joints as well as mechanical pneumonia and, in some instances, it has been known to be fatal.

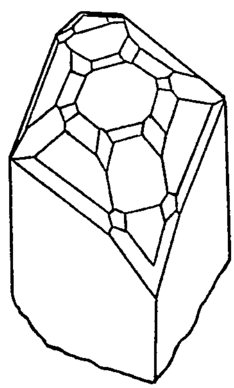
The Mexican or Three Spotted Scorpion is a small scorpion, but a particularly dangerous one. Fortunately, its range north of Mexico is limited to the southern portion of the western states. A sting from this creature can cause a person to lose consciousness, then go into convulsions where the body is periodically pulled into tight knots. A lack of immediate and intensive hospital care will result in death.

If you do not like scorpion or rattler stings and bites, do not turn over rocks or pieces of wood with your hands. Snakes are cold blooded and seek the early morning sun to get warmed up, but when the sun gets too hot, they will seek shade to conserve moisture in their bodies.

Last, but not least, is the collector who makes like a gopher. He will dig down under anything with complete disregard for his personal safety. A cave-in can crush a person's chest or bury him alive.

We should all ask ourselves before committing some risky act, "Is the prize worth the risk?". The answer is usually "No".

At one time Forrest was co-owner of the Palermo mine and is particularly knowledgeable about its minerals. He also likes other New Hampshire minerals and phosphates in general. Before retirement, he was a game biologist for the State of New Hampshire. The mineral foggite was named after him.



FASCINATING "AVENUES" TO EXPLORE IN IDENTIFICATION

Ralph L. Carr, Jr.

Introduction: A fascinating and never-ending pursuit for micromounters is the identification of our unknown micros. Fascinating avenues will be pointed out for one to follow to create his or her own scheme of identification. From these schemes you will eventually identify an unknown micro "off the cuff".

Locale/Rock Formation/Mineralization/Associations/Paragenesis
A most important beginning is a knowledge of the locale and rock-mineral formation at that locale where our micros originated. Some of the possible rock-mineral formations are: Basalt, Granitic Pegmatite, Nepheline-Syenite, etc. Knowing the rock-mineral formation is a clue to the suite of minerals that could be deposited there. For example, Palermo #1 at North Groton, NH is a Granitic Phosphate Pegmatite deposit. Around 100 minerals have been identified from Palermo. They include sulfides, oxides, carbonates, silicates and 64 phosphates. One clue this knowledge gives us is that most of our micros will be phosphates. Also, being a pegmatite or a coarse granite deposit, indicates that larger crystals of quartz, feldspar, beryl or schorl (tourmaline) may be found there also.

In a phosphate pegmatite there may be several seies of iron (Fe), manganese (Mn)phosphates including triphylite - lithiophylite, heterosite-purpurite, childrenite-eosphorite and messelite-fairfieldite. As listed here, iron predominates in the first named member of each series and manganese in the other. At Palermo and other locales where the Fe and phosphates predominate (Big Chief, Tip Top and Bull Moose in South Dakota) you would expect to find childrenite and messelite, for example, while at deposits where the Mn end predominates (Strickland and Branchville CT, the Foote Mine in NC, Newry, Maine and Pala, California, their opposite end members eosphorite and fairfieldite would be expected.

The rock-mineral formations at some well known locales are:
St. Hilaire, Quebec - Igneous Nepheline-Syenite deposit
Francon, Montreal - Igneous Silico-Carbonate sill.
Tri-state area - Lead, Zinc, Iron Sulfide, sedimentary deposit.
Crestmore, Calif, and Franklin, NJ - Metamorphic marble Skarn deposit.
Mapimi, Durango, Mexico - Lead, Copper and Zinc sulfide veins, sedimentary Limestone deposit.

Associations are also valuable clues to suites of minerals that tend to occur together. Galena, e.g., can be associated with silver, sphalerite, pyrite, barite, anglesite and cerussite. The enclosing rock could be quartz, limestone or chert. Along with calcite can occur aragonite, dolomite, pyrite, siderite, quartz and chalcopyrite, etc. Thus, according to the rock-mineral formation and associations, there will occur together associated suites of minerals.

The successive stages of primary crystallization, metasomatic alteration and hydrothermal addition and/or replacement are changes due to varying temperatures, oxidation conditions and the effect of water. This is called paragenesis. A micro which has evolved in the late hydrothermal stage will indicate similar minerals which you can look for on the same matrix or from the same locale. Studying your locale is the first and very important avenue to explore. Now you can make up a table describing the rock-mineral formations and paragenesis of each locale.

After your search of the literature you will have recorded data or info on your favorite locales with their associated minerals. Now list the minerals in tabular form, along with the following headings:

Mineral Paragensis Color Habit Xl System Luster Cleavage Diaphaneity Specific Gravity

...or simplify this table thusly:

Mineral Paragenesis Color Habit Unique Identifying Features

If you need space, then use a code for some of the properties and list the codes at the bottom of the table, thusly:

Color: 1- Red, 2-Pink, 3-Orange, 4- Yellow, 5-Green, 6- Blue, 7-Violet, 8- Colorless, etc.
Habit: 1- Acicular, 2- Fibrous, 3- Prismatic or Columnar, 4- Bladed, 5- Tabular, 6- Micaceous, 7- Radiating Spray, 8- Dendritic, 9- Coating, 10- Plumose, etc.
Crystal system: 1- Cubic, 2- Hexagonal, 3- Tetragonal, 4- Orthorhombic, 5- Monoclinic, 6- Triclinic, 7- Trigonal.
Luster: 1- Vitreous, 2- Resinous, 3- Greasy, 4- Silky, 5- Pearly, 6- Metallic, etc.
Diaphaneity: 1- Transparent, 2- Translucent, 3- Opaque, 4- Subtranslucent, etc.

Color and Habit Form are the most obvious properties you will observe under magnification. Color is more important for identification with the Idiochromatic group of minerals. For this group color is characteristic of the mineral. Blue azurite is one example. The Allochromatic Color groups are minerals that are usually colorless when pure but color presence is caused by impurities or by the atomic structure or structural defects. Your table under the color heading will note the usual color of the mineral at that locale. Also, you will have the habit form of each mineral at a locale noted in your Table.

If you have micros to spare, then a specific gravity determination can be a deciding identifying factor. Janet Cares has discussed this determination in our MMNE Newsletters. The employment of UV light is another important identification method. At each locale, know which minerals will fluoresce a certain color under either the long or shortwave UV. Scheelite will fluoresce bluish white and calcite often red or pink. Aragonite has fluoresced white under UV. Autunite will always fluoresce yellow-green. If discernible under the microscope, striations are another deciding factor in identification, whether vertical or horizontal, etc.

You now could set up a 4 or 5 digit system of Identification. Pick 4 or 5 properties of a group of minerals, from one locale, on which you have adequate information. Similar to the coding system already mentioned, assign numbers or letters to each property which specifically describes that property. For example:

Color: 1- Red, 2- Pink, 3- Orange, 4- Yellow, 5- Bluish-green, 6- Blue, etc.
Habit: 1- Fibrous, 2- Prismatic, 3- Rhombohedral, 4- Radial Fibrous Sprays, etc.
Cleavage: 1- Perfect, 2- Good, 3- Fair, 4- None, 5- On one Face.
Diaphaneity: 1- Transparent, 2- Translucent, 3- Opaque, etc.
Luster: 1- Vitreous, 2- Resinous, 3- Greasy, 4- Vitreous To Dull, 5- Metallic, etc.
Striations: 1- Vertically, 2- Horizontally, 3- On one Face, etc.
Specific Gravity: A- 2.50 to 2.70, B- 2.71 to 3.00, C- 3.01 to 3.40, D- 3.41 to 3.80.

Make up your own code, according to the range of properties for the specific group of minerals you are working with. The above code is one example. Beraunite could be coded thusly, taking the above properties in order: 54224C1.

Code all the minerals from one locale thusly. You then can compare the code of your unknown with this coded group. You will narrow down or completely identify your unknown micro.

We have now taken you through several fascinating "Avenues" of exploration.

When you have completed all the studies and tables, you are well on the way to being an expert mineralogist. Your first step, however, is to write down the definition of each unknown term or property.

GOOD EXPLORING!

Ralph is a charter member of the Micromounters of New England and has served as Secretary since its inception. He is a chemist by profession, though now semi-retired. His particular interests are the minerals of Palermo, St. Hilaire and Strickland.

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Babingtonite - No 42

Autunite & Benitoite - No 46

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Shaft No 10, Quabbin Reservoir, MA - No 54

New York State Collecting Note - No 53

Chemical and Blowpipe Tests for Silicates - No 67

Connecticut Mineral Localities - No 64

Typical Cleavages - No 66

Crystal Group Terms - No 67

Franklin-Sterling Hill: New & Rare Minerals - No 73

Apatite Group - No 75

Aids to Mineral Identification, Solubility - No 76

Zeolites - No 77

Non-Pegmatite Phosphates - Nos 72, 73 & 75

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MINERALS OF RHODE ISLAND: A CHECK LIST

Despite the small size of Rhode Island, it has quite a number of interesting species. The list presented is based primarily on information in "Minerals of Rhode Island" by the late Clarence E. Miller, with maps and photographs by Gilbert George (one of MMNE's founders) and edited by Professor O. Don Hermes. Both Gil, who has collected widely in Rhode Island, and Dr. Carl Francis, Curator of the Harvard Mineralogical Museum, were consulted in compiling the final, conservative list. We hope that collectors who have questions or additional species will consult with the editor with information and/or specimens for examination.

acmite
actinolite
albite
allanite
almandine
amphibole*
anatase
andradite
anglesite
ankerite
anthophyllite
antigorite
apatite*
apophyllite*
aragonite
arsenopyrite
astrophyllite
augite
aurichalcite
autunite
azurite

barite
bastnaesite
bertrandite
beryl
biotite
bornite
braunite
brookite

calcite
cerussite
chabazite
chalcocite
chalcopyrite
chlorite*
chloritoid
chrysocolla
chrysotile
clinochlore
clinozoisite
columbite/tantalite
copper
cordierite
covellite

danalite
diopside
dolomite

epidote
eudialyte

fayalite
ferrimolybdite
ferroaxinite
fluorapatite
fluorite
forsterite

galena
genthelvite
gmelinite
goethite
gold
graphite
greenockite[1]
grossular
gypsum

halite
hematite
hemimorphite
heulandite
hornblende

illite
ilvaite

jamesonite

kaolinite
kyanite

laumontite
loellingite

magnetite
malachite
manganite
marcasite
melanterite
microcline
molybdenite
monazite
montmorillonite
muscovite

natrolite
nontronite

opal
orthoclase

palygorskite
paragonite
pargasite
parisite
phlogopite
piemontite
plagioclase*
powellite
prehnite
pyrite
pyrolusite
pyromorphite
pyroxene*
pyrrhotite

quartz

rhodochrosite
rhodonite
riebeckite
rutile

scapolite*
scheelite
schorl
scolecite
serpentine*
siderite
sillimanite
silver
smithsonite
spessartine
sphalerite
staurolite
stibnite
stilbite
sulfur

talc
titanite
tourmaline*
tremolite

vermiculite
vesuvianite

wavellite
wulfenite

xenotime

zinnwaldite
zircon
zoisite

* Groups in which exact species may not have been identified.
1 May be hawleyite.

INTRODUCTION TO COMPUTERIZED SYSTEMS FOR THE MICROMOUNTER

Robert Monaghan

It would be presumptive of me to assume that micromounters have a more difficult time with their interests than collectors who are interested in other size specimens, but I have been able to isolate three areas which present sizable problems principally concerned with the area of micromounting. The first of these difficulties is that the identification of a micro-sized mineral is often more difficult than that of its larger cousins. The second (perhaps more of an asset) is that the micromounter is apt to have a larger number of specimens, and he/she is likely to be a species collector. Finally, no matter how carefully one trims, the micromounter is apt to have more than one species per catalogued specimen in the collection. A computer could help with each of these areas. The process of identification has always been easier when there is more information available. A computer is capable of providing and managing information in a logical and orderly manner. The storage and retreival of computerized information to help in the process of mineral identification is only limited by your imagination and budget. It is inconceivable that I should have several thousand cabinet-size specimens in my home without without some cramping of the occupants, but several thousand micro specimens will fit in an average size bureau. Whatever the cataloguing scheme, you never succeed in finding all of a particular mineral, locality or chemical classification. A good computer system would not be bound by these traditional physical storage and retrieval problems. A computer would be able to produce lists of catalogued specimens by any criteria that you could ask for identifying a physical locality for each specimen. Likewise, the multiple species per catalogued specimen becomes a trivial problem for a computer to store and retrieve. A computer could eliminate the need to keep multiple catalogue cards or multiple listings of catalogued specimens and could produce a current wish list of a particular group of minerals that you might be seeking.

The purpose of this article is to inform the micromounter, in particular, why computers might be of interest to you, and what you might be able to do if you had one. Thousands of computers are sold every day. They come from a variety of manufacturers and in a variety of sizes. They cost as little as you are willing to spend and as much as you can afford. Whether you are talking about "personal" computers or "main frame" computers, they all consist of three parts. These are: hardware, software and peripherals. The hardware can be thought of as analogous to the human body; the software to the human brain, and the peripherals to the galoshes that keep your feet dry on a rainy day. The hardware is the central processing unit (CPU); the software is the programs that run on the CPU, and the peripherals are the printers, disk drives, game paddles, etc. Computers are purchased for various reasons. For some people it's a matter of ego; for others it's to play games. Some others have business applications that they desire to do, such as text processing or balancing a check book. Still others wish to eliminate routine, boring tasks, make quicker calculations, store large amounts of information in complex ways, etc. Whatever you think your reasons might be, try to isolate them into activities which can be done, to expand into activities you might like to try and to give consideration to what friends or family might want to do.

The process of choosing, buying and getting started with the right computer is difficult, but it can be reduced to a simple set of guidelines. Here is an idea of what I mean:

a. Get a good grip on any ideas of what you would like to do. Figure out how big your ideas are and what kinds of specialized stuff you would like to do, e.g.,the storage of the Encyclopedia of Minerals in the computer, or the drawing of graphs of all the specific gravities of minerals from a given locality.
b. Find yourself a good, reputable, stable computer store and a clerk who knows what he/she is talking about, one who is still capable of talking to you in an understandable language. Seek out the best service; not necessarily the best price.
c. Open up to your friend, the clerk, and tell him/her what it is that you plan to do. Then, together choose the software that will do 90% of what you desire to do. Do not presume that you will be able to write your own customized software, even after you have had a considerable amount of training.
d. Together with your new friend choose the hardware on which the software will run. Aim for hardware that is expandable, hardware with a good reputation from a manufacturer that is not likely to change his products overnight or go out of business. Choose your peripherals so that they are compatible with the hardware. Make certain that the CPU is configured to take advantage of these peripherals. For example, a graphics board is often needed to work a graphics printer.
e. Find out how much all of this will cost. Like the mineral hobby, computers can eat as much money as you are willing to give them. You might want to cut back on the ideal system and expand into this ideal system at some future time.
f. Plan to spend time with your new "hobby". The time that you are willing to devote to it is directly proportional to the value that you will get from it. Take any training courses that are offered. Sign up for as many courses as you need or can afford. Most of all, don't lose contact with your friend, the clerk. Commit him/her to helping you as part of the purchase arrangement.
g. Get some training, get some practice, experiment, play and learn. Soon you will be helping others with their computer decisions and problems.

Now that you have been booted into the area of computers, let me describe some of the pitfalls that we micromounters will discover as we build our information-based systems. First, some terms need to be defined. A "file" is a collection of complete units that are uniformly held together. I can compare this to all the cards of my card catalogue, or maybe just all of the cards that pertain to a particular locality. A "record" is a single, complete unit, for example, a single card from my card catalogue. A "field" is an information element within a record. For example: color, date acquired and catalogue number are all fields of each single card within my card catalogue. A "Database System" is a series of files and programs in which aggregate information on a subject is organized and stored, from which reports and interactive inquiry can be prepared.

In order for computerized information to be of any use, fields must contain consistent information throughout the collection of records. The field "color" must not have specific gravity in it. All of the records of a file must contain the same fields, and each of these fields must be maintained in the same relative position within these records. This probably seems simplistic, but mineral terminology is apt to mean slightly different things to different people. Minerals are described by varieties, series, groups, polymorphs, by their associations and in comparison with other minerals. You must take care to correctly use mineral terminology if you intend to be understood by your colleagues. With computerized information, even slight inconsistency will produce unexpected results.

Allow me to expand upon this predicament to include the functionality of the information system. It is inadvisable to ask your card catalogue to substitute for your <u>Glossary of Mineral Species</u>. Copying information for each occurrence of a species in the catalogue would be time consuming, redundant and disposed toward error. It is necessary, however, to duplicate certain pieces of information, such as the correct spelling of the mineral name. Generally, if you separate the information needed to catalogue a specimen from the information needed to idnetify a specimen, you will reduce the risk of having potentially ambiguous information.

You must make a determination of what is required so that each information retrieval and storage system works, is useful and is cost effective. One of the first lessons that you will learn is the importance of uniquely identifying all the records of a file. Whether it is a unique record number or a unique name field (numbers are sometimes better than names), all records must have a unique identifier, otherwise, a computer will not be able to retrieve any records. To be a useful system, the system should be designed to do specific tasks. For example, if you do X-ray analysis of minerals, then you might want to store information on the X-ray diffraction lines of each mineral. If chemistry is a blur to you, then maybe you should not store the mineral's chemical formula. There are trade-offs to consider with the storage of information. With more information, information retrieval is apt to be slower, and more disc storage will be used. A guideline for disk storage is as follows:

> One character is a "byte". The "K" number that you often see (as in 64K) refers to one thousand bytes. A "mega"byte refers to a million bytes. When you are planning your information disk sotrage needs, choose the largest useable size, in characters, for each field of the record. Add these fields of the record together to get a record size. Multiply this number

times the potential number of records and you will have a good approximation of your total disk storage needs.

When you have chosen a database system package to do this information storage and retrieval for you, consult with the clerk to determine your actual storage needs.

Let me describe a hypothetical cataloguing system that I might use, although each computer application should be tailored to an individual's needs. I always start this process by defining the fields and their size. Then I combine the fields into records. This is what my record might look like:

*Catalogue Number	10 characters
Mineral Name	30 characters
*Reference Number	9 characters
Locality Name	30 characters
Aquisition Date	11 characters
*Color	10 characters
	----------
	100 characters per record

Potentially, I will have 6000 records. This means that my disk space requirements for this file will be 600K bytes. If I used a database system package, the storage requirements would be different and would vary from package to package. I have marked certain fields with an asterisk; these fields require some explanation. The "catalogue number" contains a main part which refers to the actual specimen and a sub-number which I shall use to refer to a particular species on a multiple species specimen. The"reference number" refers to another file, book or index which will tell me specific information about the mineral, for example - specific gravity, crystal shape, chemical formula, etc. I have mentioned a file, book or index as possible places for this reference to exist. It is probable, however, that a combination of manual files, like a book or index file, will already be part of a reference system. There is no reason not to continue to use the systems that work and with which you are comfortable. Computers should be used to store information that is cumbersome or complex and computers work well with manual systems. The "color" field is put in here to demonstrate that stored information should be flexible and reflect the personal preferences of the person who is using this file. Let's say that I am fussy about colors. I am concerned that I should be able to retrieve from my catalogue each color variation of a mineral at a given locality. All those weloganites - yellow, white, water-clear, etc.- will be identified in the catalogue by this additional piece of information. This additional piece of information will help me to manage my collection by allowing me to look at colors throughout my catalogue. You might also assume that I am fussy about the names of these colors. Nothing ever gets entered into the"Color" field of my records unless the name of the color exists in my table of colors. It would be reasonably easy to modify the overall effect and use of this file by allowing for some significant piece of information (e.g. crystal system, specific gravity, etc.) to help you with your cataloguing process.

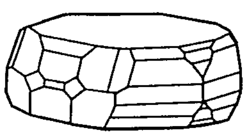
Of course, this file was created principally for the purpose of this article. You should decide what is appropriate for your cataloguing system and how large each field should be. I want my system to produce 3 by 5 index cards (for archival use only), with listings of minerals by locality, by alphabetical order by mineral name and by their reference numbers. Think about the functions you would want from your computerized cataloguing system.

If you want to build a tool for the identification of micro minerals, you would probably want to use a similar system-building methodology. Try this one:

a. Identify the functions that are important to your system.
b. Identify the necessary fields and decide which fields will require some standardization. Carefully plan the maximum sizes of each of these fields.
c. Identify the fields that will logically group together into records. Try to avoid redundancy of information. It may help to isolate some of the functions and relate them to specific records.
d. Build the functions that you require (listings, labels, etc.). Try them out with a little bunch of information. Re-adjust your system if you feel it is necessary.
e. Load up all the information and use it!

Consider very carefully how you would build a system to idenify minerals and you will notice that mineral identification is a very complex process. I think it would be possible to do a very sophisticated mineral identification with specialized hardware and software. You might be able to create tools for learning. Perhaps you would want a table that showed the paragenisis of a traprock formation or a mechanism to determine all of the associations of a given mineral species! The possibilities are endless. The uses of a computer are unlimited. If you decide to try your luck with a computer, seek help from a friend. Like mineral collecting, computing is a hobby where you can learn from your friends and enjoy some company while you both expand your knowledge.

Bob is a systems analyst for the Lotus Development Company. He enjoys combining his professional computer expertise with his hobby as a species collector.



SELECTED PUBLICATIONS ON THE MINERALS OF FRANKLIN - STERLING HILL, NJ

This list is not comprehensive, but includes important publications, even though out of date, and periodicals for their value in keeping up to date. The latest available information on cost and availability is given when possible.

Baum, J.L. (1973) "Three Hundred Years of Mining in Sussex County, New Jersey", Sussex County Historical Society, Newton, NJ 07860. For those interested in the history of the mines. $2.00 postpaid (14 pages).

Cook, D.(1973) "Recent Work on the Minerals of Franklin and Sterling Hill, New Jersey", Mineralogical Record, 4:62

Dunn, P.J. (1979) "Contributions to the Mineralogy of Franklin and Sterling Hill, New Jersey", Mineralogical Record, 10:360

Franklin-Ogdensburg Mineralogical Society, "The Picking Table", the official magazine of the Society, issued twice a year with membership ($10 individual, $15 family). Send dues to the Treasurer, 410 Chester Avenue, Moorestown, NJ 08057.

Frondel, C. (1972) "The Minerals of Franklin and Sterling Hill": a Checklist, John Wiley & Sons, New York. Out of Print.

Kushner, E.F. (1974) "A Guide to Mineral Collecting at Franklin and Sterling Hill, New Jersey". Out of Print.

Palache, C. (1935) "The Minerals of Franklin and Sterling Hill, New Jersey" USGS Professional Paper 180. This is a classic paper now out of print, but available as a reprint for $7.00 from the Treasurer of the Franklin-Ogdensburg Mineralogical Society (see above).

Parker, F.J. and J. Troy (1982) "Arsenate Minerals of Sterling Hill Mine: An Overview", Mineralogical Record, 13:35

Peters, T.A., R. Koestler, J.J. Peters and C.H. Grube (1983) "Minerals of The Buckwheat Dolomite, Franklin, New Jersey", The Mineralogical Record, 14:183.

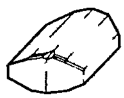
Rocks and Minerals (1982) The entire issue of volume 57, number 5 is devoted to Franklin-Sterling Hill. Heldref Publications, 4000 Albermarle Street NW, Washington, DC 20016. $5.00 for back issues. $19/year by subscription.

Wilkerson, A,S. (1962) "Minerals of Franklin and Sterling Hill, New Jersey" Maps and Publication Sales Office, Bureau of Collections and Licensing, CN-402, Trenton, NJ 08625. $3.00 payable to the Treasurer, State of New Jersey. (Old but useful at the price).

Specific Minerals

Papers on the following minerals have appeared in The Mineralogical Record. They are arranged in alphabetical order, followed by author, date, volume and page number.

Allactite Dunn, P.J. (1983) 14:251
Alleghanyite (Highly Magnesian) Peterson et al (1984) 15:299
Ganomalite Dunn, P.J. (1979) 10:47
Hodgkinsonite Dunn, P.J. and R.C. Bostwick (1982) 13:229
Holdenite Dunn, P.J. (1981) 12:373
Ogdensburgite Dunn, P.J. (1981) 12:369
Pyroaurite Dunn, P.J. and P.B. Leavens (1981) 12:371
Pyrobelonite Dunn P.J. (1983) 14:203
Sjogrenite Dunn, P.J. and P.B. Leavens (1981) 12:371
Tilasite Parker, F.J. and T.A. Peters (1978) 9:385
Zincite (Light Green) Dunn, P.J. (1979) 10:45



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