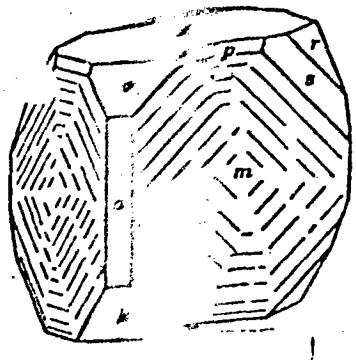

CERUSSITE

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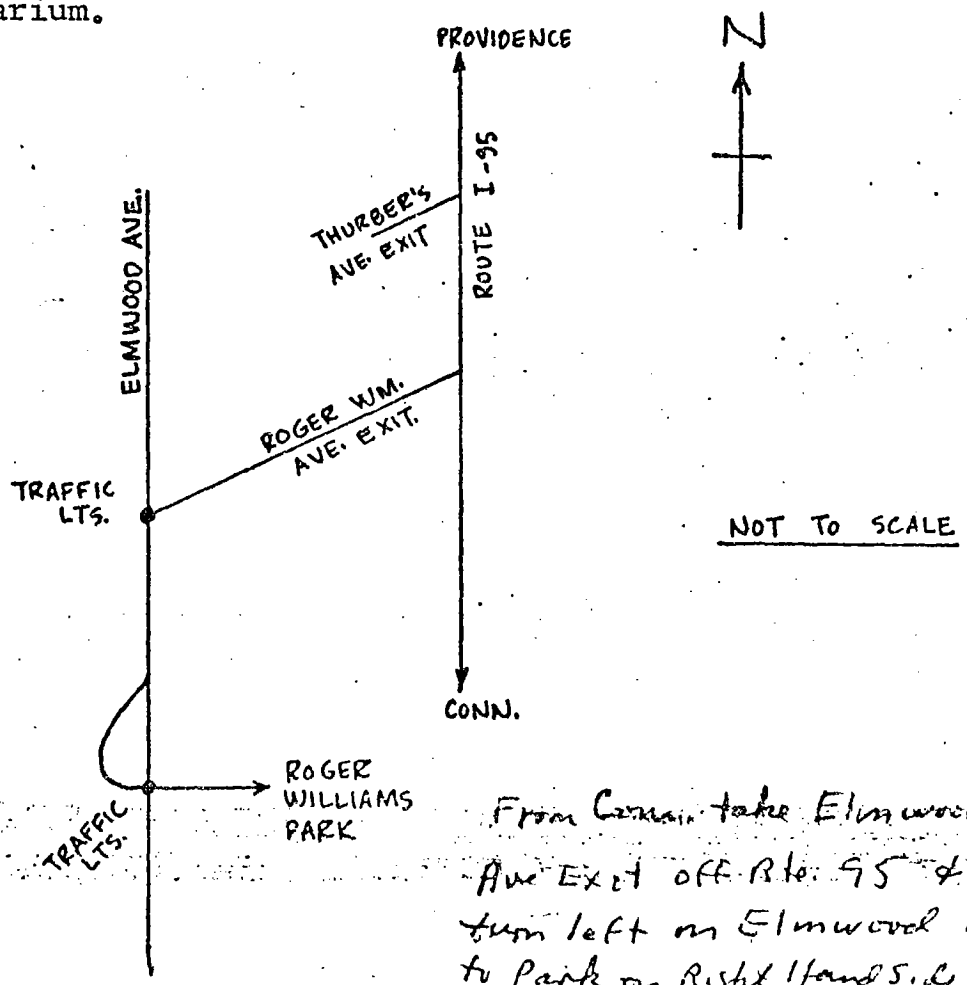
NEWSLETTER #~~53~~ 53

Tuesday March 11, 1980
~~October 19, 1978~~

The next regular meeting of the Micromounters of New England will be held on Saturday, ~~November 4, 1978~~ March 22, 1980, in the Museum/Planetarium Building #6, on the grounds of Roger Williams Park, in Cranston, RI. There is a small mineral collection in the museum, which will be open. Once you enter the Park off Elmwood Avenue, follow the small signs to the Museum/Planetarium.



From Cranston take Elmwood Ave Exit off Rte. 95 & turn left on Elmwood Ave to Park on Right Hand S.C.

AIDS TO MINERAL IDENTIFICATION

SPECIFIC GRAVITY: The ratio of the weight of a mineral to the weight of an equal volume of water.

SG	Representative Minerals
1 - 2	Borax and most water-soluble minerals.
2 - 2½	Sulfur, graphite, opal, gypsum, most zeolites, soft minerals.
2½ - 3	Quartz, feldspars, talc, beryl, calcite, aragonite, micas.
3 - 3½	Fluorite, apatites, epidote, tourmalines, pyroxenes, amphiboles, many phosphates and silicates.
3½ - 4	Garnets, topaz, diamond, siderite, sphalerite, many silicates.
4 - 4½	Corundum, rutile, barite, goethite, chalcopyrite.
4½ - 5	Marcasite, molybdenite, covellite, other sulfides and sulfosalts.
5 - 6	Pyrite, magnetite, hematite, heavy metal oxides, sulfides, sulfosalts.
6 - 7	Wulfenite, vanadinite, mimetite, uraninite.
7 - 8	Galena, pyromorphite.
Over 8	Native metals.

Minerals of non- metallic luster are generally less than 4½, those over 4½ have metallic, submetallic, or adamantine luster.

TESTS FOR SPECIFIC GRAVITY

WEIGHING METHODS: The weight of the mineral and the weight or volume of the water which it displaces are obtained.

Beam Balance. The specimen is weighed in ar, then suspended in water from the balance beam and reweighed. The difference in weight is equivalent to the volume of water displaced.

Jolly Balance. The relative weights of the specimen in air and in water are obtained by suspending the specimen from a spring and measuring the vertical displacementproduced in each case.

Pycnometer. Using a specially designed bottle, which assures a reproducible capacity of water, the weight of the mineral and the weight of water displaced by it are obtained through a series of weighings. (Useful for small specimens, fragments, powders, and sands).

Liquid Displacement. The specimen is weighed, then placed in a graduated cylinder partially filled to aaknown volume. The increase in volume of water is equivalent to the volume of the mineral. (Useful mostly for larger specimens.)

JWC:1/80

HEAVY LIQUIDS: A mineral will float on the surface of a liquid heavier than itself, sink in a lighter one, and be suspended beneath the surface of a liquid of identical gravity.

Method of Matching Liquids. The mineral is placed in a liquid on which it floats, and a lighter miscible liquid added until the specimen just starts to sink. The specific gravity of the resulting matching liquid mixture is then obtained either by weighing a known volume, by using a Westphal or specific gravity balance, by use of solids of known gravity, or by measuring the refractive index, which changes in proportim to the relative volumes of the two liquids. If a known volume of the heavier liquid is used, and the volume of the added liquid is accurately measured, the specific gravity may be calculated or read from a prepared chart.

Sink-Float Method. The specimen is placed in a liquid of known specific gravity and its action observed. If it floats, it is then placed in successively lighter liquids until it sinks; if it sinks, it is placed in successively heavier liquids until it floats. The specific gravity then lies between that of the liquid in which it sinks, and that of the liquid in which it floats.

USEFUL LIQUIDS. There are two general classes of liquids which are commonly used in estimating the specific gravity of minerals:

1. Clerici Solution or TMF is a water solution containing thallium malonate and thallium formate, two salts of high specific gravity. The highest practical gravity obtainable is about 4.2, which may be diluted with water to any desired lower value. Above 4.2 the liquid becomes syrupy and tends to crystallize out of solution. Although TMF may be used in the matching liquid method, the sink-float method is to be preferred. Thallium salts are toxic, and this method keeps handling to a minimum. A set of liquids of small volume diluted with water to produce a range of 2.0 to 4.0, in increments of 0.2 is recommended. Few minerals have a gravity of less than 2, and of these most are water-soluble, and thus could not be measured. Specimen chips may be handled with tweezers to prevent contact of the fingers with the liquids. Chips may often be obtained even from thumbnail or micro specimens with little damage to the parent specimen and observed under magnification.

2. Organic Liquids have often been used in the study of minerals. These include methylene iodide with a gravity of 3.32, Acetylene tetrabromide (or s-tetrabromoethane) 2.96, and bromoform 2.89. They are usually diluted with acetone or alcohol to produce solutions of lower gravity, however the specific gravity of solutions so prepared will change fairly rapidly due to the volatility of the solvents. They should be handled carefully and with good ventilation, as they are also toxic, and the lighter solvents used for dilution may present a fire hazard. Organic liquids would be the method of choice where water-soluble minerals are being examined.

JWC: 1/80

MOHS SCALE OF HARDNESS (Reference minerals are listed in capital letters)

1 - 2 TALC, graphite, molybdenite, realgar, orpiment, montmorillonite and other clay minerals, most water-soluble minerals.

2 - 3 GYPSUM, native metals, (except "brittle" micas), chlorites, sulfides and sulfosalts (exceptions under 3 & 5), many borax minerals.

3 - 5 CALCITE and other carbonates, barite and other sulfates, many sulfides and sulfosalts (exceptions under 2 & 5)

4 - 5 FLUORITE, many phosphates, some zeolites.

5 APATITE, pyrite, arsenopyrite, marcasite, many oxides, many silicates including amphiboles & pyroxenes (exceptions: talc, micas, chlorites, clay minerals, and zeolites are usually softer).

6 ORTHOCLASE and other feldspars, many oxides, zircon, garnets, and many other silicates (exceptions under 5).

7 QUARTZ, beryl, tourmaline, spodumene, epidote, many other silicates, especially those containing aluminum (exceptions under 5)

8 TOPAZ, spinel.

9 CORUNDUM.

10 DIAMOND.

TESTS FOR HARDNESS

	TALC 1	GYPSUM 2	CALCITE 3	FLUORITE 4	APATITE 5	ORTHOCLASE 6	QUARTZ 7	TOPAZ 8	CORUNDUM 9	DIAMOND 10
Scratched by thumbnail	X									
Scratches plastic box		X	X	X	X	X	X	X	X	X
Scratches copper penny			X	X	X	X	X	X	X	X
Scratches nickel coin				X	X	X	X	X	X	X
Scratched by needle	X	X	X	X	X					
Scratches glass					X	X	X	X	X	X
Scratches orthoclase							X	X	X	X
Scratches quartz								X	X	X
Scratched by diamond	X	X	X	X	X	X	X	X	X	
Scratched by anything										X

Any mineral will scratch a mineral of lower hardness, and will be scratched by a mineral of greater hardness.

rev 1/80

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