

# 45th ANNUAL

*Franklin - Sterling*

## GEM & MINERAL SHOW

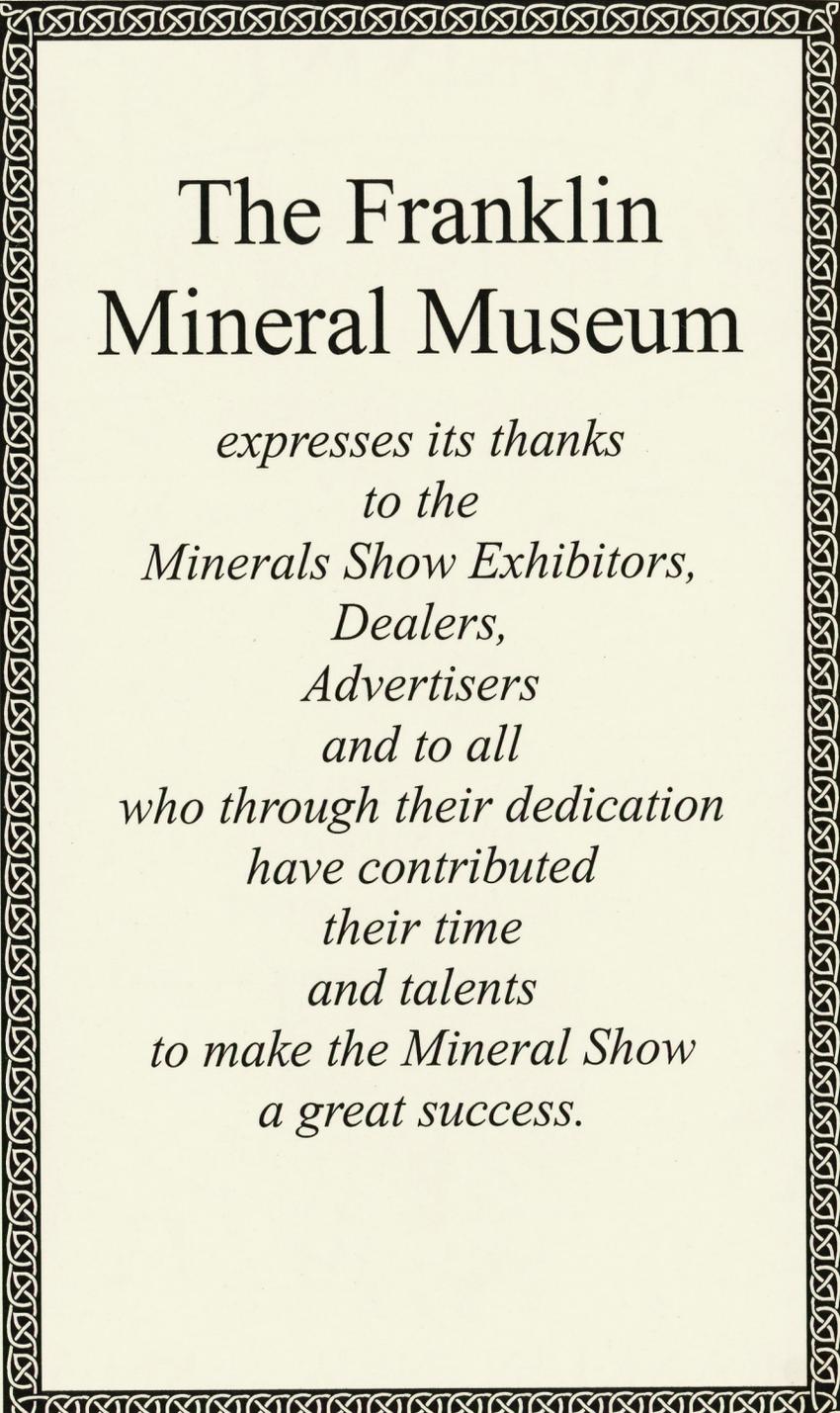
**2001**

SATURDAY, SEPTEMBER 29th • 9-6  
SUNDAY, SEPTEMBER 30th • 10-5

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**FRANKLIN, NEW JERSEY**  
*The Fluorescent Mineral Capital of the World*



# The Franklin Mineral Museum

*expresses its thanks  
to the  
Minerals Show Exhibitors,  
Dealers,  
Advertisers  
and to all  
who through their dedication  
have contributed  
their time  
and talents  
to make the Mineral Show  
a great success.*

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## - DEDICATION -



*Photo by Dan Durham*

### LEE LOWELL

Lee Lowell has been around the Franklin scene for 30 years or so. He spent the beginnings of his collecting career incognito. A humble personality who has a terrific eye for beautiful minerals and an insatiable appetite for local history he is an important asset to Franklin-Sterling mineralogy starting with his curatorial assistance to and long-term friendship with Mr. Ewald Gerstmann. Presently Lee is a member of the Franklin Mineral Museum Board of Trustees Executive Committee and has served as museum treasurer since 1992. Lee was just appointed co-chairman of the museum's show committee, and has been active on the show committee for many years. In his spare time Lee assists the museum curatorial department and is especially helpful with various projects on weekends and holidays. He is a past president, and trustee of the Franklin-Ogdensburg Mineralogical Society and has devoted his time unselfishly to join the effort to preserve the zinc mining legacy of Franklin and Ogdensburg, New Jersey. Lee's real job is with the United States Department of Defense where he works as an engineer.

Lee has a wide range of other interests such as Civil War history and collects books and memorabilia on the subject. He enjoys going to Civil War battle reenactments. When taking a break from his interests in war and rocks, Lee enjoys music. The Boston Pops are among his favorite bands. Because of his wide range of interests, avid reading and life experiences, Lee can speak intelligently on many topics. He is truly a remarkable individual. Franklin is fortunate to have Lee Lowell as a volunteer and benefactor. From the Franklin Mineral Museum Board of Trustees and others who know you, thanks.

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## Fluorescent Minerals of Franklin and Sterling Hill, N.J.

A 2001 check-list based on observations by Richard C. Bostwick, with species additions\* and midwave (MW) fluorescence observations by John Cianciulli and Claude Poli.  
FL=fluoresces; PH= phosphoresces; SW= shortwave ultraviolet radiation (254 nm);  
MW= midwave or midrange ultraviolet radiation (approx. 300 nm);  
LW= longwave ultraviolet radiation (350 or 366 nm).

These descriptions are necessarily brief and hence simplistic. The fluorescent response listed first is the typical one and the UV wavelength mentioned with it is usually the wavelength for which the fluorescent response is strongest. Many minerals fluoresce under SW, MW, and LW. Unusual fluorescent responses are listed in parentheses. Fluorescent intensity and subtle differences in hue are not mentioned.

While mineral fluorescence is a powerful tool for rapid mineral identification, it should be used in conjunction with other identification techniques.

- Albite:** FL red SW  
**Aragonite:** FL/PH cream LW  
(FL green SW) (bright blue-green MW)  
**Barite:** FL cream SW (FL/PH yellow SW/LW.  
FL white SW and pale green LW) bright cream MW  
**Barylite:** FL violet SW, conspicuous under iron arc  
**Bassanite:** FL/PH violet SW  
**Bustamite:** FL cherry red LW, dull red MW  
**Cahnite:** FL/PH cream SW  
**Calcite:** FL orange-red SW with brief red-orange PH (also  
FL pink, orange, cream, white, green, blue yellow, violet  
etc.) (cream, orange, red crimson, blue green, blue MW)  
**Canavesite:** FL/PH violet LW  
**Celestine:** FL/PH cream LW (FL violet SW)  
**Cerussite:** FL yellow LW  
**Chabazite:** FL green SW, green MW  
**Charlesite:** FL pale blue SW, coated with cream-FL  
gypsum, blue MW  
**Chondrodite:** FL yellow, yellow-orange SW  
**\*Clinochrysoile:** FL yellow-brown LW, dull brown SW,  
less MW  
**Clinohedrite:** FL/PH orange SW, pale orange MW  
**Corundum:** FL cherry-red LW  
**Cuspidine:** FL orange-yellow SW, with brief orange-red  
PH, dull violet MW  
**Datolite:** FL cream SW  
**Diopside:** FL blue SW, cream LW, yellow-orange MW  
**Dypingite:** FL/PH blue SW/LW, blue MW  
**Epsomite:** FL cream LW, violet MW  
**Esperite:** FL lemon-yellow SW, greenish yellow MW  
**Fluorborite:** FL cream SW  
**Fluorapatite:** FL orange or blue SW (FL "peach"SW) dull  
orange and peach MW  
**Fluorapophyllite:** FL/PH white SW  
**Fluorite:** FL/PH blue-green SW/LW, FL violet-blue LW (FL  
white LW) blue-green MW, (also yellow-cream SW,  
less intense yellow-cream LW)  
**Guerinite:** FL/PH white SW  
**Gypsum:** FL/PH cream, pale blue, pale violet SW. pale  
yellow MW  
**Hardystonite:** FL violet to violet-blue SW/LW, blue violet  
and lavender MW  
**Hedyphane:** FL cream, orange SW, orange brown MW  
**Hemimorphite:** FL/PH white LW, (FL green SW, lime  
green, cream to yellow MW)  
**Hodgkinsonite:** FL deep cherry red LW  
**Humite:** rarely FL pale yellow SW  
**Hyalophane:** FL red SW, tan MW  
**Hydroalcalite:** FL cream LW  
**Hydroxapophyllite:** FL/PH weak white SW  
**Hydrozincite:** FL/SW blue, moderate white, blue with  
yellow margins MW  
**Johnbaumite:** FL orange SW, burnt orange, orange MW  
**Junitoite:** FL pale yellow LW  
**Magnesiohornblende:** FL greenish-blue SW  
**Manganaxinite:** FL red SW, moderate red MW  
**Margarite:** FL yellow SW/LW, cream yellow MW  
**Margarosanite:** FL blue & red SW, (FL orange LW),  
bright red, bright red with orange streaks, dull pink  
MW  
**Marialite:** FL yellow SW, pink LW  
**Mcallisterite:** FL cream SW  
**Meionite:** FL pinkish-red SW, dull peach MW (also FL  
pink, orange, yellow, cream LW/SW)  
**Meta-ankoleite:** FL green SW  
**Metalodevite:** FL green SW  
**Microcline:** FL blue or red SW, grayish-green, dull  
powder blue MW  
**Minehillite:** FL violet SW, violet blue MW  
**Monohydrocalcite:** FL green SW + white PH, bright  
green MW  
**Nasonite:** FL pale yellow SW, yellow cream MW  
**Newberyite:** FL cream SW  
**Norbergite:** FL yellow SW, dull orange MW  
**Pargasite:** FL greenish-blue SW  
**Pectolite:** FL/PH orange SW, dull peach, dull orange  
MW  
**\*Pharmacolite:** FL weak violet SW  
**Phlogopite-1 M:** FL yellow SW, dull yellow MW  
**Picropharmacolite:** FL/PH white LW  
**Powellite:** FL yellow SW, bright yellow MW  
**Prehnite:** FL orangish-pink SW, dull pink to yellow MW  
**Quartz:** FL yellow or green SW  
**Roebingite:** FL red SW, with 1 brief, red-orange PH,  
dull pink, bright cream MW  
**Samfowlerite:** FL weak red SW  
**Scheelite:** FL yellow, blue SW, pale yellow, yellow  
orange MW  
**Smithsonite:** FL/PH white SW  
**Sphalerite:** FL/PH orange, yellow-orange, orange-  
yellow, and blue LW, pumpkin MW  
**Spinel:** FL cherry-red LW  
**Strontianite:** FL violet SW/LW  
**Talc:** FL cream SW, dull green MW  
**Thomsonite:** FL cream SW  
**Tilasite:** FL yellow SW  
**Titanite:** FL yellow-orange SW  
**Tremolite:** FL blue SW. (yellow LW)  
**Turneaureite:** FL orange SW, pumpkin orange, dull  
orange MW  
**Uranospinitite:** FL green SW  
**Uvite:** FL yellow SW  
**Willemite:** FL/PH green SW, (FL/PH yellow, greenish-  
yellow, orange, pale blue SW) green MW  
**Wollastonite:** FL orange to yellow SW, variable PH  
**Xonotlite:** FL violet SW, dull violet, powder blue MW  
**Zincite:** FL yellow LW/SW, bright yellow to white MW  
**Zircon:** FL orange SW  
**Znucalite:** FL green SW, neon green MW

# MINERAL SPECIES FOUND AT FRANKLIN-STERLING HILL, NEW JERSEY

Mineral Species List Updated Fall of 2001

Courtesy of the Franklin Mineral Museum Inc.

Acanthite	Ag <sub>2</sub> S	Cyanorichite	Cu <sup>2+</sup> Al <sub>2</sub> (SO <sub>4</sub> )(OH) <sub>2</sub> ·2H <sub>2</sub> O
Actinolite	C <sub>23</sub> (Mg,Fe <sup>2+</sup> ) <sub>7</sub> Si <sub>20</sub> (OH) <sub>2</sub>	Datolite	Ca <sub>2</sub> B <sub>2</sub> Si <sub>2</sub> O <sub>8</sub> (OH) <sub>2</sub>
Adamite	Zn <sub>2</sub> (AsO <sub>4</sub> )(OH)	Desclozite	PbZn(V <sub>2</sub> O <sub>7</sub> )(OH)
Adelite	CaMg(AsO <sub>4</sub> )(OH)	Devilline	CaCu <sup>2+</sup> (SO <sub>4</sub> ) <sub>2</sub> (OH) <sub>2</sub> ·3H <sub>2</sub> O
Aegirine	NaFe <sup>3+</sup> Si <sub>2</sub> O <sub>6</sub>	Digenite	Cu <sub>2</sub> S
Akrochordite	Mn <sup>2+</sup> Mg(AsO <sub>4</sub> ) <sub>2</sub> (OH) <sub>4</sub> ·4H <sub>2</sub> O	Diorite	CaMgSi <sub>2</sub> O <sub>6</sub>
Albite	NaAlSi <sub>3</sub> O <sub>8</sub>	Djupelite	Cu <sub>2</sub> Si <sub>16</sub>
Allacite	Mn <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> (OH) <sub>2</sub>	Dolomite	CaMg(CO <sub>3</sub> ) <sub>2</sub>
Allanite-(Ce)	(Ce, Ca, Y <sub>2</sub> , Al, Fe <sup>3+</sup> , Fe <sup>2+</sup> )(SiO <sub>4</sub> ) <sub>2</sub> (OH)	Domeykite	Cu <sub>2</sub> As
Alleganyite	Mn <sup>2+</sup> (SiO <sub>4</sub> ) <sub>2</sub> (OH) <sub>2</sub>	Dravite	NaMg <sub>2</sub> Al <sub>2</sub> (BO <sub>3</sub> ) <sub>2</sub> Si <sub>4</sub> O <sub>11</sub> (OH)
Almandine	Fe <sup>3+</sup> Al <sub>3</sub> (SiO <sub>4</sub> ) <sub>3</sub>	Dufite	PbCu(AsO <sub>4</sub> )(OH)
Analcime	Na[AlSi <sub>3</sub> O <sub>7</sub> ]·H <sub>2</sub> O	Dypingite	Mg <sub>2</sub> (CO <sub>3</sub> )(OH) <sub>2</sub> ·5H <sub>2</sub> O
Anandite	Ba <sub>2</sub> Fe <sup>2+</sup> Fe <sup>3+</sup> Si <sub>3</sub> O <sub>10</sub> S(OH)	Edenite	NaCa <sub>2</sub> Mg <sub>2</sub> Si <sub>2</sub> Al <sub>2</sub> O <sub>22</sub> (OH) <sub>2</sub>
Anatase	TiO <sub>2</sub>	Epidote	Ca <sub>2</sub> (Fe <sup>2+</sup> Al) <sub>2</sub> (SiO <sub>3</sub> ) <sub>2</sub> (OH)
Andradite	Ca <sub>3</sub> Fe <sup>2+</sup> Si <sub>3</sub> (SiO <sub>4</sub> ) <sub>3</sub>	Epsomite	MgSO <sub>4</sub> ·7H <sub>2</sub> O
Angelite	PbSO <sub>4</sub>	Erythrite	Co <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·8H <sub>2</sub> O
Anhydrite	CaSO <sub>4</sub>	Esperite	PbCu <sub>2</sub> Zn <sub>2</sub> (SiO <sub>4</sub> ) <sub>2</sub>
Annabergite	Ni <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·8H <sub>2</sub> O	Euchroite	Cu <sup>2+</sup> (AsO <sub>4</sub> )(OH)·3H <sub>2</sub> O
Anorthite	CaAl <sub>2</sub> Si <sub>2</sub> O <sub>8</sub>	Eveite	Mn <sup>2+</sup> (AsO <sub>4</sub> )(OH)
Anorthoclase	(Na,K)AlSi <sub>3</sub> O <sub>8</sub>	Fayalite	Fe <sup>2+</sup> SiO <sub>4</sub>
Anterite	Cu <sup>2+</sup> (SO <sub>4</sub> )(OH) <sub>4</sub>	Feitknechtite	β-Mn <sup>2+</sup> O(OH)
Aragonite	CaCO <sub>3</sub>	Ferrihydrite	Fe <sub>2</sub> (Mg <sup>2+</sup> CO <sub>3</sub> ) <sub>2</sub> ·8H <sub>2</sub> O (?)
Arsenic	As	Ferrosulphomelane	(K,Nb <sub>2</sub> )(Fe <sup>2+</sup> Mg,Fe <sup>3+</sup> ) <sub>10</sub> (Si,Al) <sub>7</sub> (O,OH) <sub>216</sub> ·nH <sub>2</sub> O
Arseniosiderite	Ca <sub>2</sub> Fe <sup>2+</sup> Si <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·3H <sub>2</sub> O	Ferro-actinolite	Ca <sub>2</sub> Fe <sup>2+</sup> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>
Arsenopyrite	FeAsS	Ferro-xenite	Ca <sub>2</sub> Fe <sup>2+</sup> Al <sub>2</sub> BSi <sub>2</sub> O <sub>10</sub> (OH) <sub>2</sub>
Atacamite	Cu <sub>2</sub> Si <sub>2</sub> Cl(OH) <sub>2</sub>	*Ferrosilpnomelane	(K,Nb,Ca) <sub>2</sub> (Fe <sup>2+</sup> Mg,Zn) <sub>4</sub> (Si,Al) <sub>7</sub> (O,OH) <sub>216</sub> ·nH <sub>2</sub> O
Augite	(Ca,Na)(Mg,Fe,Al,Ti)(Si,Al) <sub>2</sub> O <sub>6</sub>	Fluclite	CaMn <sup>2+</sup> H <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·2H <sub>2</sub> O
Aurichalcite	(Zn,Cu) <sup>2+</sup> (CO <sub>3</sub> ) <sub>2</sub> (OH) <sub>2</sub>	Fluoborite	Mg <sub>2</sub> (BO <sub>3</sub> )(F,OH) <sub>2</sub>
Auriferite	(Mn <sup>2+</sup> Ag,Ca)Mn <sup>2+</sup> O <sub>7</sub> ·3H <sub>2</sub> O	Fluorapatite	Ca <sub>5</sub> (PO <sub>4</sub> ) <sub>3</sub> F
Austinite	CaZn(AsO <sub>4</sub> )(OH)	Fluorapophyllite	KCa <sub>2</sub> Si <sub>4</sub> O <sub>20</sub> (F,OH)·8H <sub>2</sub> O
Azurite	Cu <sub>2</sub> (CO <sub>3</sub> ) <sub>2</sub> (OH) <sub>2</sub>	Fluorite	CaF <sub>2</sub>
Bakerite	Ca <sub>2</sub> B <sub>2</sub> (BO <sub>3</sub> )(SiO <sub>4</sub> ) <sub>2</sub> (OH) <sub>2</sub> ·H <sub>2</sub> O	Forsterite	MgSiO <sub>3</sub>
Barnisterite	KCa(Fe <sup>2+</sup> ,Mn <sup>2+</sup> ,Zn,Mg) <sub>2</sub> (Si,Al) <sub>22</sub> O <sub>74</sub> (OH) <sub>16</sub> ·4-12H <sub>2</sub> O	Frasipointite	(Zn,Al) <sub>2</sub> (Si,Al) <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>
Barite	BaSO <sub>4</sub>	*Franklinfermatite	Ca <sub>2</sub> (Fe <sup>2+</sup> Al) <sub>2</sub> Mn <sup>2+</sup> Mn <sup>2+</sup> Zn <sub>2</sub> Si <sub>2</sub> O <sub>10</sub> (OH) <sub>4</sub>
Barium-pharmacosiderite	BaFe <sup>2+</sup> (AsO <sub>4</sub> ) <sub>2</sub> (OH) <sub>4</sub> ·14H <sub>2</sub> O	Franklinite	(Zn,Mn <sup>2+</sup> Fe <sup>2+</sup> Fe <sup>3+</sup> Mn <sup>2+</sup> ) <sub>2</sub> O <sub>4</sub>
Barylite	BaBe <sub>2</sub> Si <sub>2</sub> O <sub>7</sub>	*Franklinphillite	(K,Nb) <sub>2</sub> (Mn <sup>2+</sup> Zn,Mg,Fe) <sub>11</sub> (Si,Al) <sub>7</sub> (O,OH) <sub>216</sub> ·6H <sub>2</sub> O
Barysilite	Pb <sub>2</sub> Mn <sub>2</sub> (Si <sub>2</sub> O <sub>7</sub> ) <sub>2</sub>	Friedelite	Mn <sup>2+</sup> Mg,Zn <sub>2</sub> Si <sub>16</sub> O <sub>54</sub> (OH) <sub>16</sub>
Bassanite	2CaSO <sub>4</sub> ·H <sub>2</sub> O	Gageite-1tc	
Baumhauerite	Pb <sub>2</sub> As <sub>2</sub> S <sub>4</sub>	Gageite-2M	ZnAl <sub>2</sub> O <sub>4</sub>
Bementite	Mn <sup>2+</sup> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>18</sub>	Gahnite	PbS
Berthierite	FeSb <sub>2</sub> S <sub>4</sub>	Gaena	Pb <sub>2</sub> Ca <sub>2</sub> Mn <sup>2+</sup> Si <sub>2</sub> O <sub>13</sub>
Bianchite	(Zn,Fe <sup>2+</sup> )(SO <sub>4</sub> ) <sub>2</sub> ·6H <sub>2</sub> O	Ganomalite	(K,Nb) <sub>2</sub> (Mn,Al,Mg) <sub>10</sub> (Si,Al) <sub>12</sub> O <sub>32</sub> (OH) <sub>2</sub> ·8-9H <sub>2</sub> O
Biotite (series name)	K(Mg,Fe <sup>2+</sup> )(Al,Fe <sup>3+</sup> ) <sub>3</sub> Si <sub>3</sub> O <sub>10</sub> (OH,F) <sub>2</sub>	Ganophyllite	Zn,Be <sub>2</sub> (SiO <sub>3</sub> ) <sub>5</sub> S
Birnessite	Na <sub>4</sub> Mn <sub>4</sub> O <sub>7</sub> ·9H <sub>2</sub> O	Gentherite	Ni <sub>2</sub> As <sub>2</sub>
Bornite	Cu <sub>5</sub> FeS <sub>4</sub>	Gersdorffite	(Mg,Mn <sup>2+</sup> ) <sub>2</sub> Zn <sub>2</sub> Si <sub>2</sub> O <sub>10</sub> (OH) <sub>2</sub>
*Bostwickite	CaMn <sup>2+</sup> Si <sub>3</sub> O <sub>10</sub> ·7H <sub>2</sub> O	*Gerstmannite	CaMn <sup>2+</sup> SiO <sub>4</sub>
Brandite	Cu <sub>2</sub> (Mn <sup>2+</sup> ,Mg)(AsO <sub>4</sub> ) <sub>2</sub> ·2H <sub>2</sub> O	Glaucocrochite	(Co,Fe)As <sub>2</sub>
Breithauptite	Ni <sub>2</sub> Si <sub>2</sub>	Glaucodot	α-Fe <sup>2+</sup> (OH)
Bryochanite	Cu <sup>2+</sup> (SO <sub>4</sub> )(OH) <sub>4</sub>	Goethite	Fe <sup>2+</sup> (OH)
Brookite	TiO <sub>2</sub>	Gold	Au
Bruceite	Mg(OH) <sub>2</sub>	Goldmanite	Ca <sub>3</sub> (V,Al,Fe <sup>3+</sup> ) <sub>2</sub> (SiO <sub>4</sub> ) <sub>2</sub>
Bultfonteinite	Ca <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH,F) <sub>2</sub>	Graphite	C
Bustamite	(Mn <sup>2+</sup> ,Ca) <sub>2</sub> Si <sub>2</sub> O <sub>7</sub>	Greenockite	CdS
Cabnite	Ca <sub>2</sub> B(AsO <sub>4</sub> )(OH) <sub>4</sub>	Grossular	Ca <sub>3</sub> Al <sub>2</sub> (SiO <sub>4</sub> ) <sub>3</sub>
Calcite	CaCO <sub>3</sub>	Groutite	Mn <sup>2+</sup> (OH)
Canavassite	Mg <sub>2</sub> (CO <sub>3</sub> )(HBO <sub>3</sub> ) <sub>2</sub> ·5H <sub>2</sub> O	Guerinite	Ca <sub>2</sub> H <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·9H <sub>2</sub> O
Carrollite	Ca(Co,Ni) <sub>2</sub> S <sub>4</sub>	Gypsum	CaSO <sub>4</sub> ·2H <sub>2</sub> O
Caryophyllite	(Mn <sup>2+</sup> ,Mg) <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>4</sub>	Haidingerite	CaH <sub>2</sub> AsO <sub>4</sub> ·H <sub>2</sub> O
Celestine	StrSO <sub>4</sub>	Halorichite	Fe <sup>2+</sup> Al <sub>2</sub> (SO <sub>4</sub> ) <sub>2</sub> ·22H <sub>2</sub> O
Celsian	BaAl <sub>2</sub> Si <sub>2</sub> O <sub>7</sub>	Hancockite	(Pb,Cu,Sn)(Al,Fe <sup>2+</sup> ) <sub>2</sub> (SiO <sub>4</sub> ) <sub>2</sub> (OH)
Cerussite	PbCO <sub>3</sub>	*Hardystonite	Ca <sub>2</sub> ZnSi <sub>2</sub> O <sub>7</sub>
Chabazite-Ca	(Ca <sub>2</sub> ,K,Nb) <sub>4</sub> (Al <sub>2</sub> Si <sub>4</sub> O <sub>24</sub> ) <sub>12</sub> H <sub>2</sub> O	Hastingsite	NiCa <sub>2</sub> (Fe <sup>2+</sup> ,Fe <sup>3+</sup> ) <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>
Chalcoite	Cu <sub>2</sub> S	*Hauckite	(Mg,Mn <sup>2+</sup> ,Mg,Zn)Fe <sup>2+</sup> (SO <sub>4</sub> ) <sub>2</sub> (OH) <sub>2</sub> (OH) <sub>2</sub> (?)
Chalchophanite	(Mn <sup>2+</sup> ,Mg) <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>4</sub>	Hawleyite	Mn <sup>2+</sup> Mn <sup>2+</sup> O <sub>4</sub>
Chalcophanite	StrSO <sub>4</sub>	Hedenbergite	CaS <sub>2</sub>
Chalcopyrite	BaAl <sub>2</sub> Si <sub>2</sub> O <sub>7</sub>	Hedyphane	CaFe <sup>2+</sup> Si <sub>2</sub> O <sub>6</sub>
Chamosite	PbCO <sub>3</sub>	Hemimite	α-Fe <sub>2</sub> O <sub>3</sub>
*Chariteite	(Fe <sup>2+</sup> ,Mg,Fe <sup>3+</sup> )Al(Si <sub>3</sub> AlO <sub>10</sub> )(OH,OH) <sub>2</sub>	Heminorphite	Zn <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub> ·H <sub>2</sub> O
Chloritoid	Ca <sub>2</sub> (Al <sub>2</sub> Si <sub>2</sub> SO <sub>4</sub> ) <sub>2</sub> B(OH) <sub>4</sub> (OH,OH) <sub>2</sub> ·26H <sub>2</sub> O	*Hendricksite-1M	KZn <sub>3</sub> AlSi <sub>3</sub> O <sub>10</sub> (OH) <sub>2</sub>
*Chlorophoenicite	(Fe <sup>2+</sup> ,Mg,Mn) <sub>2</sub> AlSi <sub>2</sub> O <sub>10</sub> (OH) <sub>4</sub>	Hercynite	Fe <sup>2+</sup> Al <sub>2</sub> O <sub>3</sub>
Chondrodite	(Mn,Mg) <sub>2</sub> Zn <sub>2</sub> (AsO <sub>4</sub> )(OH) <sub>4</sub>	Heteroite	ZnMn <sup>2+</sup> O <sub>4</sub>
Chrysocola	(Mg,Fe <sup>2+</sup> )(SiO <sub>4</sub> ) <sub>2</sub> (F,OH) <sub>2</sub>	Heulandite-Na	(Na,Ca,K) <sub>4</sub> (Al <sub>3</sub> Al <sub>3</sub> Si <sub>2</sub> O <sub>21</sub> ) <sub>2</sub> ·24H <sub>2</sub> O
*Chrysocolla	(Cu <sup>2+</sup> Al) <sub>2</sub> H <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>4</sub> ·nH <sub>2</sub> O	Hexahydrite	MgSO <sub>4</sub> ·6H <sub>2</sub> O
*Clancillite	Mn <sup>2+</sup> (Mg,Mn <sup>2+</sup> ) <sub>2</sub> (Si <sub>2</sub> Zn <sub>2</sub> (OH) <sub>10</sub> ) <sub>2</sub> ·2-4H <sub>2</sub> O	*Höglinsönite	Mn <sup>2+</sup> Zn <sub>2</sub> (SiO <sub>4</sub> )(OH) <sub>2</sub>
Clinchlore	(Mg,Fe <sup>2+</sup> ) <sub>2</sub> Al(Si <sub>2</sub> AlO <sub>4</sub> )(OH) <sub>2</sub>	*Holdenite	(Mn <sup>2+</sup> ,Mg,Zn)(AsO <sub>4</sub> ) <sub>2</sub> (SiO <sub>4</sub> )(OH) <sub>2</sub>
Clinchrosyllite	Mg <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>	Huebnerite	Mn <sup>2+</sup> W <sub>2</sub> O <sub>4</sub>
Clinoclase	Cu <sup>2+</sup> (AsO <sub>4</sub> )(OH) <sub>2</sub>	Humite	(Mg,Fe <sup>2+</sup> ) <sub>2</sub> (SiO <sub>4</sub> )(F,OH) <sub>2</sub>
Clinohedrite	Ca <sub>2</sub> ZnSi <sub>2</sub> H <sub>2</sub> O	Hyalophane	(K,Ba)(Al,Al) <sub>2</sub> O <sub>4</sub>
Clinozoisite	(Mg,Fe <sup>2+</sup> )(SiO <sub>4</sub> )(F,OH) <sub>2</sub>	Hydrobacterolite	Zn <sub>2</sub> Mn <sup>2+</sup> O <sub>7</sub> ·H <sub>2</sub> O
Clinzoisite	Ca <sub>2</sub> Al <sub>2</sub> (SiO <sub>4</sub> )(OH)	Hydrotricalcic	Mg <sub>2</sub> Al <sub>2</sub> (CO <sub>3</sub> )(OH) <sub>16</sub> ·4H <sub>2</sub> O
Clinzoisite	CaMg <sub>2</sub> Al <sub>2</sub> Si <sub>2</sub> O <sub>10</sub> (OH) <sub>2</sub>	Hydroxypaphyllite	KCa <sub>2</sub> Si <sub>4</sub> O <sub>20</sub> (OH,F) <sub>2</sub> ·8H <sub>2</sub> O
Conicalchalcite	CaCu <sup>2+</sup> (AsO <sub>4</sub> )(OH)	Hydrozincite	Zn <sub>2</sub> (CO <sub>3</sub> ) <sub>2</sub> (OH) <sub>4</sub>
Connellite	Cu <sub>2</sub> Fe <sup>2+</sup> Cl <sub>2</sub> (SO <sub>4</sub> )(OH) <sub>2</sub> ·3H <sub>2</sub> O	Illite	K <sub>0.65</sub> Al <sub>2-4</sub> ClAl <sub>0.65</sub> Si <sub>3.35</sub> O <sub>10</sub> (OH) <sub>2</sub>
Copper	Cu	Ilmenite	Fe <sup>2+</sup> TiO <sub>3</sub>
Corundum	Al <sub>2</sub> O <sub>3</sub>		
Covellite	CuS		
Cryptomelane	K(Mn <sup>4+</sup> ,Mn <sup>3+</sup> ) <sub>2</sub> O <sub>16</sub>		
Cunningtonite	Mg <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>		
Cuprite	Cu <sub>2</sub> O		
Cuprobitrite	Cu <sub>2</sub> (Sb,Tl) <sub>2</sub>		
Cuspidine	Ca <sub>2</sub> (Si <sub>2</sub> O <sub>7</sub> )(F,OH) <sub>4</sub>		

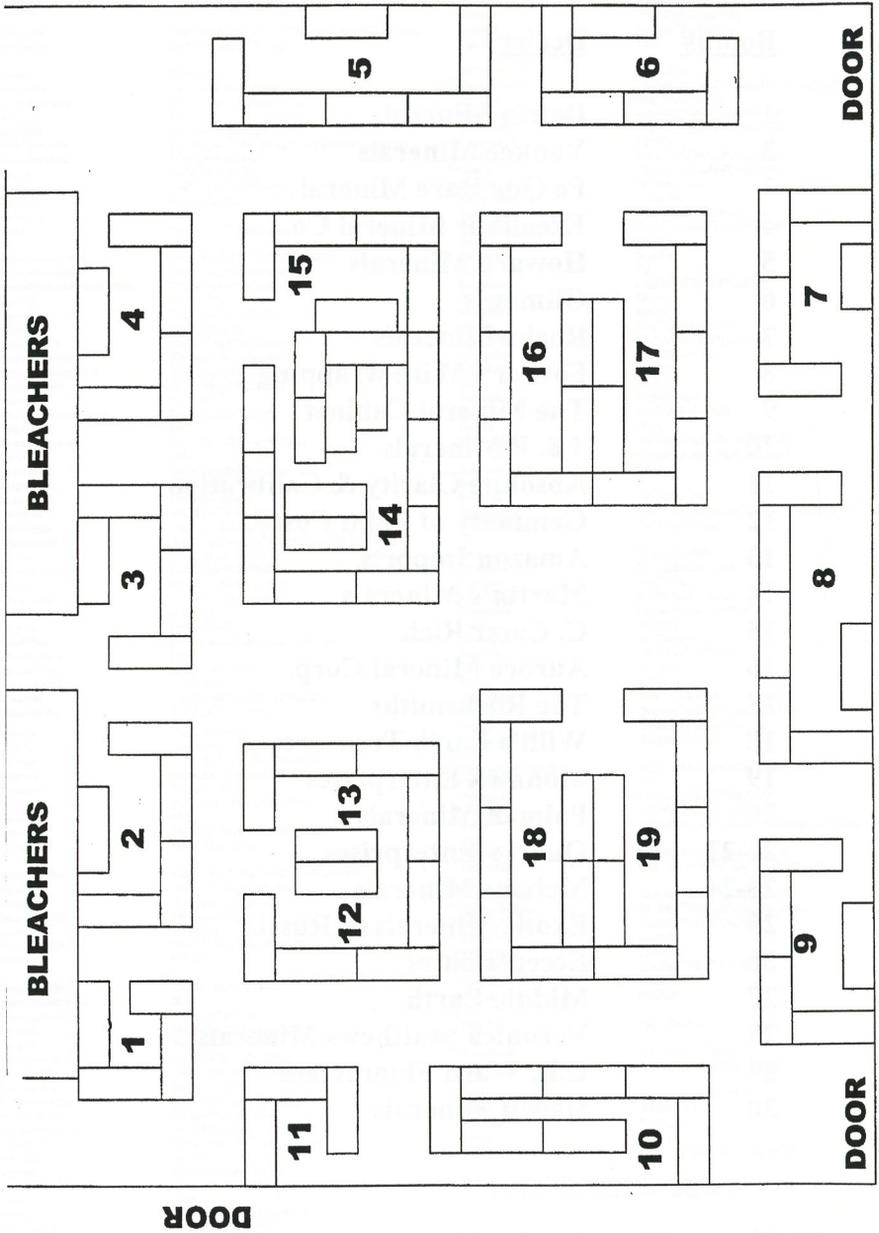
Jacobite	$(Mn^{2+}, Fe^{2+}, Mg)(Fe^{3+}, Mn^{3+})_2O_4$	Quartz	SiO <sub>2</sub>
<sup>13</sup> Jarosewitschite	$Mn^{2+}Mn^{3+}(AsO_4)(OH)_6$	Rammelsbergite	NiAs <sub>2</sub>
Jerrygibbsite	$Mn^{2+}(SiO_4)(OH)_2$	Realgar	As <sub>2</sub> S <sub>3</sub>
Johannsenite	CaMn <sup>2+</sup> Si <sub>2</sub> O <sub>6</sub>	<sup>27</sup> Retzián-(La)	$(Mn^{2+}, Mg)_2(La, Ce, Nd)(AsO_4)(OH)_4$
<sup>16</sup> Johannbaumeite	Ca <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub> (OH)	<sup>28</sup> Retzián-(Nd)	$Mn^{2+}(Nd, Ce, La)(AsO_4)(OH)_4$
Juniteite	Ca <sub>2</sub> ZnSi <sub>2</sub> O <sub>7</sub> H <sub>2</sub> O	Rhodochrosite	Mn <sup>2+</sup> CO <sub>3</sub>
Kaolinite	Al <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> (OH) <sub>4</sub>	Rhodonite	$(Mn^{2+}, Fe^{3+}, Mg, Ca)SiO_3$
Kentrolite	Pb <sub>3</sub> Mn <sup>2+</sup> Si <sub>2</sub> O <sub>6</sub>	Richterite	Na(CaNa)Mg <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>
<sup>15</sup> Kittianite	$Ca_3Mn^{2+}Mn^{3+}Si_2O_7(OH)_2 \cdot 8H_2O$	Roebingite	$Pb_2Ca_2Mn^{2+}(SiO_4)_2(SiO_3)_2(OH)_2 \cdot 4H_2O$
Koettigite	Zn <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·8H <sub>2</sub> O	Romeite	$(Ca, Fe^{2+}, Mn^{2+}, Na)_2(SiO_3)_2(O, OH, F)$
<sup>15</sup> Kolettite	$Mn^{2+}Zn_2(AsO_4)_2(SiO_4)(OH)_2$	Rosasite	$(Ca^{2+}, Zn)_2(CO_3)_2(OH)$
<sup>17</sup> Kraslitsite	$(Mn^{2+}, Mg)_2Zn_2Fe^{3+}(As^{3+}O_4)_2(As^{5+}O_4)_2(SiO_4)(OH)_4$	Roweite	Ca <sub>3</sub> Mn <sub>2</sub> <sup>2+</sup> B <sub>3</sub> O <sub>6</sub> (OH) <sub>6</sub>
Kumahorite	Ca(Mn <sup>2+</sup> , Mg, Fe <sup>2+</sup> )(CO <sub>3</sub> ) <sub>2</sub>	Rutile	TiO <sub>2</sub>
Larsenite	PbZnSiO <sub>4</sub>	Safflorite	(Co, Fe) <sub>2</sub> As <sub>2</sub>
Laumontite	Ca <sub>2</sub> (Al <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> ) <sub>2</sub> ·18H <sub>2</sub> O	<sup>29</sup> Samfowlerite	Ca <sub>24</sub> Mn <sub>2</sub> Zn <sub>2</sub> (Be, Zn) <sub>2</sub> Be <sub>2</sub> (SiO <sub>4</sub> ) <sub>12</sub> (Si <sub>2</sub> O <sub>7</sub> ) <sub>2</sub> (OH) <sub>12</sub>
<sup>18</sup> Lawsonbaumerite	$(Mn^{2+}, Mg)_2Zn_4(SO_4)_2(OH)_{22} \cdot 8H_2O$	Sarkinite	Mn <sub>2</sub> <sup>2+</sup> (AsO <sub>4</sub> )(OH)
Lead	Pb	Sauconite	Na <sub>2</sub> Zn <sub>2</sub> (Si <sub>2</sub> Al <sub>2</sub> ) <sub>2</sub> O <sub>10</sub> (OH) <sub>2</sub> ·4H <sub>2</sub> O
Legrandite	Zn <sub>2</sub> (AsO <sub>4</sub> )(OH)·H <sub>2</sub> O	Schallerite	$(Mn^{2+}, Fe^{3+})_{16}Si_8As_3^{3+}O_{36}(OH)_{17}$
<sup>19</sup> Leptoenaspite	$K_2(Mg, Mn^{2+}, Fe^{3+}, Zn)_4(Si, Al)_7(O, OH)_{21} \cdot 16H_2O$	Schoelite	CaWO <sub>4</sub>
Leucophoenicite	$Mn^{2+}(SiO_4)(OH)_2$	Schorl	NaFe <sup>3+</sup> Al <sub>3</sub> (BO <sub>3</sub> ) <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>4</sub>
Linacite	PbCu <sup>2+</sup> (SO <sub>4</sub> )(OH) <sub>2</sub>	<sup>30</sup> Sclearite	$(Zn, Mg, Mn^{2+})_2Zn_2(CO_3)_2(OH)_{10}$
Lironovite	Cu <sub>2</sub> <sup>+</sup> Al(AsO <sub>4</sub> )(OH) <sub>4</sub> ·4H <sub>2</sub> O	Scordodite	Fe <sup>3+</sup> AsO <sub>4</sub> ·2H <sub>2</sub> O
Lizardite	Mg <sub>3</sub> Si <sub>2</sub> O <sub>5</sub> (OH) <sub>4</sub>	Seligmannite	PbCuAs <sub>2</sub> S
Loellingite	FeAs <sub>2</sub>	Sepiolite	Mg <sub>6</sub> Si <sub>4</sub> O <sub>10</sub> (OH) <sub>2</sub> ·6H <sub>2</sub> O
Loseyite	$(Mn^{2+}, Zn)_2(CO_3)_2(OH)_6$	Serpierite	Ca(Cu <sup>2+</sup> , Zn) <sub>2</sub> (SO <sub>4</sub> ) <sub>2</sub> (OH) <sub>6</sub> ·3H <sub>2</sub> O
Magnesiobornblende	$\square Ca_2[Mg_4(Al, Fe^{3+})_2]Si_7AlO_{22}(OH)_2$	Siderite	Fe <sup>2+</sup> CO <sub>3</sub>
Magnesioriebeckite	$\square Ni_2[Mg_4(Fe^{3+}, Fe^{2+})_2]Si_7O_{22}(OH)_2$	Sillimanite	Al <sub>2</sub> SiO <sub>5</sub>
<sup>20</sup> Magnesium-chlorophoenicite	$\square Mg_2Fe^{2+}Zn_2(AsO_4)(OH)_6$	Silver	Ag
Magnetite	Fe <sub>3</sub> Fe <sup>2+</sup> O <sub>4</sub>	Sjögrenite	Mg <sub>2</sub> Fe <sup>3+</sup> (CO <sub>3</sub> )(OH) <sub>16</sub> ·4H <sub>2</sub> O
Magnussonite	Mn <sup>2+</sup> As <sup>3+</sup> O <sub>4</sub> (OH, Cl)	Skutterudite	CoAs <sub>3</sub>
Malachite	Cu <sub>2</sub> <sup>+</sup> (CO <sub>3</sub> )(OH) <sub>2</sub>	Smithsonite	ZnCO <sub>3</sub>
Manganaxinite	Ca <sub>2</sub> Mn <sup>2+</sup> Al <sub>2</sub> BSi <sub>4</sub> O <sub>15</sub> (OH)	Sonolite	Mn <sup>2+</sup> (SiO <sub>4</sub> )(OH, F) <sub>2</sub>
Manganberzelite	$(Ca, Na)_2(Mn^{2+}, Mg)_2(AsO_4)_2$	Spangolite	Cu <sub>6</sub> <sup>+</sup> Al(SiO <sub>4</sub> )(OH) <sub>2</sub> ·Cl·3H <sub>2</sub> O
Manganeose-hoernesite	$(Mn^{2+}, Mg)_2(AsO_4)_2 \cdot 8H_2O$	Spessartine	Mn <sup>2+</sup> Al <sub>2</sub> (SiO <sub>4</sub> ) <sub>2</sub>
Manganhumite	$(Mn^{2+}, Mg)_2(SiO_4)(OH)_2$	Sphalerite	(Zn, Fe)S
Manganite	Mn <sup>2+</sup> (OH)	Spinel	MgAl <sub>2</sub> O <sub>4</sub>
Manganocummingtonite	$\square Mn_2[Mg_2Si_2O_7](OH)_2$	Sturkeyite	MgSO <sub>4</sub> ·4H <sub>2</sub> O
Manganosite	Mn <sup>2+</sup> O	Sterlinghillite	Mn <sup>2+</sup> (AsO <sub>4</sub> ) <sub>2</sub> ·4H <sub>2</sub> O
Manganopyrosomalite	$(Mn^{2+}, Fe^{2+})_2Si_4O_{10}(OH, Cl)_6$	Stibnite	Sb <sub>2</sub> S <sub>3</sub>
Marcasite	FeS <sub>2</sub>	Stibnite-Na or -Ca	$(Na, Ca)_2K_2[Al_3Si_7O_{27}] \cdot 28H_2O$ $(Ca, Sr, Na, K)_2[Al_3Si_7O_{27}] \cdot 28H_2O$
Margarite	CaAl <sub>2</sub> □Al <sub>2</sub> Si <sub>2</sub> O <sub>10</sub> (OH) <sub>2</sub>	Strontianite	SrCO <sub>3</sub>
Margarosanite	Pb(Ca, Mn) <sup>2+</sup> Si <sub>2</sub> O <sub>6</sub>	Sulfur	S
Marialite	3NaAlSi <sub>3</sub> O <sub>9</sub> NaCl	Sussexite	Mn <sup>2+</sup> BO <sub>2</sub> (OH)
Marusturite	NaCaMn <sup>2+</sup> Si <sub>4</sub> O <sub>10</sub> (OH)	Synadelphite	$(Mn^{2+}, Mg, Ca, Pb)_2(As^{3+}O_4)(As^{5+}O_4)_2(OH)_2 \cdot 2H_2O$
Meallisterite	Mg <sub>2</sub> B <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub> ·9H <sub>2</sub> O	Synchysite-Ce	Ca(Ce, La)(CO <sub>3</sub> ) <sub>2</sub> F
<sup>21</sup> Megovernite	$(Mn^{2+}, Mg, Zn)_2(As^{3+}O_4)(As^{5+}O_4)_2(SiO_4)(OH)_{20}$	Talc	Mg <sub>3</sub> Si <sub>4</sub> O <sub>10</sub> (OH) <sub>2</sub>
Melnicite	3Ca(UO <sub>2</sub> ) <sub>2</sub> CaCO <sub>3</sub>	Tennantite	$(Cu, Ag, Fe, Zn)_{12}As_4S_{13}$
Meta-ankoleite	K(UO <sub>2</sub> ) <sub>2</sub> (PO <sub>4</sub> ) <sub>2</sub> ·6H <sub>2</sub> O	Tephroite	Mn <sup>2+</sup> SiO <sub>4</sub>
Metaloedevite	Zn(UO <sub>2</sub> ) <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·10H <sub>2</sub> O	Tetrahedrite	$(Cu, Fe, Ag, Zn)_{12}Sb_4S_{13}$
Metazuesmerite	Cu <sup>2+</sup> (UO <sub>2</sub> ) <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·8H <sub>2</sub> O	Thomsonite	Ca <sub>2</sub> Na[Al <sub>3</sub> Si <sub>6</sub> O <sub>26</sub> ]·6H <sub>2</sub> O
Microcline	KAlSi <sub>3</sub> O <sub>8</sub>	Thortite	(Th, U)SiO <sub>4</sub>
Mimetite	Pb <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> Cl	Thorveitite	(Sc, Y) <sub>2</sub> SiO <sub>7</sub>
<sup>22</sup> Minhillite	$(K, Na)_2Ca_2Zn_2Al_4Si_6O_{112}(OH)_{16}$	Thoronite	(Th, U, Ca)Ti <sub>2</sub> (OH) <sub>6</sub>
Molybdenite-2H	MoS <sub>2</sub>	Tilasite	CaMg <sub>2</sub> (Ti, O, OH) <sub>6</sub>
Monazite-(Ce)	(Ce, La, Nd, Th)PO <sub>4</sub>	Cartisite-Si	CaMg <sub>2</sub> (Si, O, OH) <sub>6</sub>
<sup>23</sup> Monzhydrocalcite	CaCO <sub>3</sub> ·H <sub>2</sub> O	Todorokite	$(Mn^{2+}, Ca, Mg)Mn^{4+}O_4 \cdot H_2O$
<sup>23</sup> Mosandrite	$(Mg, Zn, Mn^{2+})_2(SiO_4)_2(OH)_2 \cdot 8H_2O$	<sup>31</sup> Torreyite	$(Mg, Mn^{2+})_2Zn_2(SiO_4)_2 \cdot 8H_2O$
Muscovite-1M	KAl <sub>3</sub> □AlSi <sub>3</sub> O <sub>10</sub> (OH) <sub>2</sub>	Trmelonite	□Ca <sub>2</sub> Mg <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>
Nasonite	Pb <sub>2</sub> Ca <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> Cl <sub>2</sub>	Turneausite	Ca <sub>2</sub> (As, Pb) <sub>2</sub> O <sub>7</sub> Cl
Natroilite	$Na_6(Al_2Si_2O_7)_2 \cdot 2H_2O$	Unnamed amphibole	Ca <sub>2</sub> (Mg, Al)(Si, Al) <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>
<sup>24</sup> Németite	$(Mn^{2+}, Fe^{2+})_2Si_2As_2^{3+}O_{16}(OH)_{17}$	Uraninite	UO <sub>2</sub>
Neotocite	$(Mn^{2+}, Fe^{2+})_2Si_2O_7(H_2O)^\dagger$	Uranophane	Ca(UO <sub>2</sub> ) <sub>2</sub> [SiO <sub>3</sub> (OH)] <sub>2</sub> ·5H <sub>2</sub> O
Newberyite	MgHPO <sub>4</sub> ·3H <sub>2</sub> O	Uranospinitite	Ca(UO <sub>2</sub> ) <sub>2</sub> (AsO <sub>4</sub> ) <sub>2</sub> ·10H <sub>2</sub> O
Niabite	(NH <sub>4</sub> )(Mn <sup>2+</sup> , Mg, Ca)PO <sub>4</sub> ·H <sub>2</sub> O	Uvite	$(Ca, Na)(Mg, Fe^{2+})_2Al_3Mg(BO_3)_2Si_6O_{18}(OH, F)_4$
Nickelnie	NiAs	Vesuvianite	Ca <sub>10</sub> MgAl <sub>2</sub> (SiO <sub>4</sub> )(Si <sub>2</sub> O <sub>7</sub> ) <sub>2</sub> (OH) <sub>4</sub>
Nontronite	Na <sub>3</sub> Fe <sup>2+</sup> (Si, Al) <sub>2</sub> O <sub>10</sub> (OH) <sub>2</sub> ·nH <sub>2</sub> O	Villysellanite	$(Mn^{2+}, Ca, Zn)_2(AsO_4)(AsO_4)(OH)_2 \cdot 4H_2O$
Norbergite	Mg <sub>3</sub> (SiO <sub>4</sub> ) <sub>2</sub> (F, OH) <sub>2</sub>		
Ogdensburgite	Ca <sub>3</sub> (Zn, Mn <sup>2+</sup> , Fe <sup>2+</sup> )(AsO <sub>4</sub> )(OH) <sub>6</sub> ·6H <sub>2</sub> O		
Ojuelaitite	ZnFe <sup>2+</sup> (AsO <sub>4</sub> )(OH) <sub>2</sub> ·4H <sub>2</sub> O		
Oligoclase	(Na, Ca)Al(AlSi <sub>3</sub> ) <sub>2</sub> O <sub>8</sub>		
Orthochrysolite	NaCa <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH)	<sup>32a</sup> Walkildellite	Ca <sub>4</sub> Mn <sub>24</sub> <sup>2+</sup> As <sub>4</sub> <sup>3+</sup> O <sub>16</sub> (OH) <sub>16</sub> ·18H <sub>2</sub> O
Orthoclase	KAlSi <sub>3</sub> O <sub>8</sub>	<sup>32b</sup> Wayandaitite	Ca <sub>12</sub> Mn <sub>18</sub> <sup>2+</sup> B <sub>3</sub> Be <sub>1</sub> Si <sub>12</sub> O <sub>46</sub> (OH, Cl) <sub>30</sub>
Orthoserpierite	Ca(Si <sub>2</sub> ) <sub>2</sub> O <sub>7</sub>	Wendwilsonite	Ca <sub>2</sub> (Mg, Co)(AsO <sub>4</sub> ) <sub>2</sub> ·2H <sub>2</sub> O
Ovateite	Ca(Cu <sup>2+</sup> , Zn) <sub>2</sub> (SO <sub>4</sub> )(OH) <sub>2</sub> ·3H <sub>2</sub> O	Willemite	ZnSiO <sub>3</sub>
	CdCO <sub>3</sub>	Wollastonite	CaSiO <sub>3</sub>
		Woodruffite	(Zn, Mn <sup>2+</sup> )Mn <sup>4+</sup> O <sub>3</sub> ·1-2H <sub>2</sub> O
		Wulfenite	PbMoO <sub>4</sub>
<sup>25</sup> Parabrandite	Ca <sub>2</sub> Mn <sup>2+</sup> (AsO <sub>4</sub> ) <sub>2</sub> ·2H <sub>2</sub> O	Wurtzite	(Zn, Fe)S
Pararammelsbergite	NiAs <sub>2</sub>	Xenotilite	Ca <sub>6</sub> Si <sub>6</sub> O <sub>17</sub> (OH) <sub>2</sub>
Parapsynpsite	Fe <sup>2+</sup> (AsO <sub>4</sub> ) <sub>2</sub> ·8H <sub>2</sub> O		
Pargasite	NaCa <sub>2</sub> (Mg, Al)Si <sub>6</sub> Al <sub>2</sub> O <sub>22</sub> (OH) <sub>2</sub>		
Pectolite	NaCa <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH)		
<sup>26</sup> Pennantite-la	Mn <sup>2+</sup> Al(Si <sub>2</sub> Al)O <sub>10</sub> (OH) <sub>2</sub>	<sup>34</sup> Yentmanite	Mn <sub>9</sub> <sup>2+</sup> Zn <sub>6</sub> Sb <sup>3+</sup> Si <sub>4</sub> O <sub>28</sub>
<sup>26</sup> Petedunnite	Ca(Zn, Mn <sup>2+</sup> , Fe <sup>2+</sup> , Mg)Si <sub>2</sub> O <sub>6</sub>	Yukonite	Ca <sub>2</sub> Fe <sup>3+</sup> (AsO <sub>4</sub> )(OH) <sub>2</sub> ·12H <sub>2</sub> O(?)
Pharmacoilite	CaH <sub>2</sub> As <sub>2</sub> O <sub>7</sub> ·2H <sub>2</sub> O	Znalsite	Zn <sub>2</sub> Al <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub> ·2H <sub>2</sub> O
Pharmacosiderite	KFe <sup>3+</sup> (AsO <sub>4</sub> )(OH) <sub>6</sub> ·7H <sub>2</sub> O	Zincite	(Zn, Mn <sup>2+</sup> )O
Phlogopite-1M	KMg <sub>3</sub> AlSi <sub>3</sub> O <sub>10</sub> (OH) <sub>2</sub>	Zinkenite	Pb <sub>2</sub> Sb <sub>2</sub> Si <sub>2</sub>
Picropharmacolite	H <sub>2</sub> Ca <sub>2</sub> Mg(AsO <sub>4</sub> ) <sub>2</sub> ·11H <sub>2</sub> O	Zincosite	ZrSiO <sub>4</sub>
Piemontite	Ca <sub>2</sub> (Al, Mn <sup>2+</sup> , Fe <sup>2+</sup> )(SiO <sub>4</sub> )(OH)	Znucalite	CaZn <sub>11</sub> (UO <sub>2</sub> )(CO <sub>3</sub> ) <sub>2</sub> (OH) <sub>20</sub> ·4H <sub>2</sub> O
Powellite	CaMoO <sub>4</sub>		
Prenhite	Ca <sub>2</sub> Al <sub>2</sub> Si <sub>2</sub> O <sub>7</sub> (OH) <sub>2</sub>		
Pumpellyite-(Mg)	Ca <sub>2</sub> MgAl <sub>2</sub> (SiO <sub>4</sub> )(Si <sub>2</sub> O <sub>7</sub> )(OH) <sub>2</sub> ·H <sub>2</sub> O		
Pyrite	FeS <sub>2</sub>		
Pyroaurite	Mg <sub>6</sub> Fe <sup>2+</sup> (CO <sub>3</sub> )(OH) <sub>16</sub> ·4H <sub>2</sub> O		
Pyrobelonite	PbMn <sup>2+</sup> (VO <sub>4</sub> )(OH)		
Pyrochroite	Mn <sup>2+</sup> (OH) <sub>2</sub>		
Pyrophanite	Mn <sup>2+</sup> TiO <sub>3</sub>		
Pyroxenite	Mn <sup>2+</sup> SiO <sub>3</sub>		
Pyrrhotite	Fe <sub>1-x</sub> S		
		Minerals Unique to Franklin and Sterling Hill = 34	
		Total Mineral Species found at Franklin and Sterling Hill = 353	
		Changes to the list: glaucodot added (Nikkischer, A., P.T., '01) - Franklin Mine	
		cyanorichterite added (Dunn, P.J., 1985) - Sterling Mine	
		sterlinghillite off the unique list, found in Japan	
		pinelmitite is not a valid species; related to var. of talc	
		**minerals described by Dunn, P.J., 1995; not in Fleischer's Glossary	

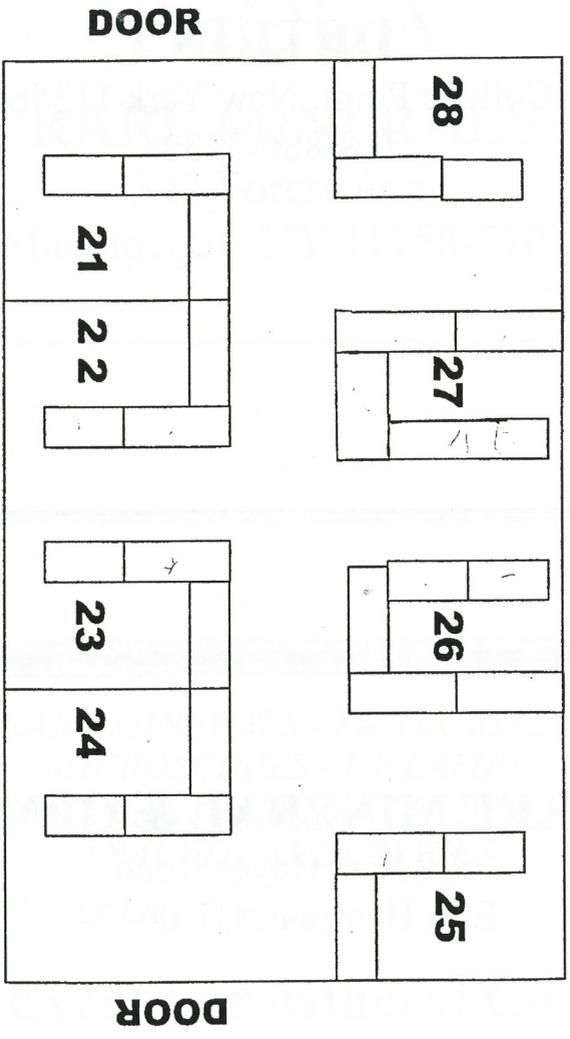
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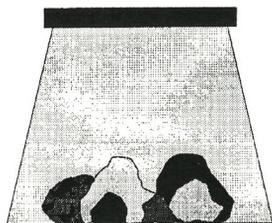
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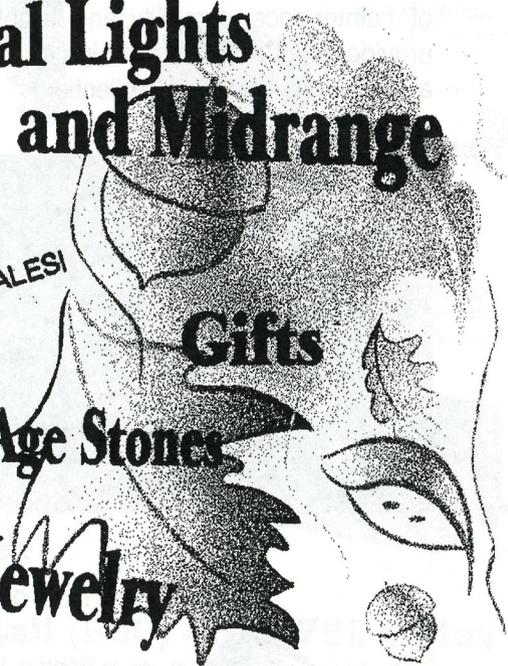
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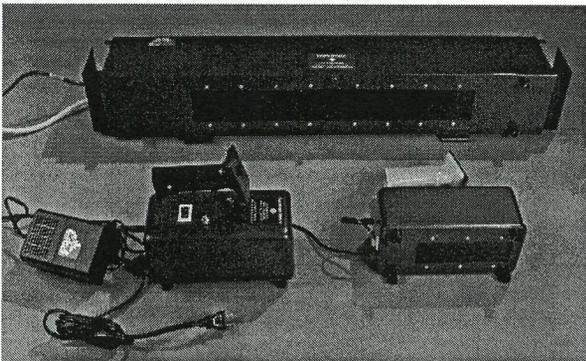
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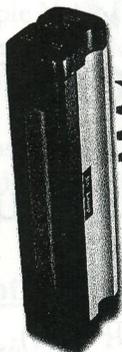
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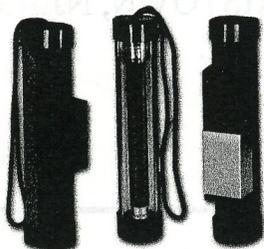


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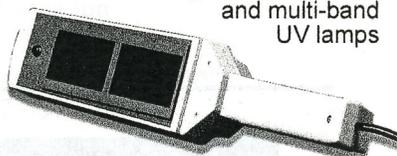
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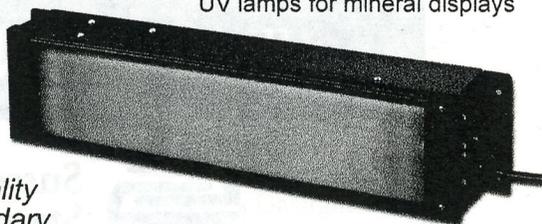


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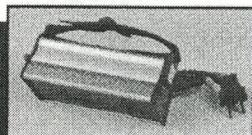
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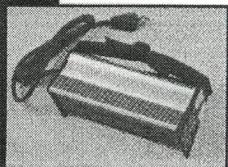
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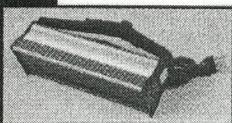
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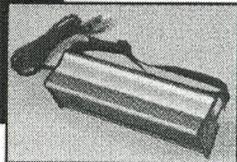
Model 4



Model 7



Model 8

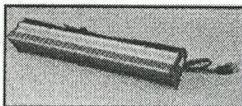


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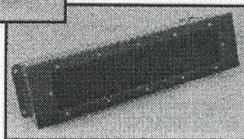
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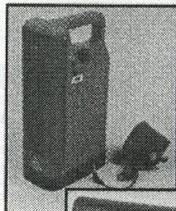


Model 18 and  
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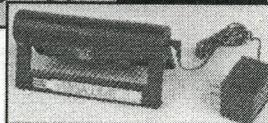


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*Franklin-Ogdensburg Mineralogical Society, Inc.*

BOX 146

FRANKLIN, NJ 07416

The Franklin-Ogdensburg Mineralogical Society, Inc., is an organization established to provide programs designed to benefit the community, the collector and those interested in the minerals, mineralogy and geology of the Franklin-Ogdensburg area of New Jersey.

Our purpose is:

1. To establish and maintain, in cooperation with other interested groups, a permanent Museum in Franklin, New Jersey, for the minerals of Franklin and Ogdensburg.
2. To develop new information on the minerals and mineralogy through cooperative programs with Universities and other scientific organizations and individuals.
3. To obtain and make available accurate up-to-date information on the minerals and mineralogy of the areas.
4. To facilitate collecting of the minerals while conserving material for future collectors.
5. To facilitate identification of the minerals.
6. To promote fellowship and the advancement of mineralogy and geology by providing meetings for the members of the Society.

If you are interested in these or related programs, you are invited to join with us. Our yearly activities consist of seven scheduled meetings and field trips, with special trips to Museums, Universities and other areas of special interest. Our publication "The Picking Table", which is issued twice yearly, in March and September, will advise you regarding the meeting and field trip dates and other activities of the Society.

**Dues are \$15 for individual memberships - \$20 for family memberships**

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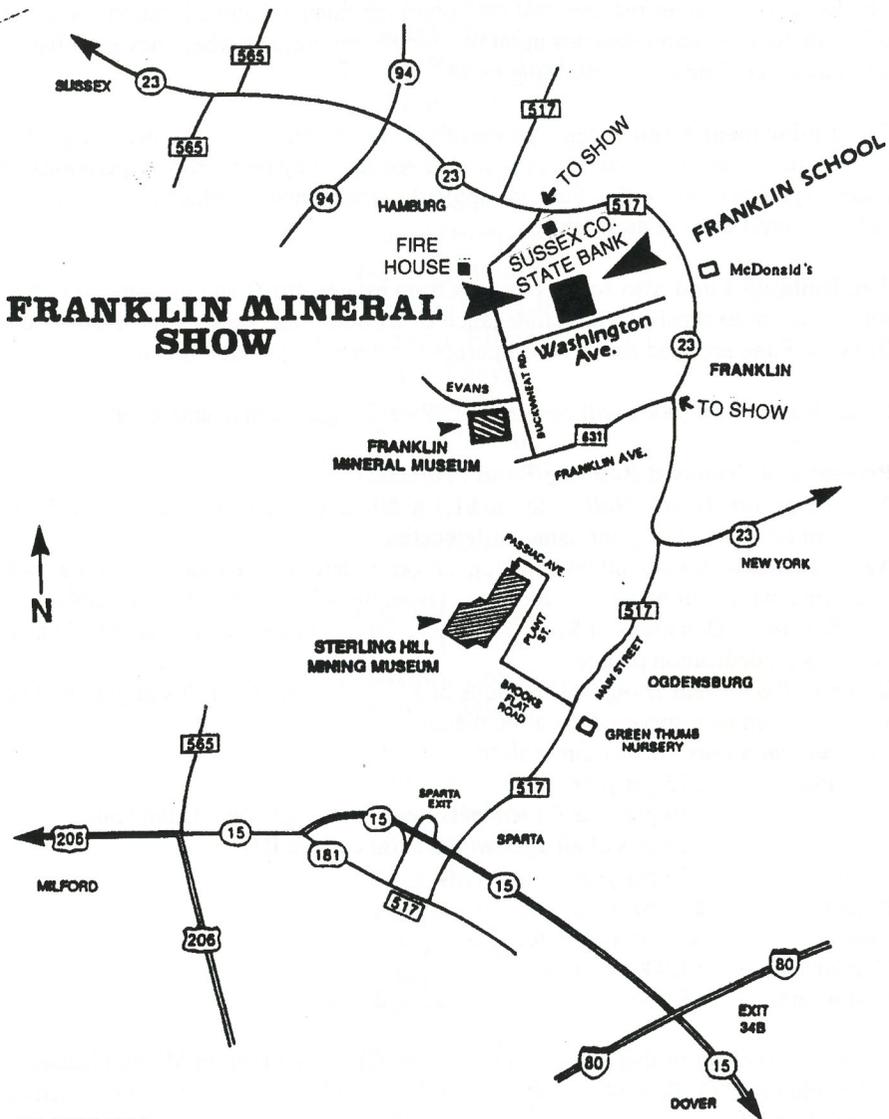
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## Franklin Mineral Museum's Endowment Fund and Building Fund

The Board of Trustees realized that the continued financial and educational success of the mineral museum depends upon two long-term projects when they established an Endowment Fund and a Building Fund.

**The Endowment Fund** accepts monies from estates, trusts and the general public. Income from the endowment fund is reinvested and may be used for operations, if necessary. Donations to this fund are applied to the principle, which are invested in secure interest earning accounts.

**The Building Fund** also accepts monies from estates, trusts and the general public for the use in expansion and maintenance of its buildings. Monies received by the Building Fund are used for its stated purpose and not for general operation.

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- Family** - \$25 per year
- Patron** - \$50 per year
- Life** - \$500 one time fee
- Corporate** - \$1,000 one time fee
- Sustaining** - \$5,000 in money, material, and/or services

Donations to either of these funds can be made out to the Franklin Mineral Museum and mailed to P.O. Box 54, Franklin, New Jersey 07416. Please indicate which of the funds the donations is for if you have a preference.

The trustees sincerely appreciate your support of the permanent preservation of the mineral history of the zinc mines of Franklin, New Jersey.

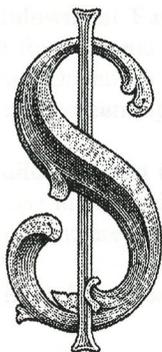
*All donations to the Endowment Fund and Building Fund are tax deductible.*

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## 2001 Booster List

**C.Richard Bieling  
Richard Bostwick  
Mark Boyer  
Robert Boymistruk  
John Baum  
Augusta Baum  
John Cianciulli  
Ron De Blois  
Carol Durham  
Daniel Durham  
Megan Durham  
George Elling  
Mike Faryna  
Pete Gillis  
Tema Hecht  
Larry Kennedy  
Joe Klitsch  
Steven Kuitems  
Joe Kaiser  
L & P Lapidary  
Lee Lowell  
Miriam Lowell  
Steven Misiur  
Claude Poli  
Andy Richter  
John Reiser  
Jim Rumrill  
Paul Shizume  
Earl Sullivan  
Ralph Thomas  
Bill Tross  
Earl Verbeek  
Maureen Verbeek  
Wilfred Welsh  
James Wynd  
Fred Young  
Sharon Young**

# Million Dollar how



**See a Million Dollar\$  
in Gem\$ & Mineral\$**

30th ANNUAL NJ EARTH SCIENCE ASSOCIATION  
GEM & MINERAL SHOW & Outdoor Swap & Sell

***Two show locations, directly  
across the road from each other:***

- ◆ **Robert E. Littell Community Center**  
(Formerly known as the Franklin Armory) and
- ◆ **Hardyston Township School**  
both near intersection of Routes 23 and 517  
in Franklin, NJ

**April 27, 2002, Sat. 9 AM - 5:30 PM**

**April 28, 2002, Sun. 10 AM - 5 PM**

Donation: \$4.00 per person - Children under 14 FREE with paying adult  
Donation covers both show locations

**Over 100  
Dealers in Gems,  
Minerals and Fossils**

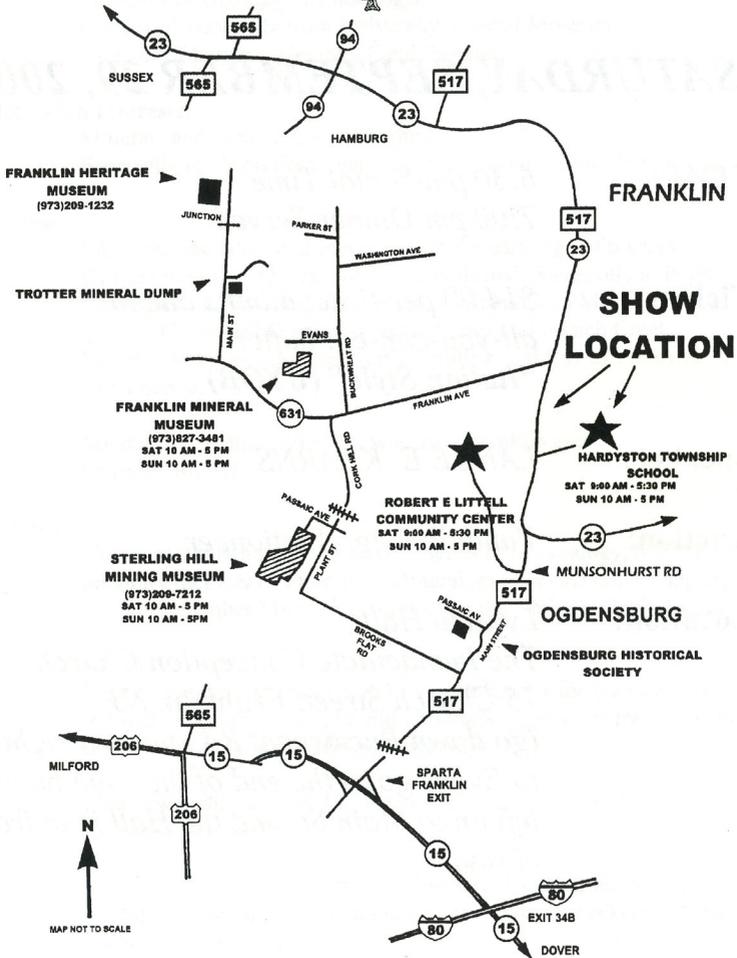
**This is an  
indoor & outdoor  
event**

**Free  
shuttle service  
is available**

A collaborative effort by the  
Franklin-Ogdensburg Mineralogical Society  
New Jersey Earth Science Association  
Sterling Hill Mining Museum  
all non-profit organizations

For information: Sterling Hill Mining Museum (973)209-7212

# Directions to Million Dollar Show



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# ***THE 24th ANNUAL F.O.M.S. BANQUET and AUCTION***

***SATURDAY, SEPTEMBER 29, 2001***

**TIME:**           6:30 pm Social Time  
                      7:00 pm Dinner Served

**Tickets:**       \$14.00 per ticket admits one to  
                      all-you-can-eat buffet  
                      *“Italian Style” (BYOB)*

**Speaker:**      *LANCE E. KEARNS*

**Auction:**       *Vandall King, Auctioneer*

**Location:**     *Lyceum Hall  
                      The Immaculate Conception Church  
                      75 Church Street, Franklin, NJ  
                      (go down Buckwheat Rd., make a right on  
                      to Evans go to the end of the road make a  
                      left on to Main St. and the Hall is in front  
                      of you)*

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## BIOGRAPHICAL SKETCH

### *Lance E. Kearns*

Born: 05/22/49 (Jeannette, Pennsylvania)

#### Education:

BS	Waynesburg College, Pennsylvania;	Geology (1971)
MS	Univ. of Delaware, Newark Delaware;	Coastal Processes (1973)
Ph.D.	Univ. of Delaware, Newark Delaware;	Mineralogy (1977)

**Dissertation:** Mineralogy of the Franklin Marble, Orange Co., New York

**Employment:** James Madison University 1977 to Present  
Professor of Geology - Mineralogist  
Curator of James Madison University Mineral Museum  
Director of Summer Geology Field Program

#### Present Research Interests:

Minerals and mineralogy of Virginia  
Especially the Morefield Pegmatite and Alumino-fluoride minerals

#### Personal Info:

I first became interested in minerals at the early age of 6 years. By the time I was 18 years old I had collected extensively at Pugh Quarry, Ohio; Franklin, New Jersey; Cornwall Iron Mines, Cornog Quarry, Cedar Hill Quarry, Wheatly Mines and French Creek, Pennsylvania; Spruce Pine, North Carolina, and Bay of Fundy Area, Nova Scotia.

My major personal collection was from Franklin and Sterling Hill, NJ

#### Memberships:

American Mineralogical Society; Friends of Mineralogy, S.E. Chapter; honorary member of Friends of Mineralogy, Pennsylvania Chapter; honorary member Micromineralogists fo the National Capitol Area.

#### Family:

I am married to Cynthia (Cindy) Evaniak Kearns for the past 10 years. She is a metamorphic petrologist and Laboratory Specialist for the Geology Department at James Madison University.

I have two children; Janel L. Kearns (22 years old) and Jessica C. Kearns (23 years old).

Cindy and I have two Australian Shepherd dogs that we show occasionally, we enjoy traveling and spend most of our summer weekends at the lake water skiing and boating.

**STERLING HILL MINING MUSEUM**  
 30 PLANT STREET  
 OGDENSBURG, NJ 07439-1126



Welcome to  
**The Sterling Hill Mine**  
 in Ogdensburg, NJ

**UNDERGROUND MINE TOURS**

**PASSAIC & NOBLE PIT  
 COLLECTING OPEN TO THE PUBLIC**

During the Franklin-Sterling Hill Mineral Show, Sept. 30, 2001

**Open Sunday, 10 AM to 3 PM**

Admission: \$10.00 per person, \$1 per pound after first 10 pounds

**STERLING HILL GARAGE SALE**

September 29 and 30,  
 Saturday and Sunday, from 1 PM to 3 PM



**MINE TOUR ADMISSION**

ADULT	9.00
CHILDREN (UNDER 17)	6.00
SENIOR CITIZEN (65+)	8.00

**HOURS**

OPEN 7 DAYS A WEEK  
 HOURS 10 AM TO 3 PM  
**TOURS AT 1 PM WEEKDAYS  
 11 AM & 1 PM WEEKENDS  
 & OTHER TIMES BY CHANCE  
 OR APPOINTMENT  
 FROM APRIL 1 TO NOV. 30**

MARCH AND DEC., WEEKENDS ONLY  
 OTHER TIMES BY APPOINTMENT

**JULY & AUGUST TOURS  
 7 DAYS A WEEK  
 11 AM & 1 PM**

**GROUP RATES AVAILABLE**

**For information call  
 (973)209-7212  
 FAX 973-209-8505  
 www.sterlinghill.org**

**COLLECTING AVAILABLE**

Last Sunday of each month, April to Nov. 10 AM to 3 PM

## FRANKLIN MINERAL MUSEUM MEMBERSHIP

32 Evans Street Franklin, NJ 07416

Museum 973-827-3481 Curator 973-827-6671

Fax 973-827-0149 e-mail [funrocks@warwick.net](mailto:funrocks@warwick.net) Web: [www.franklinmineralmuseum.com](http://www.franklinmineralmuseum.com)

The Museum is a private, non-profit organization created for the educational and scientific purposes in mineralogy, geology, archeology, and paleontology. The Museum's primary emphasis is the history and mineralogy of the Franklin-Sterling Mineral district. We would like to welcome all our members new and old and express our appreciation for your continued support.

### All Memberships include the following:

- Museum Identification card
- 10% discount in the museum shop, excludes consignment materials or
- materials used for educational purposes
- Member may consign mineral related items in the museum shop at the discretion of the manager or curator.
- Museum Newsletter
- Invitations to planned Museum functions and auctions (patron, life and sustaining members)
- A special week of Holiday shopping discounts throughout our gift shop
- Discount on members children's birthday parties

### MEMBERSHIP CATEGORIES: (please circle one)

1. **STUDENT** : \$10.00 per year (requires valid ID)  
Benefits also include 3 free admissions to either the Museum or Collecting Dump\*
2. **INDIVIDUAL** : \$15.00 per year (FOMS members 10.00)  
Benefits also include: 4 free admissions to either the Museum or Collecting Dump\*
3. **FAMILY** : \$25.00 per year or **FAMILY PLUS**: \$40.00  
Family benefits Include: 6 free admissions to either the Museum or Collecting Dump\*  
Family plus includes: 6 free admissions plus 4 guest passes
4. **PATRON** : \$50.00 per year  
Benefits also Include:
  - a) 12 free admissions to either the Museum or Collecting Dump\*
  - b) Invitations to planned functions and auctions.
5. **LIFE** : \$500.00 one-time fee  
Benefits also Include:
  - a) Unlimited Museum Exhibit Visits
  - b) 10 Collecting Dump\* admissions, per year.
  - c) 15 Guest passes for either the Museum Exhibits or Collecting Dump per year.
  - d) Invitations to planned functions and auctions.
  - e) Name engraved on Museum Membership Plaque.
6. **SUSTAINING**: \$5000.00 one time fee, American Currency, Material, and/or Services  
Benefits also Include: All entitlements of Life membership, plus recognition as deemed appropriate by the Museum Board of Trustees.

\*Collecting includes up to 6 pounds of rock/mineral material.

-----Detach here and Mail-----

Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Address: \_\_\_\_\_

Membership Type: \_\_\_\_\_ Membership fee: \$ \_\_\_\_\_

Amount Enclosed: \$ \_\_\_\_\_ Checks payable to: Franklin Mineral Museum

Please charge my \_\_\_\_\_ Visa \_\_\_\_\_ MC Account # \_\_\_\_\_ Exp. date \_\_\_\_\_

\_\_\_\_\_  
Signature (required for credit card payments)

Send Membership Application and payment to:  
Franklin Mineral Museum, Memberships, P.O. Box 54, Franklin, NJ 07416

Membership card(s) will be mailed or issued to you upon receipt of application.

.....All memberships expire on March 31<sup>st</sup>.....

Museum Use Only: Card Type Issued \_\_\_\_\_ Date \_\_\_\_\_ By \_\_\_\_\_

# Franklin Mineral Museum

"Located in the Fluorescent Mineral Capitol of the World"

32 Evans Street

Franklin, Sussex County, New Jersey

The Museum features RARE and UNUSUAL MINERALS, world famous FLUORESCENT MINERALS, FOSSILS, ARTIFACTS, a MINE REPLICA, and hands-on ROCK COLLECTING on a 3.5 acre mine tailing dump.

← Picnic area & Gift Shop. →

## OPERATING SCHEDULE

March: Open weekends and by appointment

OPEN SEVEN DAYS

APRIL - NOVEMBER

M - S 10 to 4 Sun 11 to 4:30

Nominal Admission Fees

Senior discounts, Group Rates

Book Early!

Tours and Collecting daily

## SPECIAL EVENTS

May Appreciation Day

June Night Dig

September Gem Show

November Night Dig

check web page for dates

[FranklinMineralMuseum.com](http://FranklinMineralMuseum.com)