



U.V. Waves

Vol. XXVI No. 1 January/February 1996 *Newsletter of the*

Fluorescent Mineral Society, Inc.

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President's Message: Tucson, Henkel Glossary Reprint



Happy New Year to everyone and good health to all. Your Board of Directors is looking forward to a banner year for the FMS in 1996.

Our membership has been stable and we expect an upsurge in new members following our 25th anniversary at the 1996 Tucson Gem & Mineral Show. We hope to meet with as many of you as possible in Tucson this February.

We will have the updated "Second Printing" of the Henkel Glossary of Fluorescent Minerals available for sale at the Tucson Show. The initial run of 1250 copies printed in 1989 is gone. Sometime in the future, we will publish a second edition as the editors feel there will be sufficient new information to warrant it. I will try to bring a few "Complete Sets" of Dr. Gerhard Henkel's "Master Copy Files" that contain further information including localities, mines, etc., over and above what is contained in the "Henkel Glossary".

by Dr. Rodney K. Burroughs, #471, California

These will be photocopies of his master files. If interested, you can check with me in Tucson.

We will also have available for sale FMS patches, pins, decals, FMS Journals, etc. I believe these will be available at the FMS booth on the ground floor of the Convention Center near where you purchase your tickets to enter the show. There will also be a "bulletin board" at the FMS booth where members and guests can post messages to others and leave information as to where they are staying, telephone numbers, meetings, dinners, etc.

The fluorescent grab bags are **sold out**. Any orders received with checks will be returned to the sender. Your support has been most appreciated, and we hope you have been satisfied with your purchases. Thank you again.

See you at Tucson!

Big Differences in UV Tubes

by Doug Mitchell, #578, California



I had heard before that different UV lights make for different

fluorescences. But I never realized that choosing a different longwave UV tube could make the difference between yellow and red, or the difference between bright fluorescence and no fluorescence.

While differences in glass, reflectors, and filters can make a significant change in results, the difference that has been surprising many of us lately comes from the differences in the phosphors used in longwave UV tubes. Longwave UV is most commonly produced by using a low-pressure mercury vapor lamp to produce shortwave UV, and coating the inside of the tube with a phosphor that fluoresces by emitting longwave UV rays. There is much visible light produced also, so filtering is needed. When filtering is built into the glass of the tube, it appears dark purple and is called a "BLB" (Black Light Blue) tube. When no filter is built in, the tube appears white, and is called a "BL" tube.

The longwave UV phosphors used in these tubes evidently fall into two major categories: those producing UV peaking at 350 nanometers (nm) in wavelength, and those with a peak near 370 nm. This appears to be the difference that produces the greatest color variations in fluorescent minerals. While most minerals that fluoresce under longwave UV appear similar under both types of UV light, the differences can be dramatic in some cases.

Those agrellite specimens we have tried will fluoresce their unusual magenta-pink color under the 350 nm lamps, but appear to not fluoresce at all under 370 nm lamps. "Terlingua-type" calcites are often also affected some Mexican optical calcites that fluoresce

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Big Differences in UV Tubes, continued

blue violet under shortwave UV (and phosphoresce afterwards) are yellow-white under 350 nm and orangeish-pink under 370 nm, while others are pink under 350 nm and orange-pink under 370 nm. Agates and chalcedonies that fluoresce yellowish-green under 350 nm may fluoresce greenish-white under 370 nm.

Since the two different types of longwave are not clearly identified as such, there are possibilities for confusion if a dealer shows a specimen under a lamp of

one type and the buyer takes it home to lamps of the other type. Let the agrellite buyer beware!

There is no such problem for shortwave UV tubes - since there is no phosphor involved, just the direct emissions from low-pressure mercury vapor, the peak is consistently a narrow one at 254 nm.

But the newly popular midwave UV tubes have this problem of phosphor variations to a still larger extent, as noted in Don Newsome's article "Standards for UV Lamps" in this issue.

Trading Post

Trade notices are published in good faith, but the FMS cannot assume responsibility for the actions of traders.

Opal var. Hyalite SW G, Chalk Mt. NC, or **Barite** SW weak Cr, PH, Cartersville, GA, for FL.
Robert Madden
43 Wellington Way
Rome, GA 30161 (USA)

2 & 3 FL combinations, Fkn, NJ, write for list, include list of your material, any FL.
Ed Letscher
4532 Meadow Dr.
Nazareth, PA 18024-8528 (USA)
Phone (610) 759-4293

Write directly to the trader and arrange complete details of the exchange before sending any material. For abbreviations and procedures for this column, see the U.V. Waves of Nov./Dec. 1995.

Questions and Answers

Q: How soon can we hope meionite ("wernerite") from Canada will be readily available again?

A: Canadian meionite ("wernerite") is available from a new source, given as Ladysmith, near Otter Lake, Quebec. Ladysmith is about 45 miles NW of Ottawa. This material was present in abundance at the 1995 Franklin show, in specimens of all sizes; one I saw weighed about 115 lbs. The supplier, who I understand went back in for more just before the prospect got snowed in, is Darryl McFarlane of Grenville Minerals, P.O. Box 453, Kingston, Ontario K7L 4W5, Canada. I think he prefers to wholesale the material in quantity, although

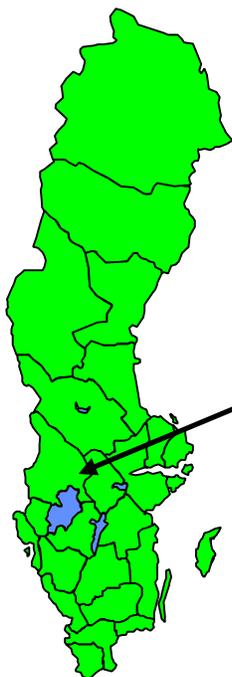
at the Franklin show he had a table set up for wholesale and retail sales. How widely available his "wernerite" is may depend on where he's been circulating. NY-NJ area dealers, for example, had it after getting it from him at the Franklin show. At that time Grenville Minerals also had many fine specimens of the rare fluorescent mineral agrellite from the Kipawa River, Temiscaming Co., Quebec, Canada.

by Richard Bostwick, New Jersey

Do you have a question about fluorescent minerals? Do you have an answer (or an expansion or correction of a given answer) for one of the questions asked before? Please send it to Doug Mitchell, 4342 Green Ave. #15, Los Alamitos, CA 90720 USA, or E-mail to 70621.702@compuserve.com

Fluorescent Minerals of Langban, Sweden

by Richard Loyens, #459, Belgium



My attention was attracted by information about Langban, Sweden, which included superlatives like "The world's most mineral-rich area." It made me curious so I left home for fourteen days to visit that area in Sweden.

Langban is situated in the province of Varmland, about 20 km from Filipstad, and it has a long mining history.

During the Black Death, about 1350, iron ores with lenses of sulfide ores were discovered. It is known that three men ran the melting house as early as the middle of the 16th century.

In 1711, mining operations started, at the location which was called the stor mine (large mine). The remnant is now nothing but an opening. In 1725, the Kollegii (collegium) mine was started, and was operated until 1870 when it was closed due to impractical access to the ore. Later on, we have the nya (new) shaft in 1877, the Bjelkes shaft in 1882, and the Loka shaft in 1905.

The best years were between 1880-1930, when 75 workers were employed, 23 underground, 17 above ground, 16 in the machine shops, and 20 in the concentration mill. From the beginning through 1929, over 540,000 tons of iron ore and 160,000 tons of manganese ore were mined. The mines were worked to a depth of 750 feet.

The geology of Langban is very complex. The rocks belong to four periods. In order of decreasing age, these are: (1) the super crystals, (2) the older Archean granites and greenstones, (3) the younger Archean granites and greenstones, and (4) diabase dikes. The Langban area includes several Langban-type orebodies. You can find them at the villages of Langban, Harstigen, Pajsberg, Nordmarks Odalfält, Jakobsberg, and the Sjö mine. The melting house of Langban was closed down in 1930 and the mining stopped in 1972.

Today, the area of Langban is in very good condition, a very well preserved mining village. You can visit the mining buildings, the shaft, the workhouse, and the dumps. Since June 1994, you can also visit the mineral museum and an exhibition of minerals from the famous brothers John and Nils Ericsson, born in Langban in the beginning of the 19th

century. There is also a very small cabinet of fluorescent minerals.

Collecting minerals requires an adaptation by the rock hunter. Due to the midnight sun, it will not be dark enough to see fluorescence well. But, with your U.V. lamp, it is possible to find fluorescent minerals notwithstanding the always-present small amount of light during the summer nights.

You will find good information about Langban in the magazine "*The Mineralogical Record*", Volume 1, Winter 1971, page 154-172, which contains a large article about "The Mineralogy and Chemistry of Langban-type Deposits in Bergslagen, Sweden", by Paul B. Moore.

According to the article mentioned above, much has been said about the kinship between the Langban and Franklin, New Jersey deposits. There seems to be little support for a common heritage, since the differences are the biggest where we would expect them to be the least. Similarity in the mineralogy at the final stage of metamorphism between deposits does not indicate a common origin of the proto-ore. It merely means that similar reaction temperatures and compositions were encountered during metamorphism. However, even here the differences between the two deposits are too big to be ignored. At Langban-type deposits, the iron and manganese ores are differentiated. At Franklin, they occur together (along with zinc) in the spinel franklinite. The Franklin deposits have so far not revealed any equivalent of the leptites. Even the lead silicates at Franklin have a texture and paragenesis which are distinct from the lead silicates of Langban.

The colors of the fluorescent minerals of Langban are generally similar to those of Franklin. At Langban we can find approximately 190 different minerals of which a certain percentage is fluorescent.

In the article of *The Mineralogical Record* we read: "It is a long-standing policy in Sweden to discourage private collectors of irreplaceable natural objects such as minerals." To this day, collectors visiting Sweden will be struck by the reluctance of mine and quarry owners to offer permission to collect minerals except for research purposes. That may be a reason why we do not find much information about the fluorescent minerals from Langban. It seems the greatest interest in fluorescence of minerals from this area is found outside Sweden. Serious collectors would find a collecting trip to Sweden rewarding if they follow the proper procedures for obtaining advance permission.

(continued on next page)

Fluorescent Minerals of Langban, Sweden, *continued*

A lot of research is being done about the minerals of Langban. The Mineralogical Section of the Swedish

Natural History Museum has the largest collection of Langban minerals, with over 30,000 specimens.

About 190 minerals are found at Langban. Based on the "Henkel Glossary", 65 different minerals may be able to fluoresce.

<u>Chalcogenides:</u>	aragonite	caryinite	bustamite	phlogopite
sphalerite	barytocalcite	apatite	celsian	plagioclase
	benstonite	hedyphane	chabazite	prehnite
<u>Oxides and</u>	cerussite	mimetite	chondrodite	rhodonite
<u>Halides:</u>	dolomite	svabite	diopside	scapolite
brucite	norsethite	stolzite	forsterite	serpentine
fluorite		tilasite	ganomalite	sillimanite
hausmannite	<u>Sulfates:</u>		harmotome	talc
periclase	anhydrite	<u>Silicates:</u>	hyalophane	thomsonite
quartz	barite	aminoffite	hyalotekite	tremolite
spinel	gypsum	andalusite	margarosanite	trimerite
swedenborgite	lanarkite	apophyllite	microcline	vesuvianite
wickmanite		banalsite	nasonite	
	<u>Arsenates,</u>	barylite	natrolite	
<u>Carbonates:</u>	<u>Phosphates:</u>	barysilite	pectolite	
calcite	berzeliite	biotite	clinocllore	

In a personal communication, the late Dr. G. Henkel indicated the following 14 different minerals are fluorescent in specimens from Langban:

banalsite	SW	red
benstonite	SW	red
calcite	SW	red
caryinite	SW	red
celsian	SW	blue
dolomite	SW	red
fluorite	LW	blue-violet
hedyphane	SW	orange
hyalophane	SW	blue
margarosanite	SW	yellow-white
rhodonite	SW	red
svabite	SW	orange
swedenborgite	SW	blue
tilasite	SW	orange

Visiting Langban in 1994, I only found 2 fluorescent minerals on the dump: calcite and svabite. In my own collection, I have 9 different minerals from the Langban-type ore deposits that are fluorescent, as follows:

barytocalcite	SW	blue-white
benstonite	SW	red
calcite	LW	red
	SW	orange-red
chondrodite	SW	orange
johnbaumite	SW	pink-orange
margarosanite	SW	yellow-white
powellite	SW	yellow
scheelite	SW	blue
svabite	SW	orange

There is still a great deal that might be learned about fluorescence of minerals from Langban, Sweden.

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Standards for UV Lamps



The first thing we need to do is establish a standard terminology.

What exactly are we referring too when we talk about MW (called mid-wave, middlewave, midrange UV)? I believe when fluorescent mineral collectors are using the term MW they mean any lamp (or source) that produces energy between longwave (LW) and shortwave (SW) UV. We might call it UV-B, that is what engineers and physicists call it, or maybe just MW. I will use the engineering terms for lamp and light. "Lamp" means the source, sometimes called a "tube" or "bulb". "A light" means a light assembly or light fixture, including housing, circuitry, and lamp, and in the case of most UV lights, a filter.

Now we know that almost all shortwave UV lamps radiate at 253.7 nm (sometimes rounded off to 254 nm). However, with longwave UV we have a minimum of three different sources for fluorescent mineral collectors, two of which have been known for a long time.

(1) The first is the monochromatic source from a high pressure mercury (Hg) lamp used with a longwave UV filter. That lamp is usually a flood light shape (technically a PAR-38 bulb) and is usually 100 Watts, although some are available at 75W, 175W, and 250W and above. The high pressure Hg lamps produce longwave UV energy only in a monochromatic band at 365 nm, and cause certain calcites from Muzquiz, Coahuila, Mexico to fluoresce pink, just like the well-known Terlingua, TX calcites.

(2) The second and third sources are tubular fluorescent lamps that have a longwave UV or "black light" phosphor. The problem is that there are at least two (maybe more) standard types of phosphors that are being used by the lamp manufacturers for "black light" lamps.

(2 A). One phosphor has been used for a while and peaks at about 368 nm and (when used in an ultraviolet light with an external longwave UV filter) causes the same Muzquiz calcites to fluoresce pink.

(2 B) The other is a newer phosphor that peaks at about 350 nm and causes most of the same Mexican calcites to fluoresce "salmon" color (not pink).

Almost all of the UV light manufacturers of smaller hand held UV lights use either one or two 4 Watt or 6 Watt lamps. Most (but not all) lamp manufacturers of the 4W and 6W "black light" lamps today use the 350 nm phosphor. However, without some special equipment it is difficult to determine which type of phosphor a lamp uses. To complicate

by Don Newsome, #14, Washington

things more the peak alone is not an exact method of determining what the effect will be on fluorescent minerals (as I will explain later).

Now MW is a more complicated issue. I have information from a lamp manufacturing company that specializes in suntanning fluorescent lamps, that there are at least 17 to 20 different phosphors that would be between shortwave and longwave UV. And to make it more complicated several customers have different combinations of phosphors mixed in one lamp! The result is there is at least 30 different lamps that could be called MW or UV-B! The majority of them may give different results with the same fluorescent minerals. I have some Mexican calcite that fluoresces four different colors, one under SW, another under LW 2A, another under LW 2B, and another under my MW lamps. Also most glass envelopes (tubing) used in fluorescent lamps (including "black light" lamps) are inexpensive soda lime glass and will not transmit much below 290 nm. Some suntanning lamps therefore use a special "erythema" glass (that costs ten times as much) that will transmit all of the UV-B wavelengths for that phosphor.

Even if two different MW lamps had the same peak, say 312 nm, that does not mean that a specific fluorescent mineral will look the same under each lamp. The spectral distribution (the energy at specific wavelengths) of the UV is the main factor. One lamp may have most of its energy at higher wavelengths with an asymmetrical distribution above 312 nm. The second lamp may have a symmetrical distribution around 312 nm, or asymmetrical below 312 nm. Therefore the spectral distribution of a lamp is the important factor for determining the results that a fluorescent mineral collector should expect.

The point of all this is I believe that the FMS should take on a technical program to define and standardize MW or UV-B lamps. We would have to work with all 5 of the companies that make ultraviolet lamps for hobbyists to come up with some standards. The result would be that any company that makes ultraviolet lights for fluorescent mineral collectors would use a MW lamp that is defined so that all collectors would get the same result when viewing the same specimens. I imagine that there may be two or three "standard" lamps that could be defined, but as long as the fluorescent mineral collector knows what lamp he has, his observations can be reproduced by someone else. Today they cannot be duplicated unless everyone buys that same exact model of lamp from the same company.

News from Europe

by Richard Loyens - #459, Belgium (FMS Regional Vice President of Europe)



The European Division of the FMS, especially the members from Belgium, got the opportunity to participate in a mineral show in France. The show's location was about 100 km to the north of Paris, at St. Just en Chaussée near Compiègne. The show took place during the celebration of the 250th birthday of Valentin Haüy. I believe Valentin is the younger brother of René-Just Haüy, the crystallographer, which is the reason we had that opportunity to do this show. We did a presentation of fluorescent minerals, while the celebrated museum of "L'école Requiem Des Mines De Paris" (Mining School of Paris) presented a very nice world wide mineral show and a cabinet especially for René-Just Haüy. The FMS, European Division, had

one show cabinet with both longwave and shortwave UV. The exhibit included these minerals: diamond from Zaire, autunite from France, calcite from Rio de Sul in Brazil, aragonite from Italy, and shortwave-fluorescent minerals from Franklin, New Jersey, and Langban, Sweden. With the cooperation of Gerard Barmarin, Erik Saeys and Piet Van Hool, this show was a success.

At the mineral show of Nov. 12, 1995 at Berchem, Antwerp, we enjoyed the presence of George Adleman (FMS #797) from Massachusetts. He was in Europe and particularly in Belgium. We organized a short FMS meeting with the members who could be present.

Traveling to Amsterdam in the Netherlands, we visited Nick Padalino (FMS #805) at the "Fluorescent Lady", a fluorescent museum of modern art. A very special way to show fluorescence.

Fluorescence in South Dakotan Pegmatite

by Joe Pollard, #145, B.C., Canada



Last spring I had occasion to visit South Dakota and see the unfinished Crazy Horse Sculpture. In so doing, I acquired a piece of rock from the sculpture and brought it home.

On arriving home, I lamped the specimen and found some areas of it fluoresced light blue under shortwave UV, with no fluorescence under longwave UV. I then used a drop of hydrochloric acid to determine if it was calcite and no effervescence occurred. There was feldspar in the rock's make-up, but I doubt very much if it would fluoresce blue, as it is usually a raspberry red. I have ruled out fluorite, as the specimen does not respond to longwave UV. There may have been oil used in the vicinity for drills, vehicles, etc., but I can see no signs of staining. Is it possibly scheelite? It does not seem bright enough blue-white for that. Also I observed no phosphorescence.

I was wondering if anyone has a similar specimen and knows what the fluorescent mineral might be.

A card accompanied the rock with the following minerals listed with their colors:

Pegmatite Granite - Color Code	
Black	Tourmaline
Rust	Iron (oxidized)
Red	Garnet
Chalky pink or white	Feldspar
Crystalline pink (white or gray)	Quartz
Sparkling clear	Mica (Muscovite)
Greenish-yellow	Beryl
Pale brass yellow with metallic luster	Pyrite

[Editor's note: In *Fluorescence: Gems and Minerals Under Ultraviolet Light*, Manuel Robbins describes several instances of feldspar minerals (from albite to microcline) fluorescing blue-white. In particular, he describes a "glassy tan microcline perthite" in a pegmatite from Custer, South Dakota that shows this fluorescence "in patchy areas with a parallel alignment." Joe, does your label indicate the source of the pegmatite?]

Fluorescent Minerals in the Magazines

The current issues of *Mineralogical Record*, *Rocks & Minerals*, and *Rock & Gem* magazines all feature fluorescent minerals under UV on the cover and have numerous articles on our favorite subject.

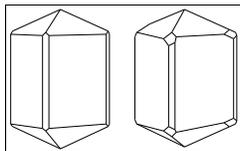
Mineralogical Record has "Luminescence in Minerals" by J. Rakovan and G. Waychunas, "FM-MSA-TGMS-FMS Tucson Mineralogical Symposium: Fluorescence and Luminescence in Minerals" by P. Modreski (about the symposium on Feb. 11 in the Copper Ballroom; abstracts are included).

Rocks & Minerals has "Fluorescent Minerals, a Review" by P. Modreski and R. Aumente-Modreski, "Fluorescent Minerals of Sterling Hill: 1989-1995" by R. Bostwick, and "Fluorescent Forum: The Crystal Faces of Fluorescence", by M. Robbins, on an article on Colorado scheelite by R. Cook, and reviews of the same two books reviewed in the Jul./Aug. *U.V. Waves*, plus a third (*Nature's Hidden Rainbows*).

I have not yet seen my copy of the *Rock & Gem* issue. Most of the authors above are FMS members.

Nomenclature in the Scapolite Group

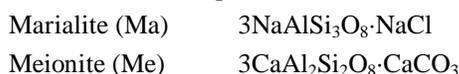
by Earl Verbeek, #437, NV, and Pete Modreski, #157, CO (FMS Tucson Display Committee)



As preparations for the display of 70 cases of fluorescent minerals at the 1996 Tucson Show are being made, the question of how some

specimens might best be labeled has been a continuing concern. Nowhere is the potential for confusion greater than in the scapolite group, bright yellow-fluorescing specimens of which commonly are labeled "wernerite" in private collections. Below we briefly review the nomenclature of the scapolite-group minerals.

Scapolite, as the term is now used, refers to a group of tetragonal silicate minerals that form a solid-solution series between a calcium-rich end member and a sodium-rich end member. Names and compositions of the two end member species are:



Most authorities consider the midpoint of the chemical series ($\text{Ma}_{50}\text{Me}_{50}$) as the dividing line between the species marialite (Na-rich) and meionite (Ca-rich), just as the olivine series is divided into magnesium-rich forsterite and iron-rich fayalite. In the past, not two but four different mineral names were used for the scapolite series, with names and compositional ranges as follows: meionite ($\text{Me}_{100}\text{Ma}_0$ to $\text{Me}_{80}\text{Ma}_{20}$), mizzonite ($\text{Me}_{80}\text{Ma}_{20}$ to $\text{Me}_{50}\text{Ma}_{50}$), dipyre ($\text{Me}_{50}\text{Ma}_{50}$ to $\text{Me}_{20}\text{Ma}_{80}$), and marialite ($\text{Me}_{20}\text{Ma}_{80}$ to $\text{Me}_0\text{Ma}_{100}$). Current usage, however, is to use only meionite and marialite as species names, in accordance with the recommendations of the Commission on New Minerals and Mineral Names (CNMMN) of the International Mineralogical Association. These are the only two names used in current reference books such as Nickel and Nichols (1991), Deer and others (1992), Fleischer and Mandarino (1995), and Anthony and others (1995). (The composition of scapolite is even more complex than indicated by the ideal formulas above, because it may also contain sulfate (SO_4), and some sodium-bearing meionite actually contains little or no chlorine).

The term wernerite has a long and troubled history. Since the origin of the name by d'Andrada in 1800, it has been used sometimes as a "species" name for intermediate members of the marialite-meionite series, and sometimes as an overall synonym for scapolite. Bates and Jackson (1987) list wernerite as being synonymous with dipyre, whereas Mitchell (1979, p. 200) calls it a synonym for the scapolite group. Because of the inconsistent use, the CNMMN

ruled in 1986 that the name wernerite would be discarded as being synonymous with scapolite, and therefore unnecessary (Bayliss, 1987).

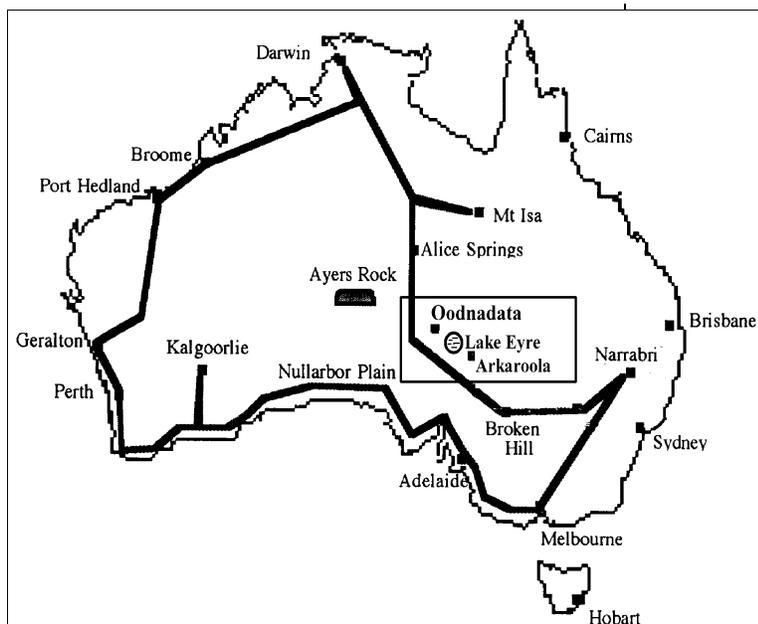
In none of the above uses is the fluorescence of the mineral germane to the definition. Some of the hobbyist literature on fluorescence, however, reveals a quite different viewpoint--a tendency for any bright yellow-fluorescing scapolite to be termed wernerite, regardless of composition. This usage probably came about because of the widespread distribution, during the 1940's and 1950's, of specimens of fluorescent scapolite, labeled as wernerite, from the Lawrence-McGill farm in Quebec. Such specimens were prized for their intense golden-yellow fluorescence and quickly found their way into early collections of fluorescent minerals. By analogy, any similarly fluorescing scapolite from other localities often was labeled wernerite; the practice continues to this day. The name wernerite has had so many different and conflicting meanings that the utility of the term has been lost. Thus, the CNMMN has recommended its abandonment. Accordingly, the name wernerite will not appear on specimens of fluorescent scapolite on display in group cases at the Tucson show. They will instead be labeled "Scapolite", perhaps together with the appropriate species name (meionite or marialite), where known.

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Outback Fossicking II - The Oodnadata Track

by Dr. J. R. Forster, #599, California



In the previous episode Carol and I had just left the mining town of Broken Hill, New South Wales, Australia, and were heading for the Flinders Ranges in South Australia. Our destination was Arkaroola, notable for its abundance and diversity of minerals. This part of our journey was through semi-arid, mountainous land filled with kangaroos, emus and parrots. It was mid-December, and very hot.

We decided to leave the highway and take a shortcut through the foothills of the southern Flinders Ranges. After many hours of uncertain traveling on unmarked dirt roads we found ourselves at Blinman, a once-busy copper mining town in South Australia. That night I tried my luck at the long-abandoned copper mine on the edge of town. There was a crescent moon which made finding fluorescents difficult, but I was attracted by a bright coating on some small pebbles. These parti-colored coatings came in subtle shades of orange, blue and purple, and seemed painted on the rocks. I thought they were peculiar then, but they are now among my favorites. I imagined a potent brew of chemicals slowly transforming the surfaces of those rocks over time.

We left Blinman and headed up the range toward Arkaroola. The Flinders are the eroded remnants of a 24 km thick bed of quartzite, shale, and limestone called the Adelaide Geosyncline. This grand and rugged range extends some 435 km from the SA coast nearly to Lake Eyre. In the north-east corner of the range lies Arkaroola, previously a sheep station and now a nature sanctuary. The rocks around Arkaroola are ancient, up to 1600 million years old, much older than the Adelaide deposits that were laid down between 500 and 1100 million years ago in a shallow sea

trough. There are plenty of old mines on the 60,000 hectare (235 sq. mi.) holding, and it is open for picking if you stay in the resort's caravan park or one of its hotels. We did not come away with many fluorescent minerals from Arkaroola, but we did find nice specimens of actinolite, tremolite, magnetite, malachite, and albite.

Reg Sprigg, retired geologist and owner of Arkaroola, gave us maps and suggestions on where to look. At the pinnacles, a white granite pegmatite jutting out of the sediment, we found orange feldspar mixed with quartz that fluoresces a rich red under shortwave ultraviolet. We saw a family of yellow-footed wallabies there, jumping around on the steep rocks with amazing speed and agility. The drive to Wheel Turner turned

up some nice malachite, but the four wheel drive track took several years off both us and the Subaru. We camped that night far from Arkaroola Village at Yudnamutana, which still shows evidence of a once-large mining operation. The amount of actinolite in that place is amazing! Huge boulders and entire hillsides of the green, fibrous mineral are everywhere. At night, bright green fluorescent coatings could be seen on the actinolite where water had deposited uranium-bearing silica or calcite on its surface. It is owing to the feverish search for uranium during World War II that this rugged and beautiful area was explored.

We left the Flinders Ranges that evening and drove a short distance to Copely to look for the willemite prospect Reg had told us about. At a quiet spot a few miles outside town where the road crosses the creek we spent the night with galahs, fork-tail kites, corellas and mulga parrots for company.

We got directions to the EZ (Electrolytic Zinc) mine from friendly locals at the Copley roadhouse. The mine was closed but well kept under the care of "Sandhill" Jack Johnson. Jack was 82 years old in December 1989 and got his nickname from delivering goods north from Leigh Creek under any conditions. Jack showed us the large open pit and talked about the extensive suite of minerals found here, including fluorescent willemite, calcite and adamite. Carol and I returned that night with our UV lamps and were delighted to find abundant fluorescent willemite and calcite mixed together in thin, folded layers. I put the largest boulder I could lift into the Subaru before

(continued on next page)

Outback Fossicking II, continued

heading back to camp. There I broke the boulder into pieces, saving the best of the fluorescent material to ship back to California. I spent a wonderful night breaking up that boulder and marveling at the red calcite mixed with cream and yellow willemite under the short-wave lamp. The willemite had a strong and long-lasting phosphorescence, occurring in distinct bands of green and yellow.

Our next major destination was the famous silver-lead-zinc deposits at Mt. Isa, Queensland, about 1200 km north. We wanted to take the famous Birdsville track, but there had been rain which can make the dirt roads treacherous. At Maree we learned that Coopers Creek was in flood and the main road impassable, but a bloke who claimed to have built the ferry across Coopers Creek gave us a 75% chance that they would get us across there. We called the Birdsville police department and were informed that if we did get to Birdsville we couldn't get out because all roads to the north were impassable. It seemed the only option for reaching Mt. Isa was to take the 700 km Oodnadata track to the Stuart highway, drive 400 km north past Alice Springs to the Plenty highway, then 800 km east to the Isa. We were well into the rainy season, so parts of that route could also be flooded.

We stopped briefly at Lake Eyre South, which had plenty of water and was populated by black swans and sandpipers. There we found beautiful fluorescent gypsum crystals along the banks of the lake. Large flat crystals of selenite were easily spotted sticking out of the mud, with shiny surfaces up to 15 cm (6 in) across and a few cm thick. Under both shortwave and longwave UV the crystals fluoresced a bright yellow, somewhat brighter under shortwave. There was no trace of phosphorescence, which is often characteristic of biological activators. The fluorescence is strongly zoned along irregular boundaries, but appears to be controlled by crystal faces. There is no evidence of these fluorescent boundaries in daylight, even though the crystals are water-clear.

We traveled on to William Creek where we stayed the night and enjoyed the outback hospitality of the pub proprietors, Joe and Rose Westover. After a steak barbecue and a good nights sleep I went fossicking with two of the kids (Erin and Emilee) along nearby Breakfast Creek. We found many large selenites, but

none with the bright fluorescence of the Lake Eyre South crystals. Around noon Carol and I headed on to Oodnadata on an outback track made in hell. After miles over tooth-rattling dirt road we ran into a deep pocket of bull dust, fine silt blown by the wind which collects in low spots like bowls of bath powder. For the next 100 km the Subaru ran badly, overheating through the Peake Range and sputtering and stalling most of the time.

At Oodnadata we stayed at the Pink Roadhouse, operated by one of the few white people in a town of several hundred aboriginals. Although there were no interesting rocks there, we stayed four days trying to get the Subaru and Cubbaroo (the caravan) back into shape. I won't relate the trauma of losing a tiny carburetor part in the gravel, or ordering unnecessary engine parts from Port Augusta. Suffice it to say we were glad to get back on the track at last, even though Cubbaroo's new steel water tank was leaking and the brake cables had already begun to abrade. The trip from Oodnadata to the Stuart highway was made memorable by large parties of budgerigars (wild parakeets). Near a pond we watched hundreds of the tiny parrots swooping and lighting on the water, making a fantastic ruckus. Also present were bustards (wild turkey), galahs (pink-breasted cockatoo), zebra finches and wild cockatiels.

The paved highway was a relief after the dirt track, and I was eager to get to the Harts Range in the Northern Territory for the dark of the moon. During our eight years in Australia we had run across several beautiful zircon crystals with a brilliant yellow fluorescence. At the turnoff to Ayers Rock, the famous landmark at the center of Australia, we had a decision to make. We were about 400 km from Mud Tank, the fossicking area where these zircons are found. I argued that a visit to Ayers Rock would mean a 500 km detour, plus at least one overnight stay in an expensive caravan park full of tourists. Carol argued that this was a once in a lifetime opportunity to see one of the world's most marvelous monuments, known to be incredibly beautiful at sunset and thought to have great spiritual power. In the end we did not go out to see it, and I still feel awful whenever I hear "What! You didn't visit Ayers Rock?"

(To be continued in a future issue)

Looking Ahead

Feb. 8-11	Tucson, Arizona	Many shows and FMS 25th anniversary presentations (see last issue).
Feb. 20	Pasadena, California	FMS meeting
Mar. 19	Pasadena, California	FMS meeting
Aug. 9-11	Riverside, California	AFMS/CFMS show, The Riverside Convention Center; possible field trip to Crestmore Quarry (see <i>U.V. Waves</i> of March/April 1995)

Fluorescent Mineral Photography Talk at Tucson



At the Tucson show, Jeff Scovil's Mineral Photography Seminar will begin with a 40-minute presentation on "Photographing Fluorescent Minerals" by Dr. Peter Modreski (FMS member #157). The seminar is scheduled for 1:30-4:00 P.M. on Thursday, February 8, at the Convention Center's Copper Ballroom.

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The FMS, Inc. board meets the third Tuesday of each month at 7:30 p.m. at the Glendale Federal Bank Community Room, 722 E. Colorado Blvd., Pasadena, California (at the corner of Colorado and Oak Knoll). Any or all FMS members are welcome to attend these meetings. The registration fee for new FMS members is \$2.00 (U.S. \$3.00 for those outside the U.S.A.), plus yearly dues of \$15.00 for members in the U.S.A., U.S. \$18 for non-U.S.A. members receiving FMS publications by surface-mail, and U.S. \$23 for non-U.S.A. members receiving FMS publications by air-mail.

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