21st ANNUAL

Franklin-Sterling

MINERAL EXHIBIT

The Fluorescent Mineral Capitol of the World

Sat. & Sun., October 8th & 9th, 1977

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Edward C. Edsall  
MAY 25, 1918 - JUNE 23, 1977

The Franklin Kiwanis Club, the Franklin Mineral Museum, the Mineral Show and the Boy Scouts of America lost a "rare gem" this summer when Ed Edsall lost his life in an automobile accident.

Ed devoted much of his adult life to foster the Boy Scouts movement. He was Scoutmaster of Hamburg Troop 152 for 17 years, he was District Chairman of Camping and Activities Committee of the Morris-Sussex Boy Scout Council and assisted 12 Boy Scouts to attain the rank of Eagle Scout. For his work in Scouting, Ed was awarded the District Award of Merit and the Silver Beaver, the highest Scouting Award.

Ed was past President and Director of the Franklin Kiwanis Club, with 7 years of perfect attendance and was a director and Chairman of Grounds Committee of the Franklin Mineral Museum. He also was chairman of the Hamburg Board of Adjustment. Ed was the kind of a man, that when work was to be done, he was always there, regardless of adverse conditions, serving efficiently and honorably.

We dedicate this 1977 Mineral Booklet to the memory of Edward "Bud" Edsall, devoted husband, father and grandfather, a very productive Kiwanian, a dedicated Scout Leader and an active citizen, devoted to the betterment of his community. We indeed lost a "rare gem"!
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MINING AT FRANKLIN — SYNOPSIS

By CLARENCE Haight, former Mine Superintendent at Franklin

A mine is mysterious to many people because it cannot be seen in its entirety. If the Franklin mine was inverted and placed on the surface, it would have required a building about a mile long, five hundred feet wide and one thousand feet at its peak to enclose it.

The "floors" were known as levels, and they were fifty or one hundred feet apart rather than the eight-ten feet of office buildings. There were eighteen levels at Franklin and these levels were connected by shafts containing the mining version of elevators for men and materials as well as water and air pipes, and phone and electric cables.

The hallways from the elevators to the working areas were tunnels, called drifts. Tram cars were frequently operated in the drifts to haul materials and men. The drifts were occasionally intersected by cross-cuts, which were tunnels extending from the footwall to the hanging wall to provide access, remove broken ore, etc. If drifts were the avenues, cross-cuts were the streets.

Ore bodies do not occur in rectangular blocks as buildings do. The outer-limits of the ore bodies are usually at an angle with the horizontal. Standing within the ore body, the outer side of the body which would be above your head (has an acute angle with the horizontal) is the hanging wall; that which would be beneath your feet (forms an obtuse angle with the horizontal) is the footwall.

When the ore is thick, as it was at Franklin, it is usually mined by transverse stopes. Franklin was first mined by tunnels at fifty foot levels. After consolidation of the various mining companies, engineering studies led to mining by transverse stopes. In essence, this comprised removing ore in sections seventeen feet wide running from the foot wall to the hanging wall. Between each scope, a pillar was left. Each pillar was about thirty feet wide and ran from footwall to hanging wall (as much as 300 feet) and to the top of the mine (up to one thousand feet high).

When all the ore was removed except for the pillars, a system of top slicing was introduced to utilize the ore in the pillars. This comprised taking ten foot deep slices from the pillar, starting at the top of the pillar, across from footwall to hanging wall. In essence, a narrow opening of full height was first cut through the center of the drift to the hanging wall. The opening was then opened to full (thirty feet) width from the far end and worked back to the original opening. As the load on the supports became too heavy, (at about ten foot intervals), the supports for the cleared area were blasted and the load above caved to minimize the load on the working area.

Franklin ore averaged about a ton for each seven cubic feet. Some twenty million tons of ore were removed at Franklin. The ore averaged 20% zinc.
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COMPLETE ITALIAN AMERICAN MENU
FLUORESCENT MINERALS  
FREDERICK KRAISSL, JR., M. PHIL., P.E.  
President, Franklin Mineral Museum, Inc.

Since both the New Jersey Assembly and the Senate have enacted resolutions commemorating the Franklin-Ogdensburg Mining District as the Fluorescent Mineral Capitol of the World, it seems obligatory for the personnel of the Franklin Mineral Museum to be a source of information concerning this subject.

It has amazed me that many scientists in other fields know so little about the phenomenon of fluorescence. I have had engineers and others who visited our consulting office in Hackensack, New Jersey exclaim at the fantastic colors some specimens produce. Consequently programs concerning this subject are being featured at the museum.

While it is not considered desirable to make a complicated explanation of this subject, it is believed that without understanding some fundamentals, observation of what is being experienced will not be appreciated.

Most people understand in a general manner the relationship of the solar system, where the sun can be likened to the nucleus of the atom, and the planets in a general way to the neutrons and electrons. It has been fairly well established that color can be produced by the activation of the unpaired electrons of the ionic crystals of the transition elements that can be present in fluorescent minerals. It is also a fact that lattice defects in crystal structure in certain elements and compounds can trap unpaired electrons which will then function similarly to the unpaired electrons in the transition elements. These have been designated color centers.

It has been established by Professor Karl Przibram that these trapped electrons can be expelled from these lattice defects by heating the mineral from between 200-300° centigrade under which circumstance the fluorescent color is bleached out. Consequently this has led me to term this condition Impermanent Fluorescence. Investigating fluorescence can be done by both long wave ultra violet radiation generators producing 3660 A wave lengths and short wave generators producing 2537 A wave lengths or both. According to my interpretation of the Quantum Theory developed by Max Planck, the energy rays impact on these unpaired electrons and cause them to jump to the next higher energy level permitted to them, and when they return this energy is transmitted in the form of visible light of the color wave length characteristic of each electronic configuration.

Permanent Fluorescence due to the unpaired electrons in the transition elements cannot be bleached by heating to 300° Centigrade according to current knowledge, so we have a means for differentiating Impermanent from Permanent Fluorescence. Furthermore by making use of nuclear engineering formulas it can be shown that even the highest energy level ultra violet wave length of 2537 A cannot develop an electron volt activation of greater than...
5 electron volts. Schulman and Compton have shown in their "Treatise of Color Centers in Solids" that lattice defects in crystal structure can be accomplished by energy output of from ten through soft x-rays up to high energy protons of 100 Me V. This makes it seem clear that none of our ultra violet investigations can cause crystal lattice defects, so that our ability to differentiate is not being invalidated. This is important to me, as I have set up a project to attempt to determine the transition elements that cause fluorescence in various minerals.

As an example most investigators know that the transition element that causes fluorescence in our Manganese Willemite at Franklin is Manganese. It is believed this must be present in between ½ to 5% to be effective. Past 5% the mineral approaches Tephiroite which is non-fluorescent. On a field trip to the Andover Quarry a mineral was found that identified as Willemite, but fluoresced ivory to light yellow. It was subsequently reported that this was due to the transition element copper. It would be good to verify this component by documentation as well as the necessary percentages.

Programs regarding Fluorescence are now available at the museum, and it is intended more will be forthcoming. The Fluorescent Room is a good starting point for acquaintance with this fascinating subject. Documentation of Fluorescence by photography is a tricky subject. It is known that both plastic and glass will filter out the short wave 2537 A radiation. However the 3660 A long wave length will go through both plastic and glass and place an erroneous blue image on photographic color film that produces a completely wrong result. It has been suggested that this be counteracted by using a yellow filter, but I have often wondered how this could be quantitatively accomplished.

It seemed preferable to develop a filter that was relatively water white that would filter out the undesired long wave length. This is important because even with short wave radiation there is a long wave peak that produces this erroneous result. I have produced such a filter, and while it is important with megascopic fluorescent photography I consider it essential with fluorescent photomicrography as the sources of radiation are so near the microscope objective to have a very profound effect.

In recent lectures and slides that are available at the museum, this has been conclusively shown, and we consider this selective wave length filtration an important tool in dealing with this subject. It is expected that as this technique and the results of it are applied and continued that interesting data will be acquired and made available to members of the museum, as an integral part of our program to make the museum the Study Center for Franklin Minerals. I might add in this connection that I have classified as Franklin Minerals those originating in the Franklin Limestone, regardless of the ore body or quarry in which they were obtained, although the location of place of origin is considered very important, and is stated as a reference, and in many cases the reporting individual when known.
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Member Federal Deposit Insurance Corporation
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THE MINERAL EXHIBIT AND MUSEUM

The Franklin-Sterling Mineral Exhibit is sponsored by the Kiwanis Club of Franklin as a non-profit community project. The Kiwanis Club has also established The Mineral Museum and Mine Replica as a permanent display of the minerology and mining history of the area.

The Museum is operated by the Franklin Mineral Museum Inc. and contains permanent and loaned collections of unusual interest. It also houses a spectacular display of fluorescent minerals whose brilliant colors may be viewed under Ultra-Violet light. The Replica Mine, located in the original Engine House used to hoist ore from the Open Cut, simulates actual mining operations in the Franklin Mine.

Proceeds from the Mineral Exhibit and Museum and Replica Mine are used to maintain and develop the Museum as a permanent repository of Franklin-Sterling minerals in the expectation that it will become the definitive collection of this unique minerology.

The Trustees of the Museum welcome permanent gifts and loans for display. All gifts and contributions are tax exempt. Sponsors, Patrons and Donors or cordially invited to solicit further information.
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FRANKLIN PROJECT: Members of the Kiwanis Club of Franklin are shown preparing a “Replica Mine”. One of the major projects of the club is a Mineral Show and this “Replica Mine” and buildings were constructed for atmosphere and to better display the many minerals. Ore and tailings are placed on both mine levels as well as in the ore car.

OUT OF THE PAST

We reproduce here a photo and caption as it appeared in the JERSEY KIWANIAN of October 1962. Former Kiwanians working on the Replica are: left foreground - Carroll Glynn, far left - Robert Meyer, center - Richard Dolsen, right background - Raul Provst, right foreground - Neil C. Cates.

Our thanks to Mrs. Carroll Glynn for contributing the above photo and article.
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