the Mineralogical Record

Volume Six/Number Four
JULY—AUGUST 1975

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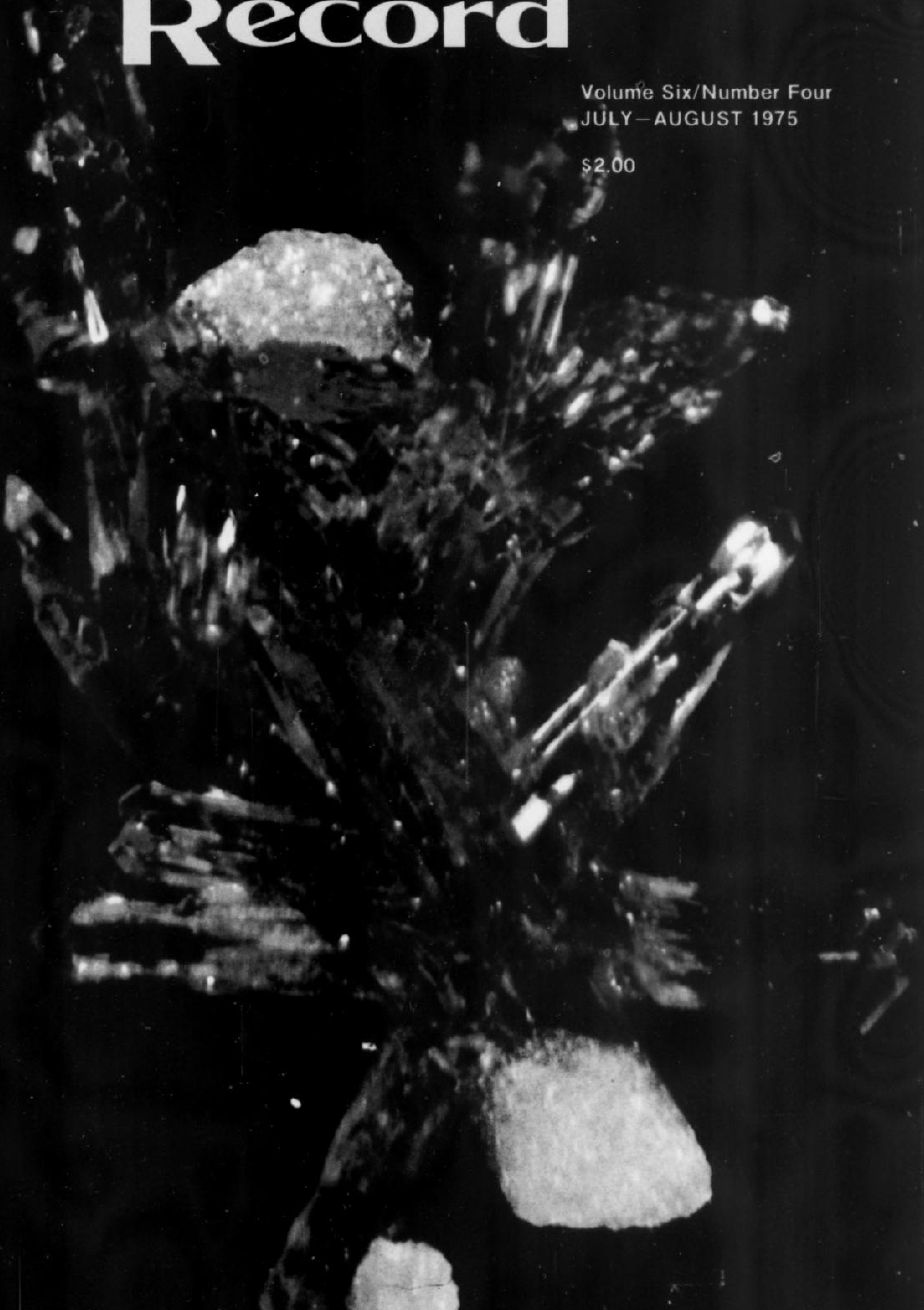

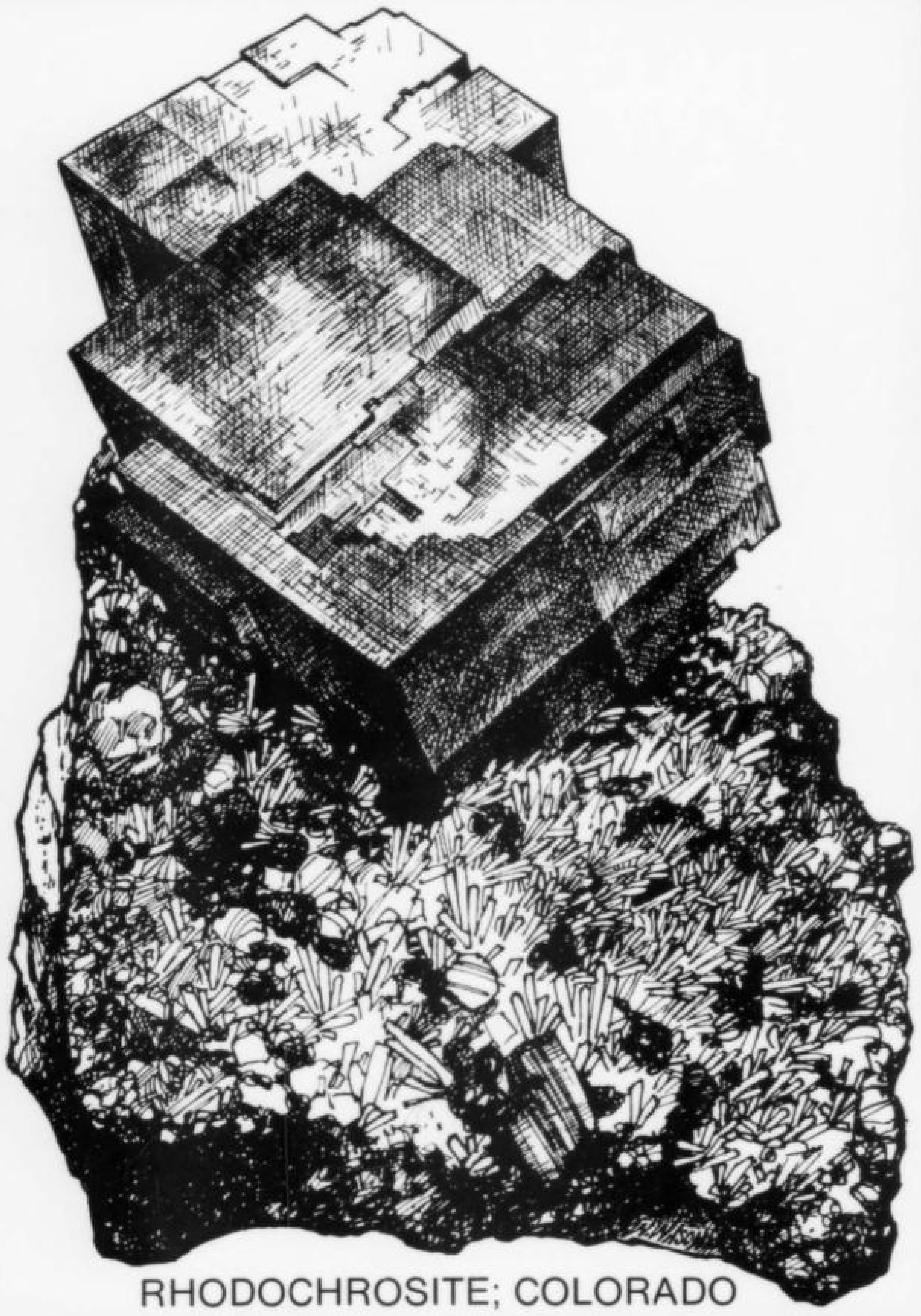

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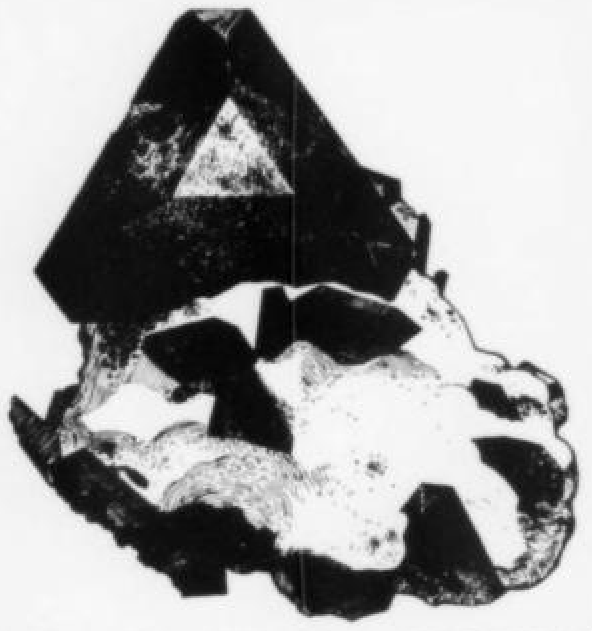

BENITOITE; CALIFORNIA

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July—August, 1975

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Dioptase with mimetite. Mammoth St. Anthony mine, Tiger, Arizona. A photomicrograph by Vi Frazier of Point Arena, California. This was the winning slide in the competition at Tuscon, 1975.

Guest Editorial

THE TUCSON SHOW-1975

by William B. Sanborn

The following was written as a letter to a collector who has never been able to attend the Tucson Show...

Well, another Tucson Show is over and you have asked for a report since you have never been to one of them. Glad to oblige, but keep in mind that the following are simply one person's offhand reactions or observations. Many participants might not agree with me!

First of all, someday someone will probably get his Ph.D. by doing an analysis of the how, when, and why the Tucson Show has become what it is - by far the best of many outstanding U.S. shows. It has seemingly grown "like Topsy" and has increased in attendance, quality, stature, and problems each year.

Somehow the show has become the really "big one" and probably for a composite of reasons. It has been sponsored and very well organized by an energetic and articulate group, The Tucson Gem & Mineral Society, Inc. Tucson is an attractive community - especially in early February when foul weather dominates much of the U.S. Also, the new convention center is handsome, spacious, and provides a fine atmosphere for the show. The fountains surrounding the facility are great!

There is also the factor of the proximity of Tucson to Mexico. There is absolutely no doubt that many of the outstanding Mexican finds of the last several years have been "sprung" at the Tucson Show. Both Mexican contacts and U.S. dealers and collectors seem to have caught on to this gimmick. It is a real drawing card for the discriminating collector and lends a legitimate air of potential excitement to the show. This year, however, I did not see any new Mexican material that even remotely compared with past years' offerings: legrandite, adamite, smithsonite, arsenopyrite, fluorite, vanadinite or wulfenite.

There is also the factor that this show has definitely become associated with an international flavor! Many collectors and dealers from other countries attend. I talked with several from France, Germany, Spain, Belgium, England, and Australia. In addition the show has gained tremendous stature by the presence of a number of well known mineralogical luminaries (curators, authors, or collectors) who attend. Where else might you have the chance to talk to, or hear a presentation by the top mineralogical authorities from the United States, England, France, and Spain at the same meeting?

The show also attracts an astonishing array of dealers, now on a worldwide basis. The top dealers assuredly add a great deal to the appeal of the show. Incidentally, I get damn' fed up with the sniping done by some of the so-called "professional" mineralogists or sanctimonious scientists who tend to throw rocks at the dealers! Many of the dealers (I can think of at least five) are first-class mineralogists and probably know locality differentials as well as anyone in the world - either in or out of a museum. There were more dealers, by far, both in and out of the official show, than in past years.

The overall quality of the dealers' materials at Tucson always seems to be better than average. However, combining both floor vendors and those in the local motels/hotels, I did see junk offered; such as gaudy specimens of homemade chemical crystals, plastic trilobites; the usual run of "dog rock type" specimens; and Navajo jewelry of obviously dubious origin - perhaps Hong Kong, Korea, and New Jersey.

Prices for specimens at the booths? Generally high. They ranged from some very fair priced items that quickly ascended a scale ranging frgm exorbitant to absurd. I agree that well selected, quality specimens are a good "investment," but also noted that virtually all of the specimens in the hundred - even several thousand - dollar categories were still awaiting purchasers when I left the show.

The show opens officially on Friday morning and runs through Sunday. However, forget the first couple of hours on Friday, since this is the Moppet Melee. The school children of Tucson visit the show - quite deservedly - so just don't attempt to swim against the current!

The wholesale mineral dealers' section opens up on Thursday morning to those presenting appropriate credentials. I use my consultancy card to get in. This year the wholesale dealers (poor souls) were jammed into miniscule quarters under the bleacher areas in the enclosed stadium. Getting in and out fostered an appreciation of how sardines must feel in the can. There was some very nice material at the wholesalers' - most of the choice items were gone within a half hour. Material may or may not be keystoned in price.

Now, the really interesting aspect of Tucson! This is the factor that I gather drives the sponsoring society wild - or at least some of them. This is the "Second Show," or for many "The Real Tucson Show" which takes place in dozens of rooms in the Desert Inn, Braniff House, and Holiday Inn. Some refer to this as the "pre-show sales" activity. Word has been out for years that this is "where all the real action is" and that "the good material turns up here first." Well, that is not completely true, but a heck of a lot of excellent material shows up here that never makes it to the prime show floor! The room action usually begins by Monday of the conference week!

There are many regulars, particularly at the Desert Inn, both dealers and/or collectors, who offer a wide variety of materials for sale. You never know who or what will show up "in the rooms." This has generated a sort of fraternity of Room Do-ers, and this has become a truly enjoyable and fascinating aspect of the Tucson Show. Most (not all) of the superlative material at Tucson may surface first via the room route. It is my understanding that dealers, or even personalities, who "pre-sell," "tail-gate" or "room-gate" are threatened with blacklisting from the main show. Good grief. Big deal!

It does not appear to me that the Society has any lack of business. Many dealers tell me that it is very difficult to book space for the show. One gathers that if a "floor dealer" were to be caught selling at The Desert Inn he would be expelled from future floor booth participation. Perhaps this is hearsay, but there are strong feelings, both pro and con, on the subject.

Insofar as I'm condemned, I think *both* Tucson Shows are great. In a somewhat facetious manner, I get the feeling that if the Society were to collapse a Tucson Show would go on anyhow!

Price structuring in the rooms varies considerably. It is definitely helpful if you *know* something about fine minerals. Prices may be list, keystoned, various %'s off, or whatever the vendor thinks he can get out of an individual customer. *Caveat emptor*!

It is always interesting to be able to render *your own* opinion regarding some recent "major find" - and both the regular show and the motel rooms usually provide this. For example, the Maine elbaite tourmalines which were thoroughly discussed in the January/February 1975 issue of *Mineralogical Record* were shown in one of the rooms. By no stretch of the imagination, at least based on what was being shown, are these up to the grand mental pictures one might conjure from the article. They are interesting, but no match (other than their fine green color) for the crystal specimen quality of the San Diego County materials - both old and new.

As usual, the exhibits at the main show were superb! This is perhaps the No. 1 attraction (at least for me) of the show. The quality of exhibit is tops. The Smithsonian (U.S. National) had a great case of zeolite and related minerals; and the American Museum of Natural History case included an apple-sized sixling of yellow-green chrysoberyl that simply had to be seen to be believed! There was a private case displaying an 8"x10"x2-1/2" plate of magnificent brilliant deep orange crocoite crystals from Tasmania that really drew the crowds. In any event, dozens of exhibits, most of them first class. Only three of the exhibits contained any explanatory (educational data) other than just labels. A shame.

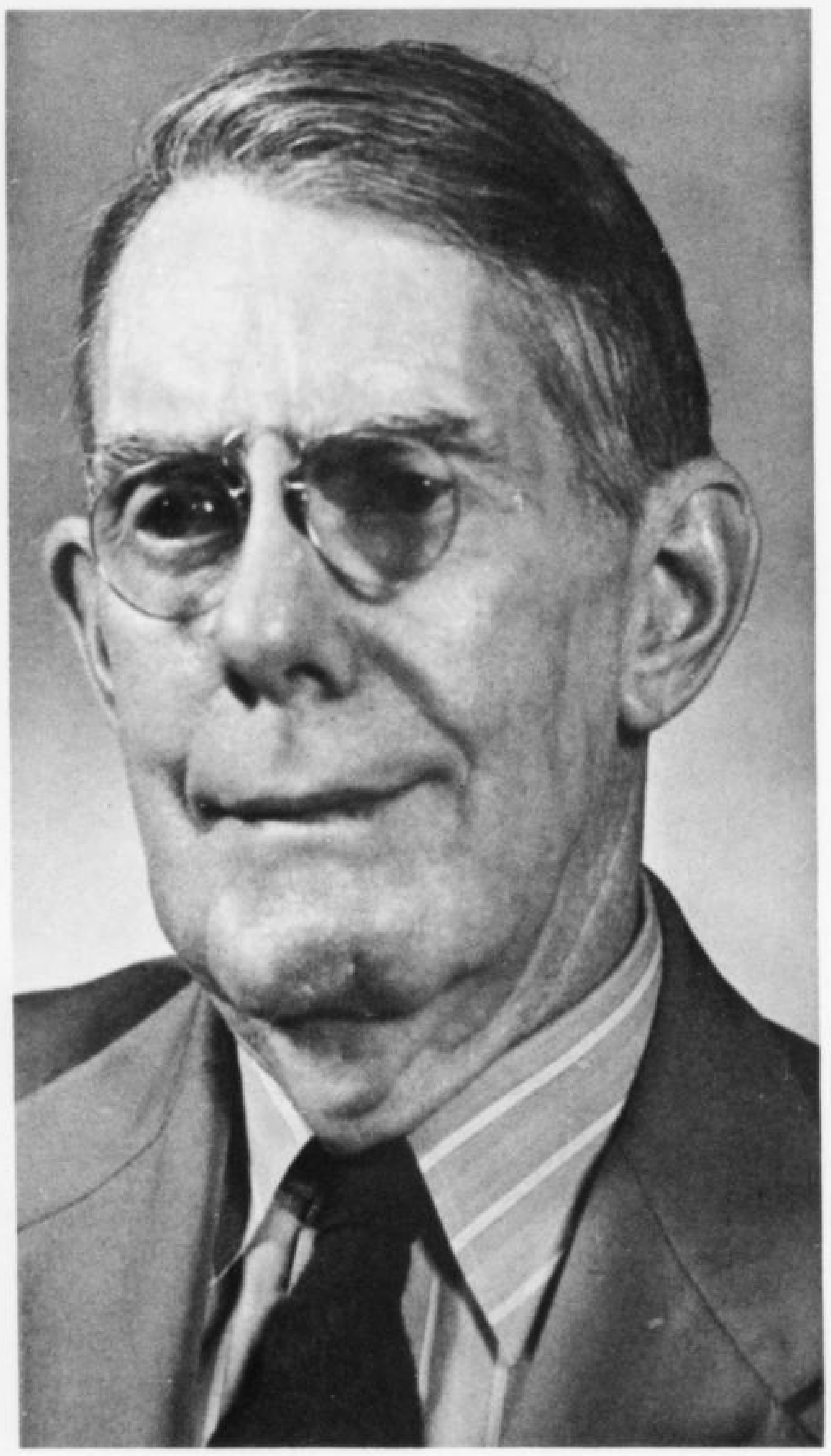
Oh yes, two of the truly outstanding exhibits of crystallized minerals were displayed via the courtesy of two dealers. This is, of course, a welcomed display of quality material but also a neat advertising dodge, since reference to an "award winning collection for sale" often appears on behalf of at least one of the dealers involved. But - what the hell.

What did I get? Well, admittedly, I spent about 75 per cent of my available funds "in the rooms" and the rest on the show floor. I managed to come up with some 28 nice additions - four for the display cabinets, and the rest very choice miniatures. There were really no truly "sensational" new finds; however, at the Desert Inn I got some superb, very showy, heulandite and stilbite from Australia. The heulandite is of a bright tangerine color and the stilbite a strong peach hue. Also picked up a beautiful fist-sized translucent to transparent topaz of fine ice-blue color from a purportedly "new" locality in Minas Gerais.

In summary: Great time - fine show - both of them! Bargains virtually non-existent; prices high. I do not think any dealers made a killing this time. Lots of people; lots of looking; very little money. Super exhibits; a few nice additions for the collection. Saw many old friends and made a few new ones.

Next year? I have made reservations again. Yup, you guessed it - the Desert Inn - friendly, somewhat shabby, wretched food, but that's where "the action" will probably be in '76.

Why not join us?



Clarence Samuel Ross

September 20, 1880 - April 19, 1975

Mineralogy has lost one of its giants with the recent death of Clarence S. Ross, who worked at the U.S. Geological Survey for 51 years. He had joined the Survey in 1917, after obtaining his bachelor's, master's, and doctor's degrees in geology at the University of Illinois. Although formally retired in 1950, he continued his work until 1968, when a painful arthritic hip forced his retirement.

His work covered an unusually broad spectrum of geology, ranging from oil and gas resources, copper deposits, and titanium deposits to the petrology of ultramafic and rhyolitic rocks. Best known, however, is his work in mineralogy, especially clay mineralogy. In a series of papers with P. F. Kerr, S. B. Hendricks, and E. V. Shannon, Ross clarified the structural and chemical relationships of the kaolinite and montmorillonite groups. He described the new minerals dickite, alleghanyite, and clarkeite, but more important was his reordering of the clay minerals, relegating some mineral names to the synonymy, and rescuing such valid species as nacrite and sauconite.

With the advent of the electron microprobe, analyses of coexisting minerals have become commonplace, but Dr. Ross more than 20 years ago realized the importance of such data and painstakingly carried out the necessary tedious separations of the minerals of olivine-rich inclusions. His work was a landmark in the study of the origin of ultramafic rocks.

In later years, Ross and R. L. Smith mapped the Jemez Mountains, New Mexico; this work led to a detailed study of ash-flow tuffs and their origin. This is one of the most widely quoted research papers in geology of recent times, as are many of Dr. Ross's other papers.

Dr. Ross received many honors during his career. He served as president of the Mineralogical Society of America in 1935 and received its highest award, the Roebling Medal, in 1946. He was designated Orton Lecturer by the American Ceramic Society and received the Distinguished Service Award of the U.S. Department of the Interior in 1950. In 1963, the University of Illinois conferred on him the honorary degree of Doctor of Science. The new minerals rossite and metarossite were named for him in 1927.

The following references are to a few of Ross's most noteworthy publications:

C. S. Ross and P. F. Kerr, The kaolin minerals, *U. S. Geol. Survey Prof. Paper 165*, p. 151-180 (1931)

C. S. Ross, Origin of the copper deposits of the Ducktown type in the southern Appalachian region. *U.S. Geol. Survey Prof. Paper 179*, 165 p (1935)

S. B. Hendricks and C. S. Ross, Chemical composition and genesis of glauconite and celadonite. *Am. Mineral.* **26**, 683-708 (1941)

C. S. Ross, Occurrence and origin of the titanium deposits of Nelson and Amherst Counties, Virginia. *U.S. Geol. Survey Prof. Paper 198*, 59 p (1941)

C. S. Ross and S. B. Hendricks, Minerals of the montmorillonite group, their origin and relation to soils and clays. *U.S. Geol. Survey Prof. Paper 205-B*, p. 23-79 (1946)

C. S. Ross, M. D. Foster, and A. T. Myers, Origin of dunites and of olivine-rich inclusions in basaltic rocks. *Am. Mineral.* **39**, 693-737 (1954)

C. S. Ross and R. L. Smith, Ash-flow tuffs — Their origin, geologic relations, and identification. *U.S. Geol. Survey Prof. Paper 366*, 81 pp. (1961).

Michael Fleischer
U.S. Geological Survey
Reston, Virginia 22092

FM friends of mineralogy

SECOND BIENNIAL MSA-FM MEETING:
TUCSON, ARIZONA
FEBRUARY 14-15, 1976

"CRYSTAL CHEMISTRY AND PARAGENESES OF THE GEM MINERALS"

The first joint Mineralogical Society of America-Friends of Mineralogy meeting was held in Tucson, Arizona in February, 1974. In conjunction with the annual Tucson Gem and Mineral Show, the program provided the opportunity for professional and amateur mineralogists to contribute toward a successful program.

The second Biennial Meeting shall include two keynote speakers (R. H. Jahns: "Gem-bearing Pegmatites" and Rustum Kothavala "Mineralogy of the Deccan Traps"). Twenty-four titles are solicited for the technical sessions which include Session I on gem mineralogy (12 papers) and Session II on general topics (12 papers). Each presentation shall be 30 minutes in length with an additional 10 minutes for discussion.

Owing to the range of interests of the audience and technical sessions participants, general papers of a broad scope are favored over highly specialized topics. Problems in descriptive mineralogy, crystal chemistry of gem materials, new occurrences and distributions of gem minerals are especially welcome.

Titles of the papers, with a two sentence outline of the theme, should be mailed to:

Professor Paul B. Moore
Department of the Geophysical Sciences
The University of Chicago
5734 South Ellis Avenue
Chicago, Illinois 60637

It is hoped that contributions from MSA and FM members will be about equally divided.

DEADLINE FOR TITLES: AUGUST 31, 1975

Other pertinent dates:

1) Announcement of pre-registration: July-August issue of *Mineralogical Record*
2) Notification of acceptance (or rejection) of papers: September 30. If accepted, a 250 word abstract will be requested.

SECOND BIENNIAL MSA-FM MEETING
TUSCON, ARIZONA
FEBRUARY 14-15, 1976
ADVANCE REGISTRATION

Owing to heavy attendance at the concurrent Tuscon Gem and Mineral Show, it is urged that prospective attendants of the Mineralogical Society of America-Friends of Mineralogy Second Biennial Meeting request advance registration. The advance registration form can be obtained by writing to:

Mr. William Panczner
Program Chairman, MSA-FM
Earth Sciences Department
Arizona-Sonora Desert Museum
Post Office Box 5607
Tuscon, Arizona 85703

ACCURATE LOCALITY DATA IS IMPORTANT

by David E. Jensen

Locality data for minerals, rocks and fossils is important to scientists and collectors alike. The information should be as complete and accurate as possible, especially when reference is made to specific minerals, etc. in the literature. Accuracy is paramount when material is used for research projects.

The need for accurate identification and labeling of minerals was first brought to my attention at Cornell University where I majored in Chemistry. In my senior year, 1929-30, I studied spectroscopy under Dr. Jacob Papish, a brillant chemist and head of a fairly new Spectroscopy Department. It was in his class that he related a very frustrating experience that he had encountered a short time before.

In the 1920's, extensive studies were begun on possible uses for the element germanium which had been little more than a scientific curiousity since its discovery in 1866. A therapeutic use for germanium oxide was reported in 1922. Dr. Papish became interested in locating possible new sources for the element and began spectroscopic examination of sphalerite ores from a variety of world localities. In one example, he discovered strong spectral lines of germanium indicating a high concentration of the element. Immediately, he wrote for more samples, only to find that no germanium was present in the second lot from the locality. After considerable correspondence and further analyses, it was discovered that locality labels on the first shipment had been carelessly mixed in packing.

Eventually, he found that the zinc ore with the high germanium content came from Tsumeb, South-West Africa. Soon afterwards, the rare mineral "germanite" was identified in the ore and Tsumeb mines have continued to be a major world-supplier of the metal. In recent years, a second germanium mineral, "renierite", has been found in the same mines.

Locality names often change over the years due to political changes within a country; or they may vary depending upon the language of the map or atlas in which the information is published. Population exodus from a region may result in the complete disappearance of a town from a map. This is especially true of mining camps that flourish for years and then become abandoned when mining activity ends.

During the last decade, my attention has been focused on mineral locality names appearing on mineral specimen labels exhibited in competition for prizes at mineral shows. With many references available, it is surprising, and often confusing to judges, to find great variations in the spelling of locality names. One example is the locality in Asiatic Turkey that has been a source for the mineral sepiolite (meerschaum) for several centuries.

Sepiolite is a clay mineral that is a member of the palygorskite group. The name, sepiolite, is derived from the Greek word for cuttle fish, the "bone" of which is dry and porous. Meerschaum is from the German word for "sea foam" alluding to its lightness and color. Turkish meerschaum has primarily been used in making pipe bowls, some of which have been beautifully carved in Austria.

A brief literature search a few weeks ago for the correct spelling of the Turkish meerschaum locality brought to light some very interesting information. A check of twenty-seven reference sources turned up the following variations in spelling.

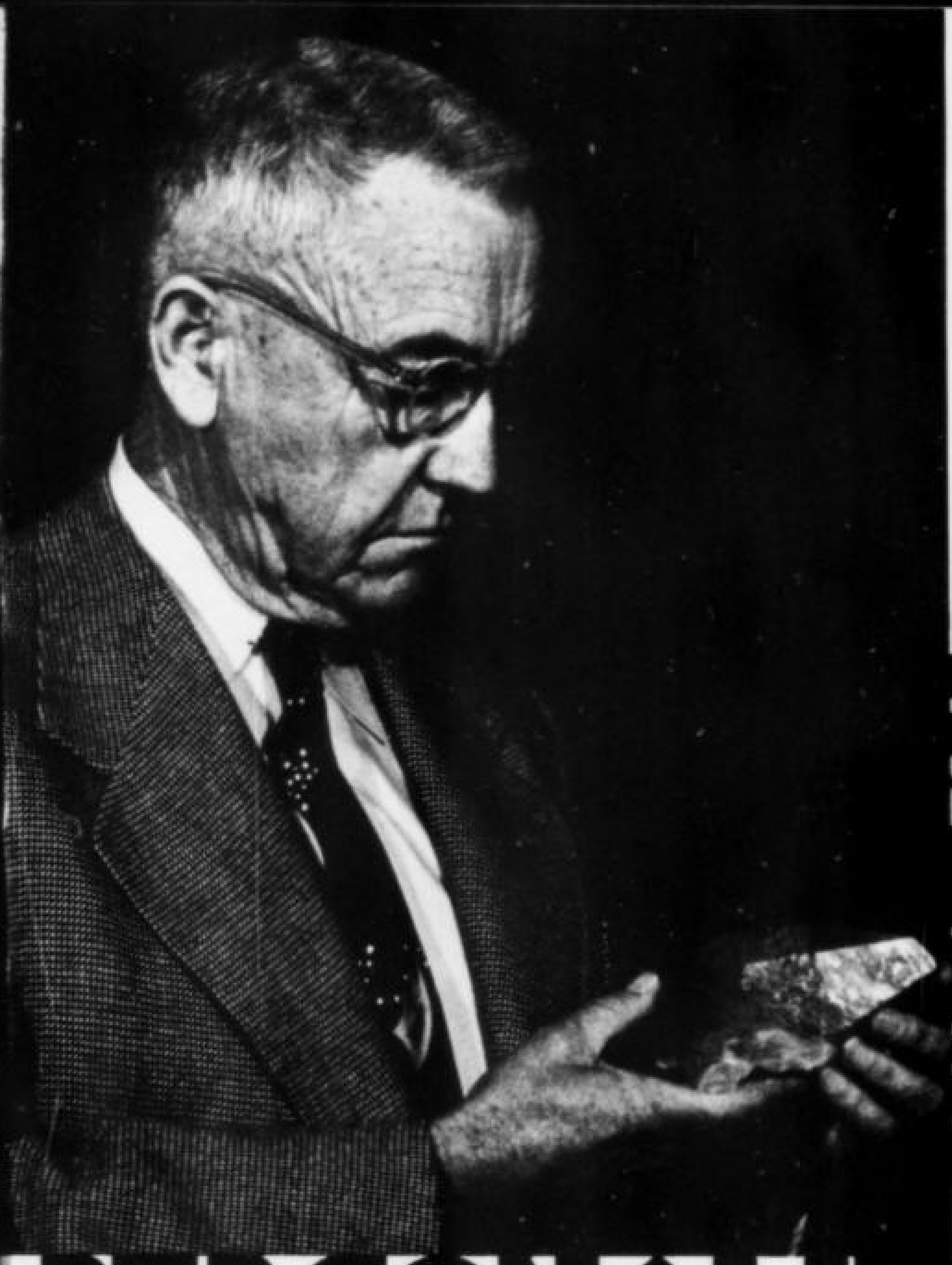
ESKISHEHIR
ESKISCHEHR
ESKIHI-SHER
ESKI-SHEHR
ESEKISCHEHIR
ESKIṢEHIR
ESKIHI SHER
ESKI SHEHR
ESKISCHEHIR
ESKISEHIR
ESKISHEHR
ESKI SCHEHIR

The most recent spelling is Eskisehir. In the official Turkish spelling, there is a diacritical mark beneath the 2nd letter "s". This mark is used in English publications such as the *Times Atlas of the World.*

It is interesting to note that in Turkey, where sepiolite is mined, Eskiṣehir is the name of both the county (province) and its capital; there are thirty-one separate mines in the county. The mines are generally very small and operated by a person or a family.

There is a "light ahead in the tunnel". A committee recently organized by the Friends of Mineralogy has been assigned the task of preparing data for a Directory of Mineral Locality names. This is a major project. It will be worldwide in scope with authorities chosen in different parts of the world to prepare and edit lists of names. The collected information will be carefully edited again before publication.

This article originally appeared in Ward's Geology Newsletter, *No. 45, Fall, 1974, and is reprinted here with the permission of the author. Ed.*



PERSONALITY SKETCH

Magnus Vonsen

1879 - 1954

by George S. Switzer

The name Magnus Vonsen is not a byword amongst today's mineral hobbyists because he was building his mineral collection in a period before the hobby reached the high degree of popularity it now enjoys. Vonsen began studying and collecting minerals in 1918 and by 1940 had the finest private collection in the entire country.

Vonsen was born in Petaluma, California, in 1879. His father was a rancher and Vonsen spent his early years on the home ranch near Petaluma. In 1904 he became part owner in a feed and grain business, and in 1913 he became sole owner of the business and organized the M. Vonsen Company.

Magnus Vonsen became interested in minerals because a World War I demand for chrome, manganese, and mercury stimulated mining activity in the vicinity of his home in northern California. He had received no formal schooling in science and, in fact, his formal schooling did not go beyond the 8th grade. His mineralogy was learned by study at home and through University of California extension courses.

Vonsen had a well-equipped home laboratory and developed great skill in blowpipe analysis and qualitative chemical analysis. His laboratory manual for mineral identification was the classic *Determinative Mineralogy and Blowpipe Analysis* by George J. Brush and Samuel L. Penfield. In later years he purchased a polarizing microscope and taught himself the immersion oil method of mineral identification by their optical properties, a remarkable feat for someone without scientific training and without benefit of a formal course in this difficult subject.

His collection, numbering several thousand specimens of fine quality, was handsomely displayed in museum-type cases in a special room in his home. All of this was accomplished in hard-won leisure time from his very successful feed and grain business.

It is remarkable that Vonsen was able to maintain his keen interest in his hobby in the early years for, during this period, he had no one nearby to communicate with. There were very few collectors, especially in the northern California area where he lived. There were few clubs, no federations, shows, none of the activities that today help to stimulate and maintain one's interest. He did not have the advantages available to collectors in the eastern United States, who were generally members of either the New York Mineralogical Club or the Philadelphia Mineralogical Society.

During the 1920's and 30's Vonsen's principal contacts were with professional mineralogists. In 1920 he discovered near Riverside, California, a new iron magnesium borate that was named vonsenite in his honor by Professor A. S. Eakle of the University of California (Berkeley). In 1934 he discovered another new borate mineral at Borax Lake, Lake County, California, and in 1939 was co-author with W. A. Gale and W. F. Foshag, of a paper describing this new mineral, teepleite. During this period he became a close friend of Foshag, then Curator of Mineralogy at the Smithsonian, and of Professors Charles Palache and Esper S. Larsen, Jr., of Harvard University, Waldemar T. Schaller of the U.S. Geological Survey, Professor Austin F. Rogers of Stanford University, and many others. In 1937 he was elected a Fellow of the Mineralogical Society of America.

Vonsen's collection was especially noteworthy for its borate minerals, for he was particularly interested in this mineral group. He made twice-yearly collecting trips to Death Valley and nearby areas for more than 30 years, and his knowledge of mineral localities in southeastern California and southwestern Nevada was unsurpassed.

The California glaucophane schists also attracted a great deal of Vonsen's attention, for Petaluma lies within the vast area in northern California underlain by the Franciscan formation, with its numerous outcrops of these unusual rocks. Vonsen was the first to discover pumpellyite as a constituent of glaucophane schists. He also first demonstrated that lawsonite is widespread in these rocks in great diversity of form.

It was my good fortune that I grew up in Petaluma just a few houses down the street from Magnus Vonsen. He kindled my interest in mineralogy when I was but 12 years of age. During my high school years I spent countless evenings in his laboratory watching him work and listening to him talk about minerals and tell of his collecting experiences. Other times were spent studying his collection or accompanying him on collecting trips. In later years his constant help, advice, and encouragement proved invaluable to me.

In 1931 Vonsen became a member of the California Academy of Sciences and a few years later was made Honorary Curator of Minerals at the Academy. In 1953 he donated part of his collection to the Academy and saw it installed in the Hall of Science in Golden Gate Park in San Francisco. In his will he provided that the balance of his collection go to the Academy, thus fulfilling his goal that his collection, especially rich in California minerals, should remain intact in his native state, rather than being dispersed, or incorporated into one of the major collections in the eastern United States.

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July 19-20, Colorado Springs, Colo.
September 13-14, Fayetteville, N.C.
September 19-21, Winston-Salem, N.C.
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Shows: Cincinnati, Denver (national).

Levyne - Offretite from Beech Creek, Oregon

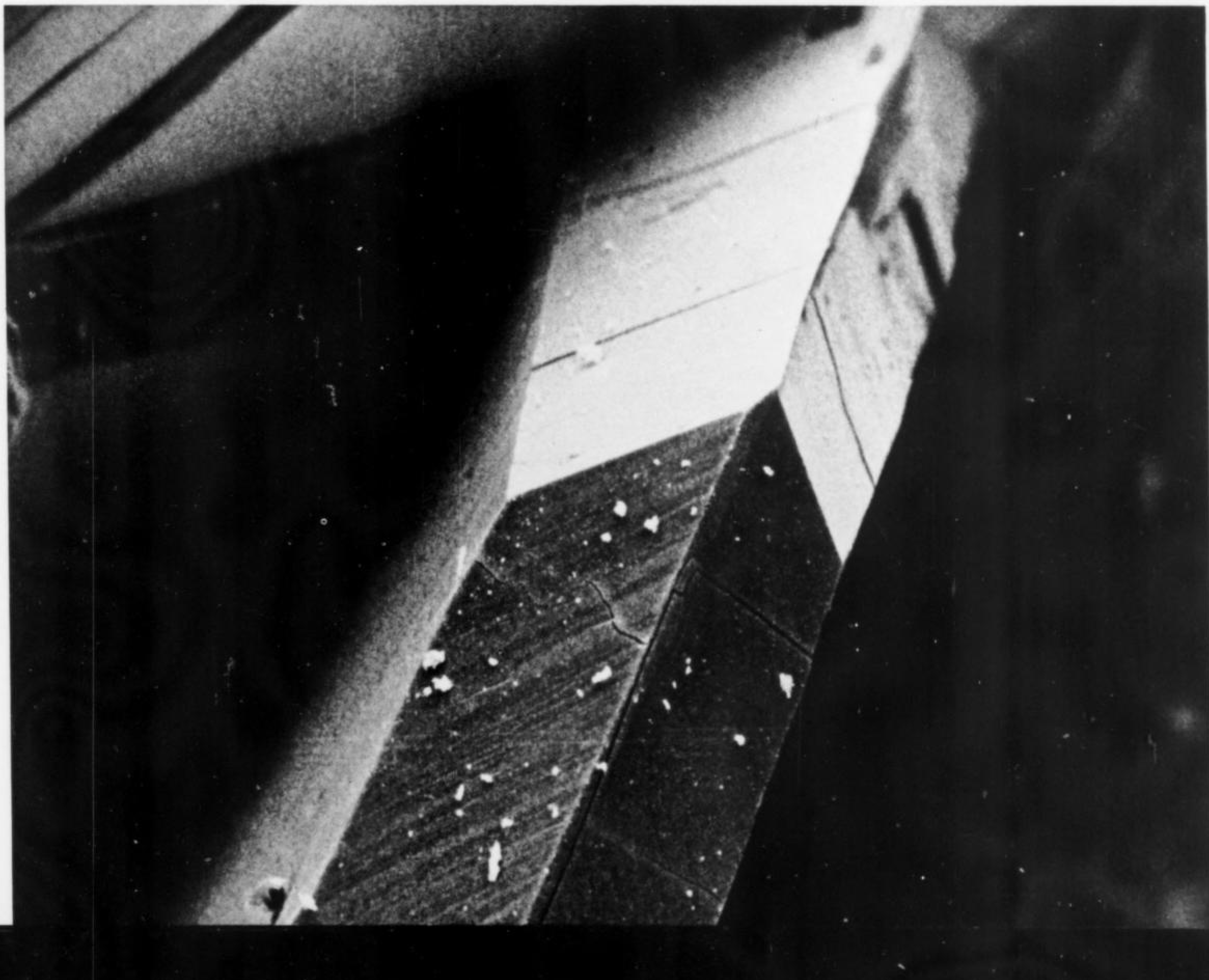
by John S. White, Jr.

Department of Mineral Sciences
National Museum of Natural History
Washington, D.C. 20560

Levyne crystals lining vesicles in a basalt from Oregon have been known to collectors for many years. The locality has been popularly referred to as Beech Creek, Grant County, Oregon. The white crystals are thin platelets in random intergrowths standing up from the surface of the vesicles. They are nearly circular in shape. Some of the crystals approach 1 cm in diameter but the average size is approximately 0.3 cm.

When examined under magnification it is obvious that these are composite crystals consisting of a core of a transparent mineral sandwiched between silky white layers of offretite. The transparent core mineral is levyne and the silky mineral is offretite. It is this composite appearance that led to the x-ray examination of this material and their identification as levyne-offretite intergrowths. For a more

Figure 1. **Complete crystal showing that the offretite layer extends over all of the crystal faces. 220X.**



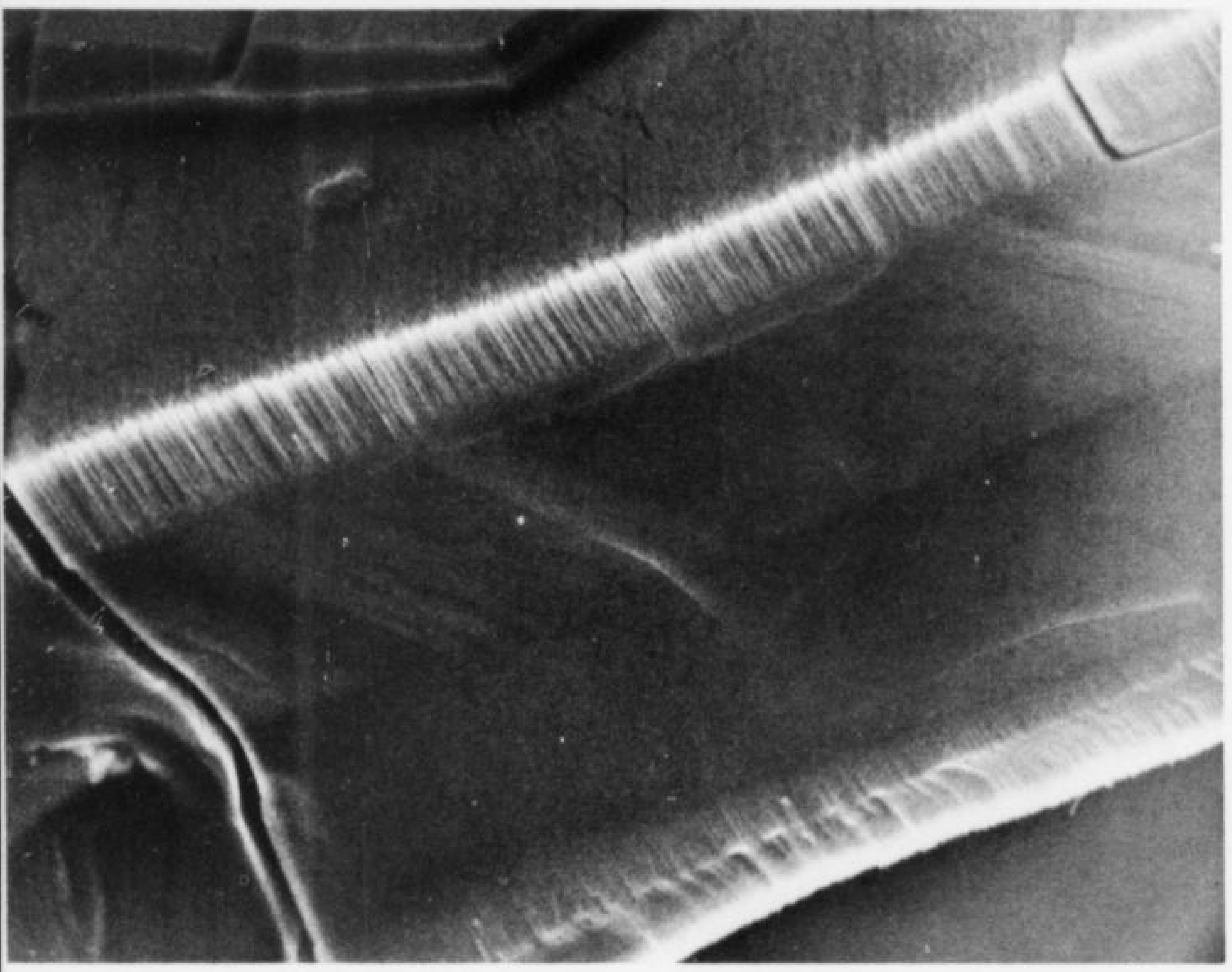


Figure 2. **Levyne-offretite. A view across the surface of a broken crystal. The darker interior is levyne, the fibrous layers on either side are offretite. 400X.**

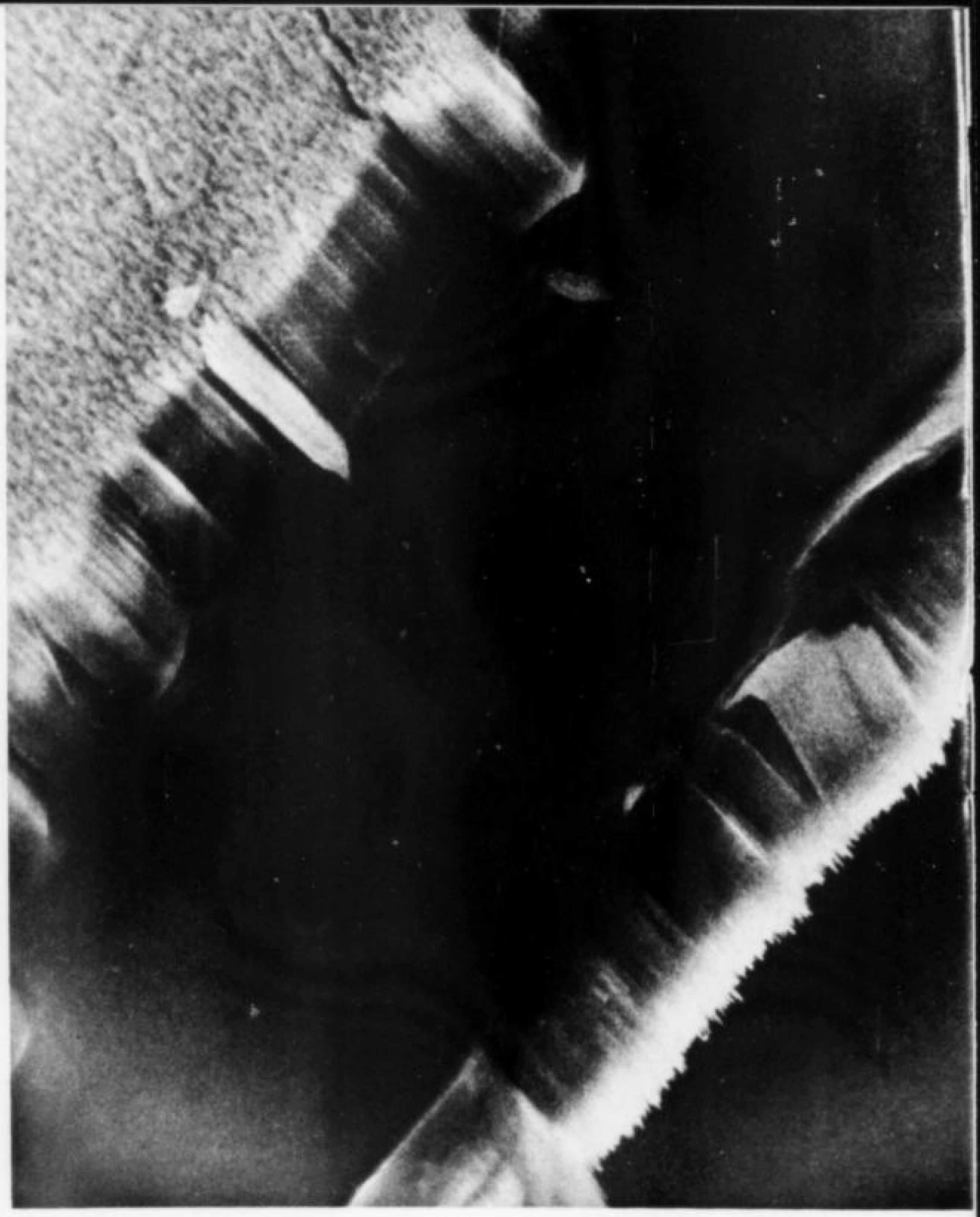
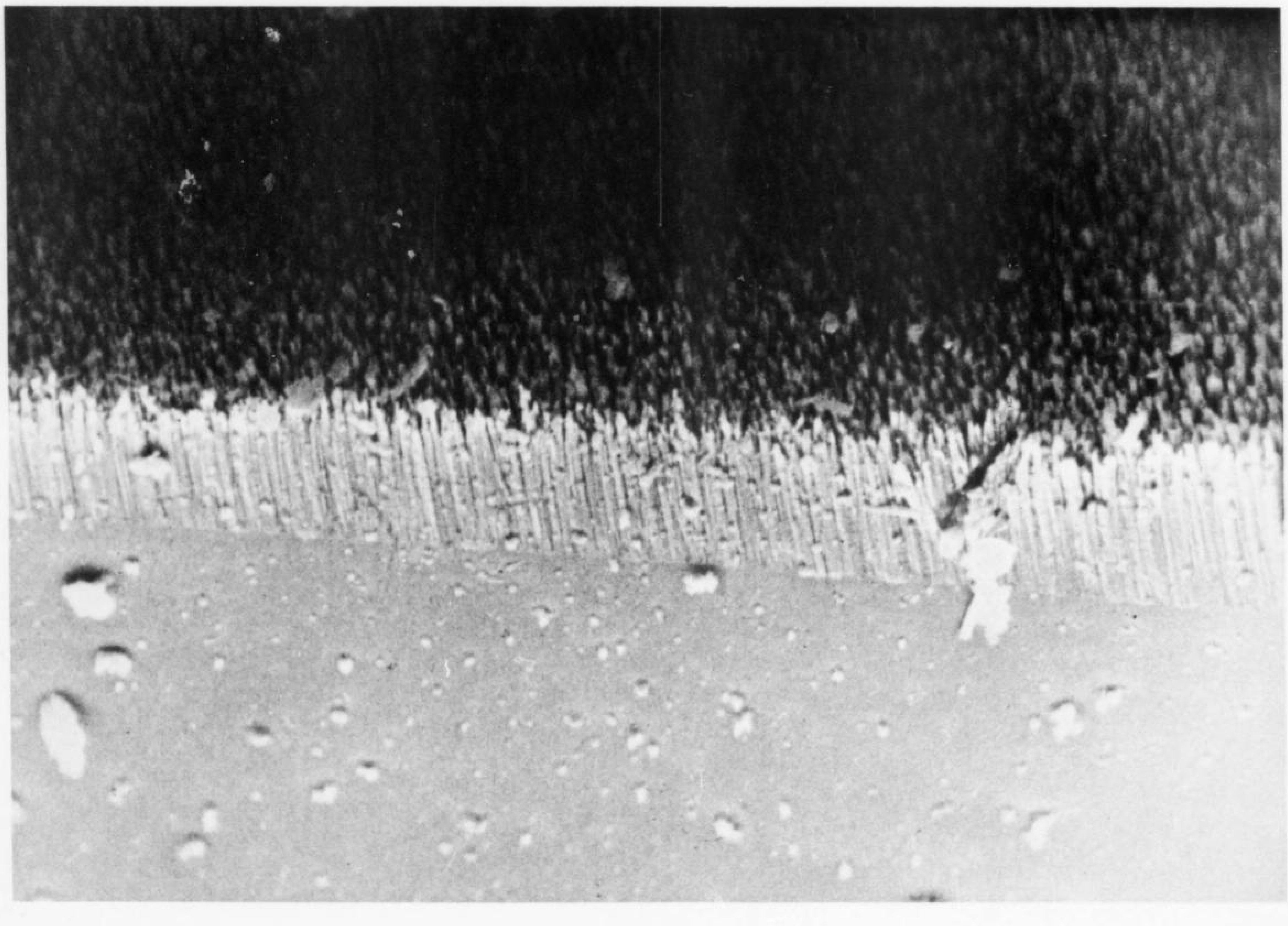


Figure 3. **Levyne-offretite. A view similar to Figure 2. 1,000X.**

Figure 4. **Levyne-offretite. Another view similar to Figure 2. 2,000X.**



technical treatment the reader is referred to a recent paper by Sheppard, *et al* (1974). The primary purpose of this note is to show to the readers the exciting SEM photographs taken at the Smithsonian by Walter Brown, Figures 1 - 6. The specimen in all of the SEM photographs shown here is NMNH specimen #R15766.

In the paper cited above it was stated that chabazite has not been found sharing vesicles with the levyne-offretite intergrowths. A recent communication from Albert McGuinness (letter, 1974) indicates that this conclusion is incorrect. McGuinness states that some examples have been found at Beech Creek of levyne-offretite associated not only with chabazite, but also with phillipsite, analcime and thomsonite, and he provided specimens to support his statement. He further pointed out an error in the locality information as reported in Sheppard, *et al* (1974). The quarry is not 0.2 km east of Beech Creek, but is actually *on* Beech Creek, approximately 0.2 km east of U.S. Highway 395.

The article also precipitated a communication from Rudy W. Tschernich (letter, 1974) in which he states that the list of associated minerals should be much longer. He provided the following list:

levyne - very common
offretite - very common
*chabazite (normal and twinned "phacolite") - very common
*thomsonite - very common
copper - rare
*analcime - very common
*calcite - scarce
*aragonite - scarce
*phillipsite - scarce
*mesolite - scarce
heulandite - rare
stilbite - rare
unknown, possible new species - very rare

* =have been found in association with levyne-offretite

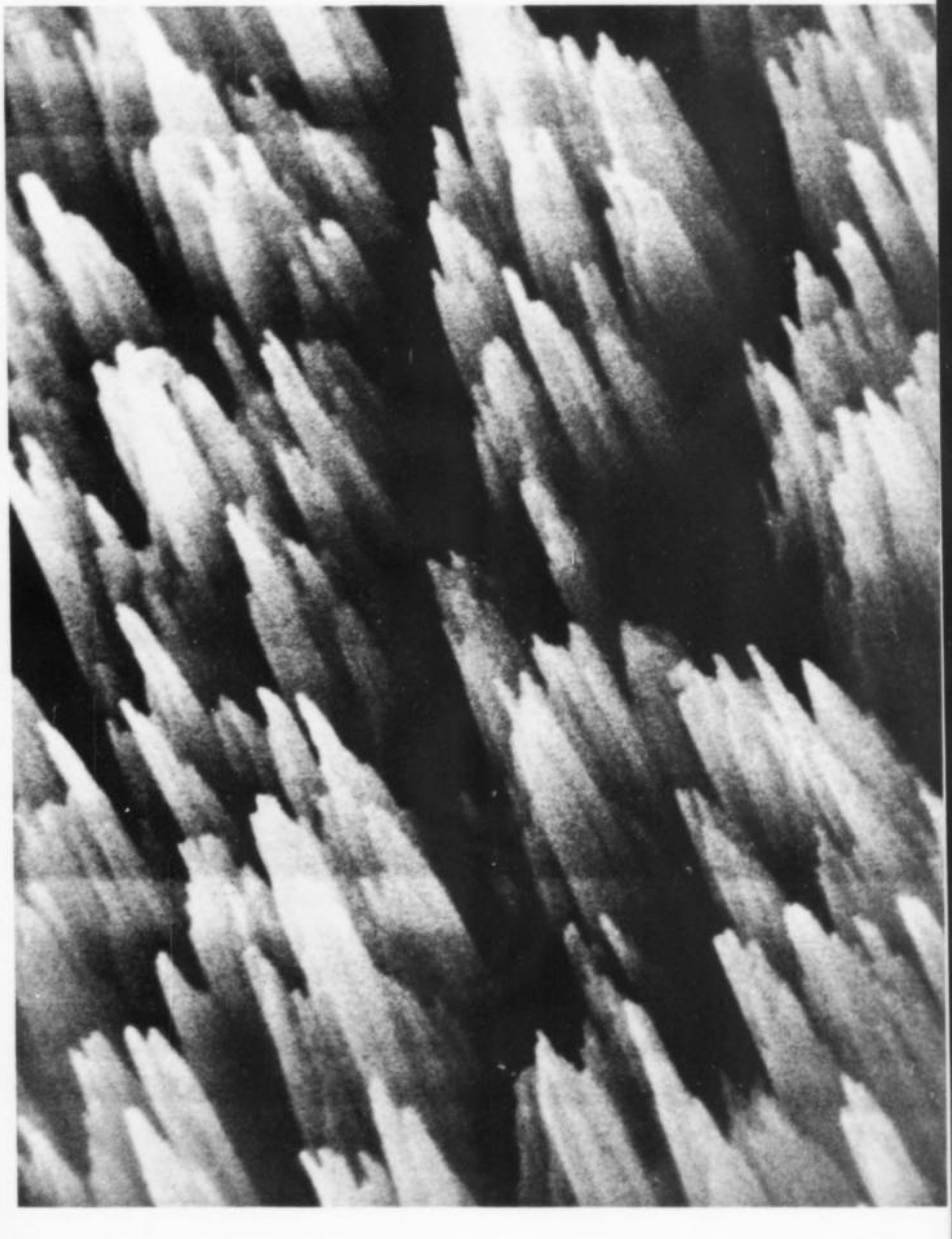
To quote Tschernich, "While the levyne-offretite-bearing vugs are abundant and usually only the two minerals are present... the same can be said of the other zeolites... only one to three are present in any one vug at this location. I have many specimens that have levyne-offretite in association with thomsonite, chabazite, copper, analcime, calcite, aragonite, mesolite, and phillipsite. The idea that levyne forms alone is a myth. About 20% of the levyne is in association. But at this location chabazite is also usually alone... with 20% in association."

REFERENCE

SHEPPARD, R. A., A. J. GUDE, G. A. DESBOROUGH and J. S. WHITE, Jr. (1974). Levyne-offretite intergrowths from basalt near Beech Creek, Grant County, Oregon. *Amer. Min.*, **59**, 837.

***Figure 5.* Offretite needles with levyne at the lower right. 3,000X.**

***Figure 6.* Offretite. The ends of the needles are clearly shown in this photograph. 10,000X.**



FLUOBORITE
A NEW LOCALITY

by Lance E. Kearns **Dept. of Geology, University of Delaware, Newark, Del. 19711**

INTRODUCTION:

The rare mineral fluoborite has been found at the Edison (Bodnar) quarry, Rudetown, New Jersey. Fluoborite is a hydrous magnesium borate with the formula $Mg_3(BO_3)$ - $(F,OH)_3$. Fluoborite was initially discovered at Norberg, Sweden (Geijer, 1926), and later identified and described from the Sterling Hill mine, Sussex County, New Jersey (Bauer and Berman, 1929), and from several other localities (Segnit and Lancucki, 1963).

OCCURRENCE:

The Edison quarry is located in the coarsely crystalline, white Franklin limestone (marble) five and a half miles northeast of the Sterling Hill mine, Ogdensburg, New Jersey. The fluoborite is limited to one small area of the quarry where it occurs as relatively abundant, translucent to transparent crystals in 5 - 10 cm thick bands in the marble. The fluoborite layers alternate with layers of isolated norbergite grains (verified by X-ray powder pattern), and probably chondrodite. Small plates of graphite are equally distributed throughout both layers. Several small reddish-brown spinel octahedrons were also found with the fluoborite.

Two of the previously reported fluoborite associations are: (1) pyrochroite, mooreite, hydrous zinc carbonate (hydrozincite), zincite, willemite, fluorite, and rhodochrosite in hydrothermal veins at the nearby Sterling Hill mine (Bauer and Berman, 1929; Palache, 1935), and (2) calcite, ludwigite, and chondrodite in a contact metasomatic deposit at the Norberg, Sweden, type locality (Palache, *et al.*, 1951). The Rudetown locality is neither contact metasomatic nor hydrothermal.

Reports of the crystal habit of fluoborite have described the mineral as " ... hairlike material in fluffy, loosely felted aggregates filling cavities... " (Palache, 1935), or as " ... acicular hexagonal prisms... sometimes arranged in stellate groups..." (Palache, *et al.*, 1951).

Fluoborite from Rudetown is in slightly rounded, hexagonal prismatic crystals with rough, pyramidal terminations. The largest crystal collected measures 3 mm x 11 mm. One observed, but unobtainable, crystal at the quarry measured 13 mm in cross-section. The average crystal size is about 2 mm x 5 mm. Cleavage is good, {001}.

Fig. 1. **Fluoborite crystal showing rounded hexagonal prism and termination. (35x)**

DENSITY AND OPTICAL PROPERTIES:

The density was determined by heavy liquids using selected clear crystal fragments. The measured density for the Rudetown material is 2.98, which is in perfect agreement for the pure, fluorine end-member of fluoborite as reported by Schaller (1942).

Fluoborite is uniaxial negative with indices increasing with increasing OH:F ratio. The Rudetown material has $\omega = 1.528$ and $\epsilon = 1.501$ (± 0.002; Na filtered light). The optics are not in agreement with Schaller's (1942) projected figures for pure fluorine fluoborite (see table 1).

Table I — Fluoborite - Optical Indices

	*$Mg_3(BO_3)F_3$	Rudetown	**Sterling Hill	*$Mg_3(BO_3)(OH)_3$
ω	1.502	1.528	1.547	1.579
ϵ	1.487	1.501	1.522	1.532

* Schaller, 1942. End members extrapolated.

** Palache, 1935. Fluoborite with zincite at Sterling Hill, N.J. (F:OH = 0.583)

X-RAY CRYSTALLOGRAPHY:

The fluoborite space group, determined by Okazaki, *et al.*, (1965) is C_{6h}^2-$P6_3/m$. The unit cell dimensions are given in table 2.

CHEMISTRY:

A complete quantitative analysis of the samples could not be obtained due to the difficulties of boron analysis. The presence of boron was indicated by emission spectroscopy, but a reliable quantitative measure was unobtainable.

Microprobe analysis (CaF_2 standard) showed 28.9% fluorine, indicating a nearly fluorine-pure end-member (30.2%); magnesium analysis yielded 68.8% MgO (ideal, 64.1%). Traces of manganese and iron were also indicated by the same technique (analyst - Joseph A. Nelen, Smithsonian Institution).

***Fig. 2.* S.E.M. photograph of roughly terminated fluoborite crystal, *Photograph by John W. Sherman.* (100x)**

Table II — Cell Constants

	a	c	%Fluorine	Specimen origin
1.	9.06 Å	3.06 Å	9.30	Tallgruvan, Sweden
2.	8.924 Å	3.115 Å	14.8	Crestmore, California
3.	8.83 Å	3.10 Å	28.9	Rudetown, New Jersey
4.	8.82 Å	3.10 Å	30.2	Nocera, Italy
5.	8.805 Å	3.10 Å	30.2	Synthetic

1. Takéuchi, 1950.
2. Segnit and Lancucki, 1963.
3. This paper
4. Brisi and Eitel, 1957.
5. Okazaki, et al., 1965.

A plot of cell constants vs. composition (Segnit and Lancucki, 1963) shows an increase in the *a* dimension with increased OH:F ratio. X-ray powder pattern data for the Rudetown fluoborite (28.9% F) is in closest agreement with Okazaki, *et al.* (1965), and Brisi and Eitel, (1957).

FLUORESCENCE:

The Rudetown fluoborite exhibits a strong cream-colored fluorescence in shortwave ultraviolet radiation. The longwave UV evokes no response, and there is no observed phosphorescence. Prior to this find fluoborite has not been reported as a naturally occurring fluorescent mineral.

Okazaki et al. (1965), were able to synthesize three fluorine bearing magnesium borates, and to determine three different structures, $3MgO \bullet B_2O_3 \bullet 0.5MgF_2$, $3MgO \bullet B_2O_3 \bullet MgF_2$, and $3MgO \bullet B_2O_3 \bullet 3MgF_2$, which were named $\propto$, β, and γ respectively. The alpha-type had no fluorescence; the beta-type (warwickite structure with MgF_2 replacing Ti-O) fluoresced pale blue-white under 253.7 μm ultraviolet light when the sample was at the temperature of liquid nitrogen; the gamma-type (fluoborite) fluoresced yellow-green when heated in the presence of fluorine vapor. The fluorescent beta and gamma crystals were activated with titanium; the different fluorescent responses are attributed to $Ti\text{-}O_6$ bonds which produce the blue-white fluorescence and the $Ti\text{-}F_6$ bonds which produce the yellow-green fluorescence. The fluoborite from Rudetown shows no trace of titanium and the fluorescent activator is unknown.

ACKNOWLEDGEMENTS:

The author gratefully acknowledges the guidance of P. B. Leavens in the preparation of this article. Further appreciation is extended to Frederick Bopp III, and John Sherman, for their generous technical assistance, to Joseph A. Nelen for the microprobe data, and to Takako Nagase for the translation of the Okazaki, et al., paper.

REFERENCES:

BAUER, L. H. and H. BERMAN (1929). Mooreite, a new mineral, and fluoborite from Sterling Hill, N. J., *Am. Min.* **14**, 165-172.

BRISI, C. and W. EITEL (1957). Identity of nocerite and fluoborite, *Am. Min.* **42**, 288-293.

GEIJER, P. (1926). Norbergite and fluoborite, two new minerals from the Norberg mining district, *Geol. Foren. i Stockholm Förhandl.*, **48**, 84-85.

OKAZAKI, H., S. NAKAZIMA, H. MIZUNO (1965). The crystal structure and the character of fluorescence in fluorescent $MgO\text{-}B_2O_3MgF_2$ bodies, Nippon Kagaku Zasshi, *Jour. Chem. Soc. Japan*, **86**, 1015-1018.

PALACHE, C. (1935). The minerals of Franklin and Sterling Hill, Sussex county, New Jersey, *U. S. G. S. Prof. Paper* **180**, 127-128.

PALACHE, D., H. BERMAN, C. FRONDEL (1951). *Dana's System of Mineralogy,* v. II (7th ed.); John Wiley & Sons, Inc., New York, 369-370.

SCHALLER, W. T., (1942). The identity of ascharite, camsellite, and β - ascharite with szaibelyite; and some relations of the magnesium borate minerals, *Am. Min.* **27**, 483-485.

SEGNIT, E. R. and C. J. LANCUCKI (1963). Fluoborite from Crestmore, California, *Am. Min.* **48**, 678-683.

TAKÉUCHI, Y. (1950). The structure of fluoborite, *Acta Crystall*, **3**, 208-210.

ED OVER AT THE RED CLOUD

The story of one man's discovery

*by Terry Szenics**

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Some of the finest mineral specimens ever found in North America have come from a small mine in desolate southwestern Arizona. Named for a nearby trail used by Spanish explorers, the Red Cloud mine strikes a resonant chord in every collector's heart for the gorgeous red wulfenite found there in years past. For a mineral that already comes beautifully crystallized from dozens of other localities there is stiff competition; yet in perfection of form, color, and pure esthetic appeal, most collectors agree that Red Cloud wulfenite has no equal.

In the scientific and commercial history of mineralogy during the past century, few people have reached the stature to be considered great. The science owes much to men like George L. English, A. E. Foote, and Henry Ward. These individuals actively worked to bring forth rare and beautiful mineral specimens from the depths of the earth to the collecting public. This story is of just such a man, the late Edwin J. Over, Jr., and what may be his greatest contribution, the discovery of the finest specimens of Red Cloud wulfenite ever found. The facts regarding his find are few indeed, and little has been published on it. With this article we hope to fill the gap.

The team of Arthur Montgomery and Edwin Over is well known in mineral circles for the discoveries they made in the western U. S. in the 1930's. Their finds include the finest aquamarine and phenakite from Mt. Antero, Colorado, topazes; and their most publicized effort, the mining of variscite nodules at Fairfield, Utah (the type locality for what are now known as montgomeryite and overite).

It was Dr. Charles Palache, then of the Department of Mineralogy of Harvard University, who first brought Montgomery and Over together in 1934. They had both previously collected at the Thomas Range topaz locality in separate efforts, and a strong friendship developed immediately. At that time Over made his home in Woodland Park, Colorado, but he was born in Spokane, Washington, and raised in Kansas and Oklahoma. As a young man with a love for minerals and mining he was drawn to Colorado. Following a near decade of partnership with Montgomery, Over spent more and more time collecting in the Colorado pegmatite area until his death in 1963. Arthur Montgomery went on to earn his Doctorate in Mineralogy, and has been for many years associated with the Department of Geology, Lafayette College, Easton, Pennsylvania.

We would like to thank Dr. Montgomery for his time and help in putting this story together. He was kind enough to grant a taped interview and to permit access to Ed Over's correspondence on the Red Cloud mind.

The Montgomery-Over team succeeded so well not only because they encountered enviable opportunities to collect fine mineral specimens, but also through a mutual respect for each other's abilities in handling specific tasks.

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*As edited for publication in the *Mineralogical Record* by Wendell E. Wilson

This division of labor left Over to collect freely during summers in high-altitude Colorado and Utah, and in winters to head for New Mexico or Arizona, while Montgomery would market his finds in the East. When weather and time permitted they would work specific locations together.

It was during Montgomery's visits to eastern American museums that he noted some superb specimens of Red Cloud wulfenite. These, of course, were found during the first large-scale mining operations in the upper levels of the Red Cloud, and were distributed soon after by famous dealers such as Ward and Foote. One specimen in particular is still on exhibit today at the American Museum of Natural History in New York. There, in the Morgan Hall of Gems and Minerals, is a group of large, superb, orange-red wulfenite crystals on a small piece of weathered, dark matrix, looking like so many oversized red razor blades flaring off a dirty pin-cushion. Montgomery contemplated the possibility of finding more, and wrote to Over, asking him to check into the place. It seemed a worthy gamble; a glorious past does not preclude a glorious future. Ed agreed, and with a number of other projects he had in mind, planned a trip to the Arizona-New Mexico area in the winter of 1937-38.

Ed Over's comments on the Yuma, Arizona, area bear retelling here. The following excerpts are from a letter dated January, 1938.

"After getting your letter Monday I headed for the Red Cloud. Took my time, got there in 56 miles and 4 hours. Could cut time to about 3½ or a little less now that I know the 'road' (courtesy title). Spent the afternoon there, one old watchman and two prospectors live there. Prospectors have some of the other properties and I can do business with them. Evidently there are two to four chances for wulfenite in the area. Got into the Red Cloud but didn't have time for a thorough examination. I think chances there are excellent. That I can produce lovely little matrix specimens and beautiful little clusters of loose crystals I am certain."

It should be noted that Over always made a point of securing permission from the mine owner before venturing underground; the Red Cloud was no exception. He goes on to describe the mine, and mentions that the "best stuff" would be found in stopes where work can be carried forward, and not in the old pillars where others collected before him. This ability to judge wallrock carefullyand not blindly follow the lead of others was one of his great talents. The letter continues:

"In any event, plan to go to Red Cloud Saturday and stay there for a week or ten days. Will take in some water and lots of grub. Will leave most of equipment at hotel. The reason: left Red Cloud 5 PM Monday, got stuck in a wash one mile below. Worked till dark, then hiked back and spent night there. They helped me out next morning. Got stuck 18 miles further on, worked 5 hours to get out. Got back here Tuesday at 5:30 PM. Am two-thirds dead today.

Am going to take the boys a good big bottle of firewater; they sure treated me fine. Will write before leaving. Hope to get moved into another hotel, lighten load, and run out to Castle Dome tomorrow and next day, and then back to the Red Cloud.

Have learned a lot lately. Red Cloud is in beautiful and terribly desolate area. There is no Castle Dome landing as map shows. Things sure look better in all ways promising here."

While it may strike us as humorous or even reminiscent of our own experiences as collectors, we should remember that Ed Over's trials on the Red Cloud took place at a time when four-wheel drive vehicles didn't exist for a depression-stricken public. Ed relied on a Chevy coupe for transportation, and his mining gear was composed of a portable blacksmith outfit with hand steel. No sophisticated machinery such as gas drills was available then. Holes were drilled the hard way, by hand.

In a later letter dated January 22, 1938, Over mentioned meeting a "new outfit", a group of miners with a foreman no doubt, who planned on working the Red Cloud mine for ore "within a month's time". They said he could collect all he wanted, and he was interested in further opportunities in any new areas these men might open up. But he tempered his enthusiasm with the reasoning that they would be slow in starting, or would work in a "wrong" (for wulfenite) area. In this second letter he also mentioned meeting "the fellow who shipped wulfenites to Ward's and Foote's about 1910". What idle conversation passed between Over and this man in the shade of the mine shack can only be imagined, but it undoubtedly could have filled a book!

For almost a month Montgomery received no message from Over. He began to worry, as this was not Over's style. Usually a week did not go by without some word. What Montgomery didn't know was that Over was in the middle of making a great discovery.

Though he was allowed to collect unmolested, Over probably felt a little anxious with miners coming and going at will, especially if he happened to find something valuable. "Sharing" a mine, where he could do his own drilling and blasting, is hard to imagine today. At any rate, the Red Cloud miners more or less put up with him. Surely they thought he must have been a little crazy going for those seemingly worthless crystals they saw from time to time. Maybe they thought he might stumble upon a rich ore pocket while looking for crystals. Or, if he found anything looking valuable, they could very well confiscate it all and be within their rights. One mustn't forget that a miner is an opportunist of the first water.

The third and final letter Over mailed from Yuma, dated February 14, 1938, is one dreams are made of. It could well be the pinnacle of every mineral collector's hopes, like mental images that flash through a child's mind on Christmas Eve. Highlights from this letter follow in Over's typically abrupt style.

"Red Cloud, Yuma, Arizona.

Dear Art: Am going to town tomorrow for mail, supplies, and to ship specimens via Model T. Am sure anxious to hear from you, and my last news from New York was dated the 23rd.

Was sick Thurs., Fri., and Sat., terrible cold, etc. Got back to work on the 6th, on the 7th got into a brecciated area that produced fair stuff, especially one little cluster of transparent, reddish-brown crystals. On the 9th I tried another brecciated seam that has pocketed three times; have raised about 7 feet so far, last pocket is not quite finished, each pocket has been bigger and better, have an estimated 12 to 15 feet that I can raise before being cut off by old workings. Am shipping 8 boxes, 6½ are from this place. I can't compare this stuff with anything I've seen before, in fact the only Red Cloud specimens I can recall are the ones Pohndorf (Famous Denver dealer - Ed.) had. But I will say that these single crystals, clusters and groups are the finest wulfenites I've ever seen, and the most beautiful stuff I've ever taken out.

Am sorry there are not more groups but without going into details, will say the pocket bottoms are covered with loose crystals, and groups are just pure luck. I think this seam is one in a million, when I get it worked out I'm calling it quits. Conditions for working are terrible, and there are various factors that make me think I should finish here about the first or soon after. My time is too valuable for chores right now.

P.S. Note large rose-shaped cluster of crystals especially. Regards, Ed."

Later, when Over and Montgomery finally got together again, a few more details came to light. During the course of exploratory work, Over saw a small seam lined with scatterings of little wulfenite crystals. Taking this as a promising sign, he started to work on this natural fracture zone with the hope that it just might "pocket out" or open into a mineralized cavity. After drilling and blasting for several feet, the seam began to widen into a pocket. He set off a final blast and once the smoke cleared he carefully pried away the jagged, weathered, stained quartz rock from the ever-widening seam. It finally opened into a cavity about 8 inches wide. With the light of his carbide lamp he peered into the opening and let out a gasp. Lying on the soft, earthy oxidized material of the pocket floor were a number of loose wulfenite crystals and crystal clusters of incredible size and beauty. There was nothing adhering to the pocket walls; evidently they had all broken loose naturally, or from the shock of the dynamite blasts. We can only imagine the thoughts and feelings Over experienced as he reached in and gently lifted up each specimen, but what a fantastic thrill it must have been!

Realizing he had a treasure on his hands, he scrounged around and found several empty dynamite crates. These he filled with specimens, each ever so carefully wrapped. Over had mineral care down to a science, and to this day the best and most delicate of these specimens is preserved without a scratch.

By placing the best wrapped specimens on the bottom and poor quality specimens on the top, he was able to carry the crates past the curious miners without causing much of a stir. On the surface he happily unwrapped a few of the inferior specimens and showed off the "priceless treasures" to the bemused miners.

It wasn't long after that Montgomery received a shipment of crates in New York. The Model T was faster than regular mail freight, and so Over's latest letter describing the great find had not yet arrived; these boxes were a surprise. Without knowing what was in store, Montgomery began unwrapping a specimen. It seemed strange that the box apparently contained mostly tissue wrapping paper. As he cautiously and curiously peeled off each layer of paper, the ball of tissue became smaller and smaller, until finally, from beneath the last layer appeared an exquisite, sparkling red object. With a shout of disbelief, he hurriedly unwrapped the remaining boxes. They all contained some of the finest wulfenite specimens in existence! He noted they were better than anything he had seen in any museum.

Possessing a freshness of color seen in few mineral species, these crystals ranged in size to over two inches on an edge, and totalled about two dozen specimens. The best of this triple-pocket soon went to leading museums and collectors. The finest matrix specimen is a mushroom-shaped 2½ -inch grouping of crystals with a "stem" of black, weathered matrix several inches high. Though by no means the largest known wulfenite crystals, this specimen is believed by many to be the finest esthetic example of this mineral. A 2 x 1-1/4 inch single crystal resides with this piece in Harvard's Mineralogical Museum, and Richard Bideaux possesses an even larger crystal which is about 2 inches square.

For his own private collection, Montgomery kept a few of the finest Red Cloud specimens which are now on display in the Edwin Over memorial case in the Mineral Hall of the Smithsonian Institution. Over kept for himself one of the largest and most perfect loose crystals which also went to the Smithsonian after his death. After several years, part of the lot, augmented by another shipment of lesser quality Red Cloud wulfenites, went to the famous Schortmann brothers of Easthampton, Massachusetts, who ran a great mineral specimen business for nearly 30 years. In 1940 they took over all of the Over-Montgomery minerals when the collecting partnership ended. For many years the Schortmanns were bothered by more and more collectors wanting a choice Over-Montgomery Red Cloud wulfenite. A large portion of the material mined by Over and Montgomery passed through Schortmann's showcases, and many collectors today fondly recall those "great days" when the Schortmanns held their annual sales; their tables were all aglow with items we rarely or never see nowadays.

Today the wulfenite specimens from Ed Over's find, and the best of the "old" Red Cloud material are rarely offered for sale on the mineral market. While each year brings a new crop of suddenly aware and advanced collectors, more Red Cloud wulfenite specimens like those Ed Over found have failed to appear equal to the demand. Like other classic specimens, an Ed Over wulfenite can sometimes be acquired through the disbursement of an old collection. The possibility of finding a Red Cloud "sleeper" at some show is also unlikely. It is a matter of "channels". This type of material, when freshly mined, automatically goes to advanced collectors, and circulates in that echelon as generations pass. Any knowledgeable dealer chancing upon a fine Red Cloud wulfenite will have a dozen eager buyers already lined up. Naturally the highest-paying collector receives, and so the specimen lives up to its classic status in price as well.

Throughout his collecting career, Ed Over was a tight-lipped individual, and so to this day nobody seems to know exactly *where* in the Red Cloud mine Over made his discovery. There was not enough information in his notes or correspondence to pinpoint the spot; from his scanty underground descriptions it could have been anywhere in the mine. This writer has heard many people tell the "exact location," straight from "Over's lips" in fact! They range from moderately plausible to completely absurd, from "just inside the entrance" to the "very bottom of the mine." It is quite possible that the discovery area was obliterated by later mining, or buried by back-filling. We will probably never know for sure.

KODAK RESEARCH LAB MAN ELECTED FELLOW OF MINERALOGICAL SOCIETY OF AMERICA

ROCHESTER, N.Y.-William W. Pinch, of 82 Kensington Court, Greece, N.Y., has been elected a fellow of the Mineralogical Society of America.

Pinch, a member of the Solid State Laboratory of Eastman Kodak Company's Research Laboratories and an accomplished amateur mineralogist, was notified of the rare honor recently by the society.

His mineral collection, located in his home, is officially known as the Pinch Mineralogical Museum and is reputed to be one of the finest private collections in the world. He began collecting as a child some 27 years ago and now has more than 11,000 specimens. He has about 1,300 of the 2,400 known mineral species. His ability to recognize minerals has resulted in his discovering six new minerals—one of them, Pinchite, named in his honor. There are only 40 to 50 new minerals reported each year.

Pinch's work at Kodak relates to his mineralogical pursuits. He makes x-ray identification of crystal samples grown for Kodak research studies. He also develops techniques for polishing crystals. Many are new compounds that no one else has worked with before.

Pinch is a native of Rochester, N.Y. He attended the University of New Mexico.

William W. Pinch, 82 Kensington Court, Greece, N. Y., seen examining quartz crystals in the Pinch Mineralogical Museum located in his home. Pinch, who is recognized nationally for his mineralogical achievements, was recently elected a fellow of the Mineralogical Society of America.

CHROMIAN ALUMOHYDROCALCITE FROM CALIFORNIA, AND KNIPOVICHITE DISCREDITED

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In 1965, several serpentine-Franciscan shale contact zones in the east Mount Hamilton area, Santa Clara County, California, were examined for their mineralogical content. Nickeliferous serpentine was noted in one of these contacts and a more detailed examination was undertaken. Specimens from this occurrence were examined and found to contain a pink radiating mineral, subsequently identified as chromian alumohydrocalcite, coating the fracture surfaces of the nickeliferous serpentine veins.

The zone containing the chromian alumohydrocalcite at the Mount Hamilton locality occurs on the contact between a serpentine body and a dark, partially silicified shale. The serpentine is highly weathered and only loose granular material with occasional residual dolomite veins remains. The serpentine also shows the effects of localized hydrothermal alteration in bands that closely follow the dolomite veins. This alteration has produced discontinuous nickel-rich serpentine bodies which are quite limited in extent with a maximum dimension of only a few feet, encased in a brown clay. The dolomite forms thinly spaced parallel veinlets that show local folding and intense fracturing. These veins have acted as channelways for low temperature hydrothermal solutions which have reacted with the dolomite to form alumohydrocalcite. The hydrothermal solutions were enriched in aluminum and chromium, and related to local low temperature springs. The primary source of the aluminum has been clay minerals derived from the arkosic sandstones in the immediate area. The chromium was probably derived from the weathering of chromite in one of the nearby serpentine bodies or possibly from the decomposition of secondary chrome-bearing silicates. Chromite has been noted as rare grains (0.1mm) in the dolomite but does not occur in sufficient quantity to account for the chromium level found in the alumohydrocalcite.

A spectrographic analysis was performed on a small fraction of material separated from the vein that was macroscopically free of silica, dolomite, and serpentine. The only major elements detected were Al, Ca, and Cr at levels greater than 1% with only minor amounts of Mg, Si, Fe, Cu, Ni, and Mn in the 0.01% range. Further chemical tests indicated that the mineral is a hydrous Ca-Al carbonate with chrome and has physical and chemical properties similar to the minerals alumohydrocalcite and knipovichite. The latter mineral, described by Nefedov in 1953, from the Ak-Su River, Turinskya, A.S.S.R., U.S.S.R., is stated to occur as pink fibrous radial aggregates in dolomite and quartz veins and contains substantial Cr_2O_3 (8.8%), as reported in the analysis. The data provided by Nefedov were not sufficient to characterize this material as a valid mineral species. Since Nefedov's original description, no additional data have been published on knipovichite.

Work on the California mineral was delayed until a sample of the "type" knipovichite could be obtained. This was generously supplied by Dr. M. Dorfman of the Mineralogical Museum, Moscow, in response to our request.

X-ray diffraction patterns of the California mineral and of knipovichite were obtained using Ni-filtered Cu Kα radiation. Since no powder data were given in the abstract of the original description of knipovichite (*Min. Abs.* **12**, 352, 1954), it was necessary to make a direct comparison of the two powder patterns. Several of the strong lines of quartz were superimposed but these were readily identified. A comparison of the two patterns suggests that knipovichite and the Mount Hamilton mineral are identical. A search of the literature for existing hydrous calcium aluminum carbonates was made, and similarities of data were noted between alumohydrocalcite and knipovichite. A comparison of recently published x-ray data for alumohydrocalcite (Kautz, 1968), JCPDS Card 21-127, confirmed the suspicion that alumohydrocalcite and knipovichite most likely have identical structures.

***Fig. 1.* Spheroidal groups of chromian alumohydrocalcite, 1 mm in diameter, showing radiating structure.**

The Mount Hamilton mineral was analysed using standard methods. The CO_2 and H_2O contents were determined using a Leco carbon analyzer and a CEC moisture analyzer, respectively. The major cations were determined by spectrographic methods using standard compositions of oxides on a CEC direct reading spectrograph. The formula derived from the chemical analysis of the Mount Hamilton mineral (Table 1.), using the formula for alumohydrocalcite as a model, is $Ca(Al_{1.45}Cr_{0.55})_2(CO_3)_2(OH)_4 \bullet 3H_2O$. A recalculation of Nefedov's analysis using the same comparison gives $Ca(Al_{1.57}Cr_{0.43})_2(CO_3)_2(OH)_4 \bullet 3H_2O$, showing that both the California and Russian minerals are merely chromian varieties of alumohydrocalcite, in which the trivalent aluminum position has been partially substituted by chromium (III).

Chromian alumohydrocalcite occurs as isolated spheroidal groups and earthy coatings with a light pink to lilac color (Fig. 1). The spheroidal groups range in size from 0.1 to 1 mm and show a radiating structure. Voids at the core of the spheroids are rare and, when found, are lined with minute, sharp glassy crystals. These crystals range in size from 5 to 12 microns in length by 1 to 3 microns wide and appear to show the form of a simple monoclinic prism without modifying faces (Figs. 2a, 2b). Although the symmetry of alumohydrocalcite appears, by its optical properties, to be monoclinic, Kautz (1969) presents data from electron diffraction studies that suggest a triclinic symmetry.

The mineral is pale brownish-pink under the microscope. Grains of dolomite occur in preferential orientation along the radial growth lines. The luster of the spheroidal aggregates is earthy, however the clear crystals appear to have a vitreous luster under the microscope.

The specific gravity was determined on 250 mg of material which was visibly free of dolomite inclusions when examined at 100X magnification. A Berman torsion balance was used with toluene as the immersion liquid. An average value of 2.230 (10) was obtained which agrees well with that of Nefedov (1953) of 2.229 and that reported by Bilibin in Palache *et al* (1951) of 2.231. The Mohs hardness of the aggregates was found to be between 2 and 3. The crystals are brittle and possess one good cleavage parallel to the elongation, and a second less perfect cleavage perpendicular to the first. The minute size and fibrous nature of the individual grains precluded any exact measurement of the optical properties, although indices ranging from 1.50 to 1.58 were obtained and a moderate 2V was noted.

The rare mineral alumohydrocalcite, $Ca\ Al_2(CO_3)_2(OH)_4 \bullet 3H_2O$, was first described by Bilibin in 1926 (Palache, *et al.*, 1951) from the Khakassy district, Siberia. Its mode of formation is related to the action of carbonated waters

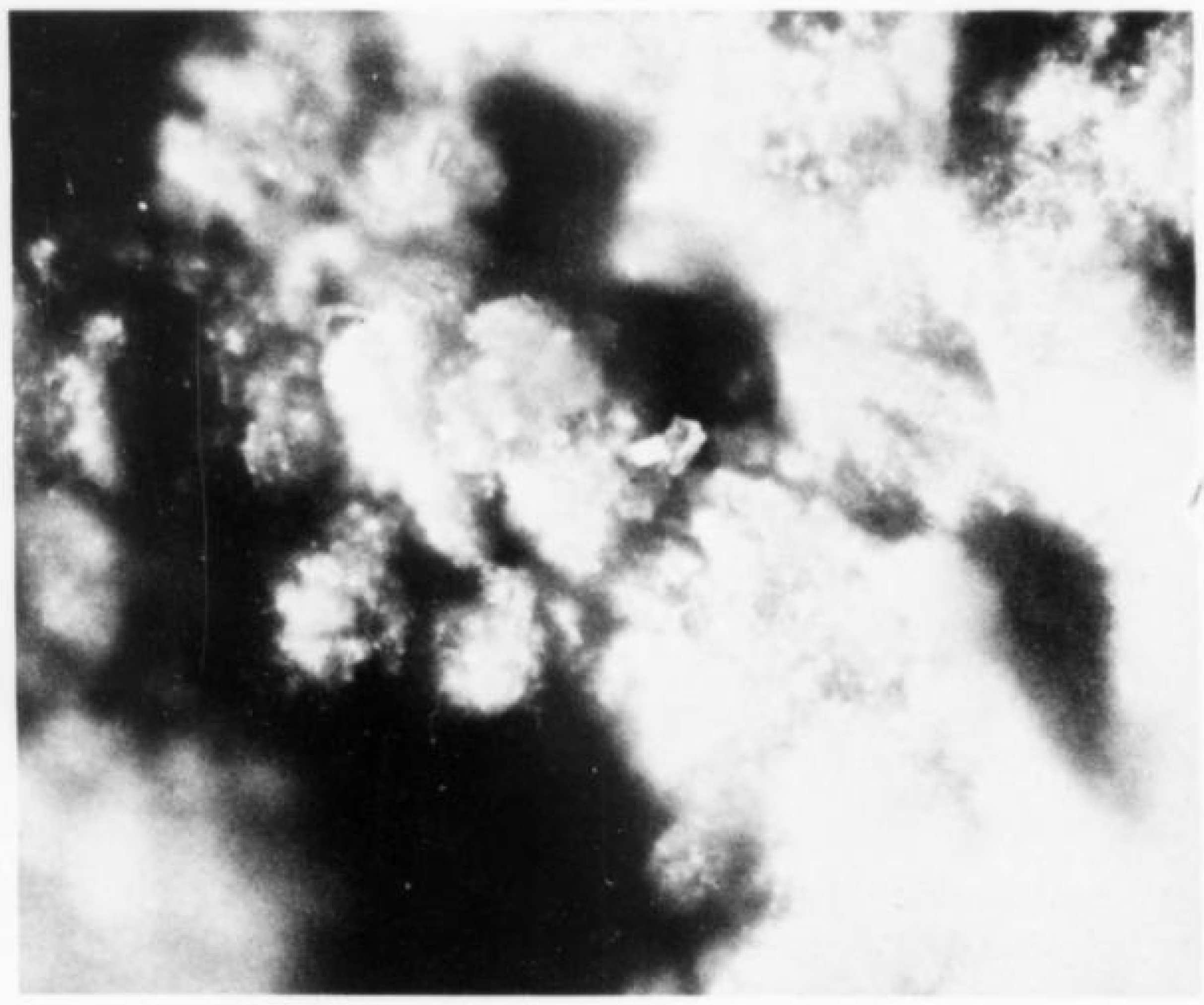
Table 1. CHEMICAL ANALYSES OF ALUMOHYDROCALCITE

Constituent	Weight per cent				
	This study	Nefedov[1] (1953)	Nefedov[2] (1953)	Kautz (1968)	Bilibine (1926)
CaO	16.5	15.00	16.5	17.8	15.46
Al_2O_3	22.0	21.8	24.1	31.3	28.60
Fe_2O_3					0.45
Cr_2O_3	8.3	8.8	9.7		
CO_2	26.4	} 45.	49.7	24.2	25.20
H_2O^+	26.6			26.7	26.40
H_2O^-					2.48
Insol.		2.9			1.76
Total	99.8	93.5	100.0	100.0	100.35

[1] As reported

[2] Recalculated to 100%

Fig. 2a. **Left, minute crystals of chromian alumohydrocalcite, 12 microns in length, lining cavity of spheroid.** ***Fig. 2b.*** **Right, enlargement of 2a (6x) showing three short crystals with a common growth origin.**



on allophane. In 1962 Morawiecki described a locality from Nowa Ruda, Lower Silesia, where a mineral very similar to alumohydrocalcite was found as narrow veinlets in shale and coatings on calcite and bauxite. Morawiecki concluded, on the basis of the optical data, that his material is orthorhombic and gave the name of β-alumohydrocalcite to it. The validity of this mineral, however, was not accepted by the Commission on New Minerals and Names, IMA. Kautz (1968) records yet another occurrence of alumohydrocalcite from a dolomite quarry near Bergisch-Gladbach, Germany, with a mode of formation very near that of the Khakassy district, Siberia, occurrence. Additional occurrences have also been reported by Aikawa, *et al.* (1972) and Popov (1972).

The chemical analyses of alumohydrocalcite from these occurrences do not show significant amounts of substitution in the cationic positions.

The data given on knipovichite and β-alumohydrocalcite are insufficient to adequately describe either mineral as a valid species. Because of the minute grain size and fibrous nature of "type" knipovichite, additional optical data that would confirm a crystal symmetry could not be obtained. Knipovichite could therefore have a higher crystal symmetry than alumohydrocalcite and be identical to β-alumohydrocalcite and thus a valid species. The data presently available, however, do not support this hypothesis.

On this basis the authors submitted a proposal to the Commission on New Minerals and Mineral Names, IMA, urging that knipovichite be discredited as a mineral species. This proposal was accepted. The name knipovichite should, therefore, be abandoned.

The discovery of chromian alumohydrocalcite from the area east of Mount Hamilton, California, adds a second rare mineral locality to the area, the first being the discovery of melanophlogite from a similar environment (Cooper and Dunning, 1972).

ACKNOWLEDGMENTS

The authors wish to express their appreciation to Dr. Michael Fleischer, of the U. S. Geological Survey, for his efforts in researching the literature on alumohydrocalcite and knipovichite.

REFERENCES:

AIKAWA, N., M. YOSHIDA and K. ICHIKAWA (1972). Discovery of dawsonite and alumohydrocalcite from the Cretaceous Izumi group in Osaka prefecture, southwest Japan. *Jour. Jap. Assoc. Mineral. Petrol., Econ. Geol.*, **67**, 370-385 (in English).

COOPER, J. F. Jr., and G. E. DUNNING (1972). Melanophlogite from Mount Hamilton, Santa Clara County, California. *Amer. Mineral.*, **57**, 1494-1504.

KAUTZ, K. (1968). Ein Vorkommen von Alumohydrocalcit und Allophan bei Bergisch-Gladbach. *Neues Jb. Mineral. Monatsh.*, 350-358.

__________(1969). Elektronenbeugung und Infrarot-Untersuchungen an Alumohydrocalcit. *Neues Jb. Mineral. Monatsh.*, 130-137.

MORAWIECKI, A. (1962). β - Alumohydrocalcyt z Nowej Rudy. *Kwart. geol. Warszawa*, **2**, 539-570.

NEFEDOV, E. I. (1953). Report from the scientific session of the Federov Institute together with the All-Union Mineralogical Society. *Zapiski Vses. Mineral. Obshch. (Mem. Soc. russe mineral.)*, **82**, 311-317.

PALACHE, C., H. BERMAN and C. FRONDEL (1951). *Dana's System of Mineralogy*, Vol. II, John Wiley and Sons, New York.

POPOV, V. S. (1972). Alumohydrocalcite from the Gaurdak deposit of native sulfur. *Uzbek Geol. Zhurnal*, **16**, no. 2, 65-69 (in Russian).

Mineralogical Society of Arizona Sponsors Arizona Mineral Showcase

Phoenix, Arizona

The Mineralogical Society of Arizona will sponsor the second annual Arizona Gem and Mineral Showcase during the last weekend of November 1975. The show will be held on the following days and times:

Friday, November 28, 1975 - 3:00 PM to 9:00 PM
Saturday, November 29, 1975 - 10:00 AM to 9:00 PM
Sunday, November 30, 1975 - 11:00 AM to 6:00 PM

The show will be held at the National Guard Armory, 52nd Street and McDowell Road, Phoenix, Arizona. The theme of the show is "a fiesta of Mexican gems and minerals".

The Mexican theme was chosen for several reasons, namely: the common heritage shared by Arizona and Mexico; the fact that Mexico, adjacent to Arizona, is a veritable supermarket of minerals; and, of course, the fact that many mineral collectors would consider their collections incomplete without specimens representing several locations in Mexico.

Several collectors of note have been contacted to enter special exhibits of Mexican minerals. Jim Mueller, Mueller's Gems and Minerals, Phoenix, Arizona, will exhibit 15 choice Mexican agates collected by him and his father (now deceased) more than 20 years ago. The Mueller agates have never been exhibited in a show of this type before.

In addition, David P. Wilber, perhaps the country's leading collector, has agreed to exhibit part of his extensive collection. Other collectors who will enter special exhibits include Harry and Jean Hamel from Los Angeles, California, and Wayne Leicht, Costa Mesa, California.

Several organizations will enter representative collections, the most notable being the Sonora Desert Museum, Tuscon, Arizona. To assure the Mexican theme, negotiations are currently being conducted with the government of Mexico to have a special exhibit of distinctive mineral specimens, placed on display. The initial contact included the request that the exhibit include some pre-Columbian artifacts relating to gems and minerals. Archeological excavations in Mexico have revealed several death masks made from jade or turquoise, as well as other types of material.

In addition to displaying some of the world's finest mineral collections, the show will include many artisans and craftsmen who work in silver, turquoise, gold, and semiprecious stones. Fourteen mineral and lapidary dealers will provide the opportunity for the most discriminating collectors to add to their collections.

Door prizes will be awarded and games of chance will give youngsters the chance to win mineral prizes for their collections.

Admission to the show is $1.00 for adults. Children under 12 are admitted free when accompanied by an adult. Ample free parking space is available.

A MINERALOGIST LOOKS AT HIS PROFESSION

by Paul Brian Moore

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The following was presented orally on February 15, 1975, at a meeting sponsored by the Mineralogical Record *and the Show Committee for the Tuscon Gem and Mineral Show, Tuscon, Arizona. Dr. Moore has consented to allow its publication in the* Record.

Several months ago I promised John White a few golden words about our science. Well, so much of the gold, I fear, has been transmuted into lead—a process which, I suspect, would have even disappointed a well-intentioned alchemist. After I elected to offer up some of my own highly personal glimpses into my life's calling, I almost quit in despair on several occasions, having much preferred the easier access through yet another technical paper. For technical treatises are objective, at least we hope, and don't bruise too many toes. So, after some protestations and frustrations, shirt sleeves went up and I resolved to give you a peek into my view of mineralogy as science, flavored with some salty opinions and, I hope, some sobering thoughts. I have come to believe that we are living in precarious times and that the very life-blood of our science, and intellectual activity in general, is threatened more than ever before, by very popular and seductive misconceptions. I feel that all popular media have so distorted and misrepresented scientific endeavor that it is the duty among the active members of this noble profession to allow at least a few words of their own.

A mineralogist may be concerned with the following things: the growth of crystals and the modification of their habits under varying conditions; the associations of crystals in time and space (called the paragenesis); descriptions of new species and their occurrences; distributions of species; identification and determination of species; stability of species with respect to ionic activity, temperature, pressure even magnetic field strength; physical properties; compositional ranges and limits; arrangement and description of the atoms in a crystal; effects of structure and composition upon color, hardness, density and a host of other physical phenomena; and perhaps the crowning understanding, the organization and relationship among species, particularly with respect to their structures and even the connection of structure itself with thermochemical stability. The ultimate goal is to describe each species in every detail and, from its structure, to derive all physical parameters including thermochemical stability. The last goal has, as yet, not been achieved.

Mineralogy is a rather unusual science in contemporary society for it is one which is peculiarly flexible. Unlike the high energy physicist who is necessarily dependent on elaborate and expensive laboratories, the good mineralogist can function reasonably well at all levels. Each specimen is, in a way, unique and affords a "fossil record" of inorganic processes. A mineralogist can choose to pene-

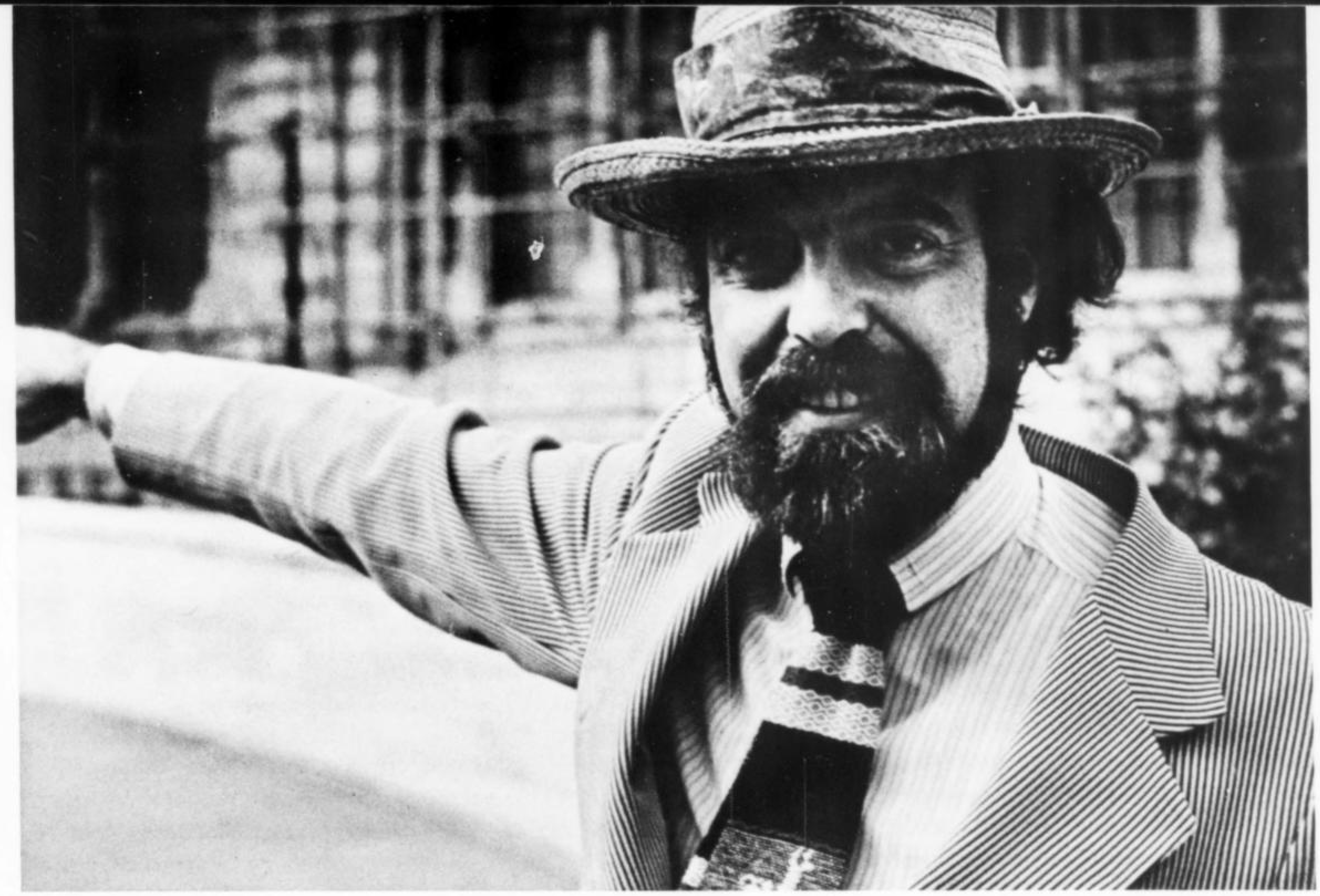


Fig. 1. **Paul B. Moore**

trate as deeply as he wants: a theoretician needs only pencil, paper, a handy library and good brains; a field man the experience akin to that of a master wine-taster, a highly intuitive faculty; an experimentalist can delve into thermochemistry and phase equilibria, crystallography and crystal structure, and behavior of materials. Interestingly enough, the theory of space groups and colored symmetry, elegant branches of what rightfully could be called pure mathematics, is still being advanced and largely by individuals who are in fact mineralogists. Mineralogists by and large unravel the intricacies of the arrangements of atoms in inorganic crystals. Mineralogists have a remarkable feel and intuition for solid materials that very few other professional scientists can boast. Simple notions like hardness, luster and specific gravity go a long way in assessing a solid substance. Incidentally, I suspect mineralogists are among the professional scientists which civilization, even at a rudimentary level, could not do without. This is because civilization—from the level of agriculture to the level of metal fabrication—is ultimately dependent on mineral chemistry.

It is enlightening and sobering to contrast mineralogical research of today with that of pre-war years—a mere thirty-five years ago. Much, if not most, mineralogical research today is supported by Federal and a few private funding agencies. An experiment which fifty years ago would have cost X dollars now costs ten-fold X. This is because equipment costs have increased an order of magnitude. If you don't believe me, just check the change in prices for test tubes, not to mention x-ray equipment and personnel costs. Another reason is that the required and expected precision of results has moved at least one unit more beyond the decimal point. Yet another reason is the realization that minerals are not simple parsimonious things but are subtle and complex—indeed labyrinthine—entities. As Peter Embrey recently remarked, in his usual eloquently sobering way, there will always arise a need for another paper on quartz.

But funding agencies are notoriously short-sighted. They cannot help it: money is tight, taxpayers don't see much point in science—in fact have become skeptical of it; the young in our society treat science as a scapegoat and consider it the source of all our ills. When push comes to shove, it is pure research that must always suffer. It is ironic that, if supporting agencies pull out of support of mineralogical research, the science will almost vanish and fall behind in its accomplishments even compared with the efforts some fifty years ago. This is because the standards in scientific merit and in quality of data have changed over these years, the demands of today being greater.

And what is pure research in mineralogy? It is the serious scientific inquiry into the behavior, structure and occurrence of minerals, regardless of their economic, sociological, political or aesthetic importance. Pure mineralogical research is more like art and music composition than engineering and other mission oriented activities. Its virtue lies in a paradox: As Oscar Wilde said "All art is quite useless". In short, its virtue lies in the delights of the mind. It is an intellectual, not a pragmatic-utilitarian activity. Like all intellectual activities, the investigator tends to work alone, at least in his most significant projects.

But let's get back to solid Earth. It is a popular misconception among the amateur community that professional mineralogists are scientists who profess a broad sweep and understanding of their natural science. Nothing can be farther from the truth! The vast majority are trained within a narrow speciality and are destined, maybe even condemned, to live out their lives in a single aspect of the field. Of the mineralogists in this country who possess a full, comprehensive grasp of the species, who are equally at home at a famous collecting locality as in the laboratory, who see their science in an historical perspective, its limitations and broad expanse as well, you can count within the fingers of your two hands. Part of this doubtless stems from the vastness of accumulated knowledge, the inherent difficulty in contemporary problems in mineralogy, but much of this arises from an insidious shift in our culture away from the concept of the Renaissance man and toward the narrow specialist. It is more comfortable to be a specialist today for you can elect to master one field which places you at its helm and in a position of indisputable authority. But such a specialist pays dearly in time, for any new insight, usually from the mind of a Renaissance man, will swamp the boat of that specialist and leave him without many resources. Like any other science, adaptibility and flexibility are the keys to success and effectiveness.

There is another component which shatters, I think, this popular belief. Many amateurs are convinced that a powder diffraction pattern is all that is needed to identify a phase, that is, a mineral species. They feel that their unknown can be identified in a matter of minutes, through a black box which does all the thinking. My experience suggests that this tool has just as often hindered as helped us. Subtle, yet important, differences such as superstructure, subgroups of some inferred space group, unusual solid solution, order-disorder and domain-type problems can be easily overlooked in a powder experiment. Phase equilibria among the calcium-magnesium orthosilicates, among which at least seven discrete phases have so far been recognized, are more easily misinterpreted than interpreted by powder diffraction studies, as a single crystal structure analysis has so effectively demonstrated. With these subtle but real misunderstandings, significant contribution to the science has been lost. It is my belief that there exists one tool, so powerful if intelligently used, that many questions can be answered (and many old answers questioned), and this is three-dimensional crystal structure analysis. In such a study, attempt is made to accurately locate every atom in the structure and to inquire further about the behavior of each of these atoms and the atoms taken together as chemically bonded units. Such a study requires competence in space group theory, Fourier analysis and, of course, a working knowledge of chemical bonding theory. Unfortunately, but few people have mastered this art in an effective, general way. More significant, perhaps, is the laborious nature of the study: average analysis of this type usually requires two months' work and several thousands of dollars of expense if the problem is to be tackled properly. Crystal structure analysis is the brilliant jewel of our science. It supersedes the elaborate, yet limited, morphological analysis of crystal forms so characteristic of late 19th Century and early 20th Century mineralogical science. If you in the amateur community demand careful study in the science of mineralogy then you must accept the fact that it is going to cost the taxpayer money. Problems are not solved by guesses; they are unravelled through hard, detailed, time-consuming analysis. Above all, prejudice on the part of the investigator must be minimized; an incorrectly named specimen is more damaging than no name at all!

I have often felt that a worthwhile—but admittedly difficult and frustrating—study would be directed toward the systematic analysis of phases which appear only as the thinnest plates, balls, crusts or fibers. Many compounds—owing to their structural aspect such as one short crystallographic axis and two long ones; or one long axis and two short ones; or their appearance as a metastable entity, formed through some process of nucleation—never see the light of day as lustrous single crystals ready to be plucked and analyzed in detail. Many of these phases are inorganic "fossil records" of the structural state of the complexes in the fluid coexisting with the solid. They are "frozen-in" states and have much to tell us. Yet, we are reluctant to study them: at best we can get a partial chemical analysis and a powder pattern but no structural information. In my laboratory there are least a dozen new species whose powder patterns are unique but for lack of suitable single crystals languish away in specimen drawers and filing cabinets. Therefore, their fate is relegated to silence. One fruitful avenue of research is through high resolution electron microscopy but since microscopists are so busy tackling more exciting and mission-oriented problems, they take a dim view of fussing over these substances. By the way, let me mention some very important species which have yet to be found in structure-analyzable single crystals; todorokite, a complex manganic oxide which is a major constituent of oceanic ferro-manganese oxide nodules so important today in speculative studies and surveys on future ore deposits and reserves; nsutite and birnessite, phases related to todorokite; allophane; chrysocolla; tinticite, eguëite, foucherite and a host of other basic ferric phosphates, of possible interest to soil scientists. Why don't we hear more about these kinds of phases? I suspect a simple reason.

The International Commission of New Minerals and New Mineral Names was organized to regulate the problem of species definition before the results hit the printed page. The Commission renders a valuable service to the science through its voting powers of international scope and through tacit agreements with editors of journals. By and large, new species are announced in publications only after approval from the Commission. A benefit has been the improved care and caution in defining species, a great reduction in redundancy and unwanted synonymy, a gradual purging of the literature of inadequately described species which prove to be varieties of well-established species, and so on. Unfortunately, and probably unintentionally, the Commission has dampened the publication of partial information on especially recalcitrant substances which simply don't occur in suitable quantity or in crystals sufficient for complete study. The result is that probably hundreds if not thousands of bits of information are hidden away in files and lost—perhaps forever—to the scientific community. This is the more unfortunate when it is realized in science that partial information is better than no information at all. Besides, results buried in files are a waste of taxpayers' money which, in many instances, supported the research going into these studies in the first place.

I reason the benefits of partial information this way: suppose investigator (A) isolates one milligram of a crust which upon optical examination appears to consist of homogeneous material. It yields a sharp powder diffraction pattern and he has a semi-quantitative electron probe analysis on it. Somehow, despite the strong influence of the Commission upon the journal editors, the partial information leaks through in the form of a publication. Investigator (B), elsewhere in the world (let us not forget that a publication is open to the world community of scholars!) recognizes the pattern for he just synthesized the compound in the laboratory and he understands its chemistry. At this stage, for all practical purposes, a new species is born. What good is it? Who knows? Like mountain climbing, it is important just because it is there, that *it exists* (a sufficient motivation for any scientific study) but in addition it may prove to be a critically important phase, for example, in the entire geobiological cycle of soils. I suspect that some of the most important phases in the soil sciences and in low temperature mineralogy are those we have not yet heard—let along even read—about.

But the real reason the Commission exists is a far simpler and more mundane one. It is because many scientists are inadequately informed, may have a tendancy toward sloppiness, or may be inexperienced or any combination of these. Like a good criminal lawyer dealing with his clients, a good mineralogist will get most of his new species through anyway, commission notwithstanding, and his newly christened species names will stick. The Commission, in effect, discourages mediocrity and incompetence. It is important to note, however, that the mills of the gods of time achieve the same effect: a careless worker is soon found out in the profession. Like psychoanalysts, mineralogists soon establish their professional hierarchy on the basis of the patients they study and how they handle them. As any mineralogist who is informed on the history of his science knows, the 19th Century had many productive mineralogists of a spectrum of competency who named many species. Blomstrand and his score species stood the test of time remarkably well—almost impeccably; but his fellow countryman Igelström (who named as many species) failed miserably.

Mineralogy is a science with a far greater diversity than any of us imagines. As I gaze over artifacts in an archaeological museum, I can't help but feel that many fascinating and important mineralogical problems are in store, waiting to be harvested by the serious-minded scientist. The crusts and patinas on bronze objects, the corrosion products so often the bane of the curatorial staff, the efflorescences on stone work, the mound of dust that was once an exquisite Assyrian chalice, all of these can only make the blood dance in the veins of a mineralogist. They are problems suited for him, he was trained to investigate them, there is so much for him to contribute! As I walk in an underground subway, inspect the walls of a magnificient cathedral—built some five hundred years ago—and witness the white inorganic equivalent of fungi, I know that there is much investigative work to be done. Walking up the steps to my laboratory in wintertime, I notice the white efflorescences resulting from crushed rocksalt acting upon concrete and the consequent acceleration of the entire weathering process.

Even to this day, we know but little about these corrosion products, their crystal chemistry and phase equilibria. Analyzing these delicate substances, I have found pickeringite, basaluminite, felsőbanyite, callaghanite, nesquehonite and many others. One ancient Caldean bronze bowl yielded up cuprite, azurite, malachite, paratacamite, botallackite, rosasite, and buttgenbachite. What a marvelous introduction into disequilibrium assemblages formed at low temperature! How it emphasizes the pressing need to unravel these low temperature phases, the chemistry of the aquated anisodesmic oxysalts—the bulk of the species in the mineral kingdom—the phosphates, arsenates, vanadates, sulfates, borates. How ironic it is that we know so little about these mineralogical stepchildren and even less about their role in our civilization.

Let me tell you more! Human and mammalian prostatic and urinary infections have afforded the crystallization of such phases as apatite, whitlockite, monetite, weddellite, whewellite, struvite, oxammite, newberyite, dittmarite and hannayite *right within* the organism. Other phases, as yet unrecorded as mineralogical entities, have also been recorded. What about the inorganic phosphate cycle in soils, a problem of considerable importance today owing to the phosphate pollution problem? Well, phases documented include not only strengite, variscite, vivianite, apatite and crandallite, but also azovskite, laueite, strunzite, beraunite, dufrenite, rockbridgeite, montgomeryite, mitridatite, taranakite, minyulite, leucophosphite and many others. Take the phases encountered in the slag, fertilizer, cement and brick industries; phases like merwinite, bredigite, silico-carnotite, iscorite, hilgenstockite, nagelschmidtite, tobermorite, portlandite, foshagite and many more in addition to these—more well-known feldspar, melilite, quartz and so on. Do you know that the phosphatizing or "pickling" process leading to more weather-resistant steels affords hureaulite as one of the surface phases? Do you know that a city built of larnite phase will surely "fall", but one stabilized by the addition of some magnesium and barium into the calcium orthosilicate systems will be constituted in part of merwinite and bredigite instead and will assuredly remain stable?

These observations lead me to conclude that our species, *Homo sapiens*, tends to think on big, gradiose and massive terms, has significant talent in matters of quantity and frequency, but is at best feeble intellectually in matters of subtlety. The very reactions eating away at our civilizations, not only the psychological and psychosomatic ones, but the crystal-chemical inorganic metasomatic ones, in the final analysis I submit we know very little about.

Now you might misunderstand me about the glorious problems awaiting the student in corrosion products and that these products are *ipso facto* composed of discrete mineralogical phases, new species of which are deserving of a new trivial name. Nothing could be more remote from my intentions! One of the tenets of our science is the insistent use of trivial names only for those compounds which formed independent of the intervention of Man. Why should this be so? Is it because this is manifest in any natural science, in any study of the evolution of species, that those objects which formed outside of Man's actions be deemed somehow separate from the synthetic compounds or, for that matter, synthetic hybrids which we come to recognize in domesticated animals and plants. The inability to discriminate between organisms which arose through selective evolutionary pressure from those induced to mate by Man's intervention to form hybrids would have chaotic consequences in the whole field of evolution theory. The same is with minerals, the inorganic equivalents of selective evolution. Confusion between *natural* and *synthetic* (or *artificial*) will only mask understanding of the natural course of things, will only blur the equilibria (and disequilibria) of Nature's own design from those of our own making and choosing. Personally, I feel that all trivial names or specific terms for objects derived in some way from Man's interventions should be abandoned. Rather, they should be called in their formal chemical language, at least until a natural counterpart is discovered.

But this does not mean that a mineralogist should refrain from study of synthetic, man-made objects. On the contrary. His tools and his experience are almost peculiarly and uniquely suited for it and many an archaeological museum will be thankful for the efforts of the mineralogically trained, as well as the myriad laboratories engaged in bio-inorganic chemistry and in the chemistry of fertilizers, slags and cements. In many respects, the mineralogist is an inorganic physical chemist. Why construct boundaries if they only obstruct and retard the acquisition of knowledge and insight?

It is sad that we have lost the spirit of 19th Century naturalism in the pursuit of present-day science. Today, the utilitarian aspects of a problem takes priority over innate curiosity. Many problems, though they are hardly trivial, are deemed useless because they have no immediate application. Hence, the relative neglect of new species unless they crop up in some mission oriented study. If they do in that study, then the investigator gains fame and in an investigation no more difficult than the detailed investigations of a new species of no immediate commercial or political importance. The practice of science is a human institution, and like all human institutions tends toward practical and utilitarian ends where the community at large can identify and feel comfortable in these accomplishments. But serious scientific inquiry extends far beyond the practical.

So, where is our science heading? What is the future for mineralogy? I hope I have convinced you that description of species alone is not the essence of our intellectual activity. I believe that the ultimate goal is to wed structure at the atomic or crystallographic level with the stability of the species, the link between structure and paragenesis. At present, I can only say that the wedding is an adolescent one at best, and as yet the partners have failed to consummate their marriage. We have an abundance of facts but a deficit of understanding. We have hardly begun to integrate the species into a unified whole; as yet, no one has succeeded in predicting a new species *a priori*. Our science is still very much in its infancy; don't be overly impressed with its technicul aspects for much of this is still groping in the dark.

MINERALOGICAL SYMPOSIUM AND SHOW IN MANITOBA

The Mineral Society of Manitoba will be holding a Mineralogical Symposium and Show on October 16, 17 & 18, 1975 at the Manitoba Museum Man and Nature, 190 Rupert Ave., Winnipeg, Man., Canada.

The Symposium will consist of displays of minerals, lectures, workshops, field trips and mineral dealers.

Among the speakers will be Paul Desautels, Supervisor of the Mineralogical Dept. of the Smithsonian Institution, Robert Gait, Assistant Curator of the Royal Ontario Museum, Peter Cerny, University of Manitoba (Geology Dept.), and Richard M. Pearl, Professor of Geology, Colorado College.

There will be two field trips, the first on Oct. 15 to the tantalite, cesium, lithia deposits at Bernic Lake, the second on Oct. 19, to Souris for agates, petrified wood, jasper, etc.

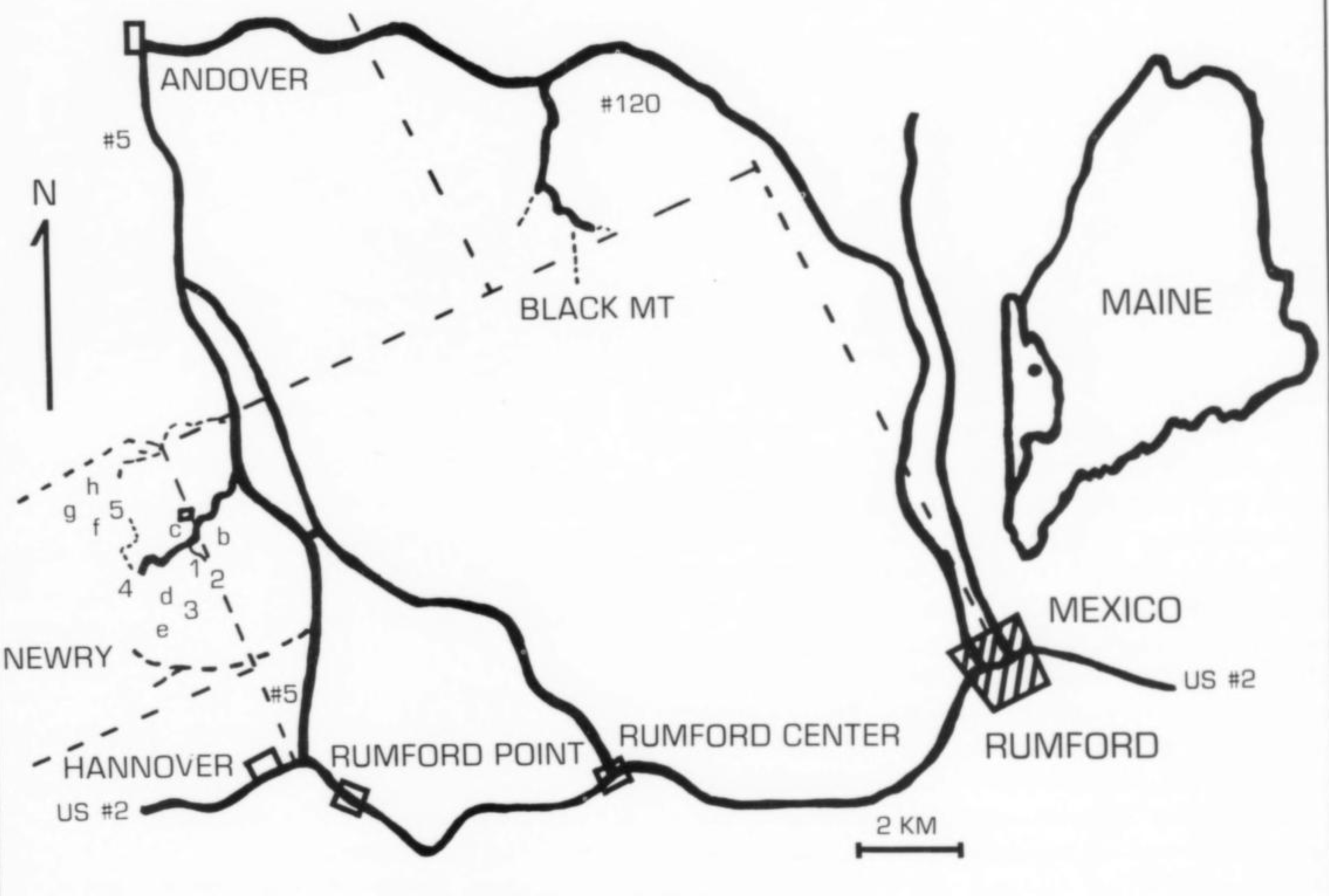
The Symposium fee will be $15.00 for the three days. The hours: 10:00 AM to 9:00 PM Thurs. & Fri., 10:00 AM to 6:00 Saturday.

The Show Chairman is Mr. L. Kinsbergen who can be contacted at the above address.

NEWRY MAINE

A PEGMATITE PHOSPHATE LOCALITY

by Vandall T. King
Mutton Lane Road
Clinton, Maine 04927
photomicrography *by Julius Weber*



NEWRY, MAINE AREA

ABSTRACT

The Newry quarries have produced at least 111 different species. Forty-three of these species are phosphates. There are five principal collecting sites: Nevel quarry, Bell pit, Dunton gem quarry, Scotty quarry, and rose quartz crystal area. The quarry histories are discussed.

Some of the more interesting minerals are described and illustrated with photographs. A comprehensive list of species is published for the first time.

INTRODUCTION

The Newry area has long been famous for its elbaite and for its unusual minerals. As the elbaite from this locality has received wide publicity recently, it is felt that the unusual, though sometimes inconspicuous, minerals should also be given mention.

Ninety-eight species are reported from the pegmatites. In addition, at least seven other minerals remain unidentified. Another thirteen species occur in the non-pegmatitic host rocks. Most of the rare pegmatite minerals occur as micro-minerals, but Newry has been a favorite area with hand-specimen and cabinet-specimen collectors. A collector familiar with the Newry minerals may find forty different species in a day's collecting.

Active mining and exploration are now going on at these areas, so all of the collecting sites have been closed as a a safety and security measure. The Plumbago Mining Corporation employs a full-time guard to enforce its policy. Unrestricted collecting may not resume for a number of years.

LOCATION AND NOMENCLATURE

Newry is located in northern Oxford County, Maine. The quarries discussed in this paper are located in the eastern corner of the Newry township and are all within a few hundred meters of the Rumford town line.

There are five principal exposures and all of them are located on two adjacent ridges. The first three quarries, in the order that you approach them from route #5, are (1) Nevel quarry, (2) Bell pit , and (3) Dunton gem quarry. These exposures are on Hall's ridge. The remaining two quarries are located on the higher summit to the north known as Plumbago Mountain. These sites are (4) Scotty quarry and (5) the rose quartz crystal area. Figure 1 shows the approximate quarry locations with respect to the local area. For an accurate representation of the contour intervals and other surface relationships, see the United States Geological Survey, 15' series, topographic maps of the following quadrangles: Rumford, Old Speck Mountain, Bethel, and Bryant Pond. The Newry Mine, so labeled, on the Rumford quadrangle map is the Dunton gem quarry. Detailed geologic maps can be found in Shainin and Dellwig (1955) and Cameron, et al (1954).

Fig. 1a. **Hall's Ridge**

Fig. 1c. **Frank Perham prospect**

Many collecting localities are known by more than one name. This is also true at Newry. The following is a list of generally accepted names as used by the majority of local collectors and professional researchers. Included are occasionally used synonyms. The first entry is always the preferred. Numbering and lettering are based on the proximity to route #5.

- a. lower prospects
- b. Red Crossbill pegmatite
- c. Frank Perham prospect, 1970 prospect
- #1. Nevel quarry, twin tunnels, United feldspar quarry, Whitehall quarry, Abbott quarry

Fig. 1b. **Lower prospect**

Fig. 1d. **Nevel quarry**

#2. Bell pit, 1964 quarry, false quarry
  d. Crooker pegmatite
#3. Dunton gem quarry, Hall's ridge, Nevel tourmaline quarry, Neville tourmaline quarry, Newry hill, pollucite quarry, Plumbago gem quarry, Newry mine
  e. Kinglet quarry
#4. Scotty quarry
#5. rose quartz crystal area, Whitehall prospect, Plumbago mountain
  f. Whitehall prospect
  g. Plumbago mountain area
  h. Spodumene brook pegmatite

Numerous small unnamed prospects exist in addition to the above.

Worthy of particular note is the use of "Newry Hill". This name seems to have been coined in the literature and has been quoted from paper to paper. As there is no geographic entity "Newry Hill", and as there is a plethora of exposures near the original Dunton gem quarry, the name should be abandoned. "Newry Hill" is an unnecessary synonym for Hall's ridge.

HISTORY OF OPERATIONS

Recent publications have done much to confuse the history of the area. In addition, there is no publication that has the collected histories of the thirteen mentioned sites, although Shainin and Dellwig (1955) is fairly complete. The histories will be discussed in the order of the exposure's proximity to route #5.

a,b,c, A series of beryl and feldspar prospects along the road up Hall's ridge were first explored during World War II. The prospect immediately before the Nevel quarry is a recent opening by Frank Perham. In 1970, the prospect produced some high quality commercial feldspar. Further collecting at this site might prove worthwhile as heterosite, eosphorite, strunzite, and vivianite have been found here.

1. The first large exposure is the Nevel quarry (twin tunnels) which was opened in 1936. The bulk of mining activity took place during 1941-5, but continued during 1948. Feldspar and muscovite were the chief minerals recovered. Much spodumene was encountered as well. The largest spodumene crystal found was 3.1 x 1.2 x 0.1 meters in size (Shainin and Dellwig, 1955). Feldspar mining continued again in 1956 and in 1964.

2. The Bell pit is directly southeast of the Nevel quarry and was operated by the Bell Mineral Company for feldspar. This exposure is in the same rock unit as the Nevel quarry. Previous to 1964, a small opening known as the false quarry occupied this site. The old name should be retained on all specimens so labeled to indicate when the pieces were recovered.

3. The Dunton gem quarry, which rests on the back side of Hall's ridge, often has been referred to as the Neville (sic) tourmaline quarry. A recent article by Trapp (1973), gave the history of the tourmaline location at Mount Mica, Paris, Maine, as the history of the Dunton gem quarry. The Dunton is the most interesting quarry, mineralogically, and for this reason it will recieve the most detailed history and description. An excellent account of the history is given by Shaub (1960).

Fig. 1e. **Bell pit**

Fig. 1g. **Scotty quarry**

"The first exploration of the Dunton pegmatite was made by Edmond M. Bailey of Andover, a prominent mineral collector, about 1898. At that time, a few shots were placed in the pegmatite in search for gem tourmaline and good mineral specimens. During the next four years, apparently nothing more was done at the tourmaline site. On September 27th, 1902, Dr. Hiram Francis Abbott of Rumford Point made a note in his diary saying 'went to R. Falls and saw Mr. Pettengill and he gave me permission to open up the tourmaline deposit on Newry—Found McCrillis had been to Mr. Pettengill to get in ahead of us but had bad luck.' A month later he made the following entry, dated October 27th, 1902: 'C. L. Potter of South Waterford brought over miners of the Oxford Mica Mining Co. and lodged them with Joshua H. Abbott' who resided at the foot of Newry Hill, for work at the tourmaline deposit. On December 22nd, 1902, Dr. Abbott 'paid Joshua H. Abbott $10.00 on his bill vs. O.M.M. Co. for boarding mining crew.' Between September, 1902 and February, 1903 the ownership of the mineral rights apparently passed from Mr. Pettengill to Mr. Hollis C. Dunton for on the fourth of February, 1903 the doctor noted that he drove to R. Falls with Mr. Potter and he called on Hollis C. Dunton to see what shake Mr. Potter and myself were to have in the tourmaline business and Mr. Dunton says that we are to have an equal share with two others as promoters and one cash member; of 1/2 of profits and losses'. From the above notes it appears that Dr. Abbott should be given credit for having first opened the Dunton gem mine on an attempted commercial basis; however Potter, as superintendent of the O.M.M. Co. and other mines must have had much to do with the operation. It was at this point, apparently, that Mr. Dunton had the first and last voice and hence the mine became known as the Dunton gem mine.

***Fig. 1f.* Dunton gem quarry**

***Fig. 1h.* Rose quartz crystal area**

After about two and a half decades had elapsed following the work of Dr. Abbott, Wallace D. Nevel of Andover reopened the quarry in 1926 and worked it for two years for the mineral pollucite on behalf of the General Electric Company. This operation for pollucite was economically successful as the mineral was extremely important and in considerable demand at that time for supplying cesium for the manufacture of radio vacuum tubes. During this operation the pegmatite was completely opened to the center of the body thus giving the mineralogists and geologists an inside view of one of the really spectacular mineral occurences for their inspection. In 1929, additional work was done, but the pollucite had been worked out during the previous operations.

In 1949, Harvard University released a few blasts but no additional tourmaline was found."

Peacor (1960) states that the dumps were worked for amblygonite, spodumene, and feldspar in 1935.

The present operators refer to the Dunton gem quarry as the Plumbago gem mine. The name serves to designate the specimens recovered by that company. As the older Dunton name is well established, it seems unlikely that collectors will refer to the Dunton gem quarry by this name. Some collectors who have specimens of the rarer minerals from the present working label them Dunton 1972 quarry. The dated name is a good practice. A detailed account of the new operations was given in an article by McCrillis (1975).

d,e The Crooker and Kinglet pegmatites were explored for pollucite contemporaneous with the working of the Dunton gem quarry.

4. The Scotty quarry is a seldom visited site on the side of Plumbago mountain. This opening was made during 1949 for beryl and much mining occurred until 1954.

5. The rose quartz crystal area is near the summit of Plumbago mountain. This is a small prospect which has been mainly hand-worked for rose quartz crystals since its discovery by George Crooker in 1942. Some blasting was

done by Harvard University for amblygonite crystals in 1959. This opening has been erroneously called the Whitehall prospect.

f. The Whitehall prospect is a large though unimportant prospect approximately 75 meters away from the rose quartz crystal area. For the most part this outcrop has produced no unusual minerals although much low quality beryl and small amounts of gem aquamarine have been found.

g.h The Plumbago mountain area and the Spodumene brook pegmatite are World War II exploratory sites for beryl. The Plumbago mountain area has produced several heterosite pseudomorphs after terminated triphylite crystals and large spodumene crystals are naturally exposed in the Spodumene brook. These minerals indicate potentially important collecting sites if either is developed into economic mining. The general area is now being explored for the possible economic condition.

GEOLOGY

The rocks of interest in this area are granitic pegmatites, that is, very coarse grained rocks with a composition similar to a normal granite. The main pegmatite (Nevel quarry and Bell pit) and the Dunton pegmatite show well defined internal zonation.

The pegmatites are Devonian igneous intrusions into actinolite-schist, gabbro, quartz-muscovite-schist, etc. These pegmatites are presumed to be related to the large granodiorite body to the north (Shainin and Dellwig, 1955)

LISTING OF MINERALS

Before a description is begun, a listing should be made of those species identified thus far from Newry. As with any other major locality, some collectors and professionals are too eager to increase the list of reported species. This author has made every attempt to authenticate each entry. Most species have been personally collected or have been viewed in private or public collections. The remaining species come from reliable publications such as Frondel (1956) or Shainin and Dellwig (1955).

Previous lists appear unsatisfactory for three reasons other than their brevity: misidentifications, confusion in nomenclature, and pranksters. For example, Bastin (1911) and other field workers have listed emerald at Newry. The basis for the name appears to be that the beryl is green rather than having a chromium or other trace element content. David Seaman (personal communication) inspected a "Newry" emerald that was found by a boy scout several years ago. Based on the nature of the schistose matrix, Seaman believes that the specimen originated in an Austrian deposit and was later left at the Dunton gem quarry. Another misidentification may be wavellite. Morrill (1958) and a letter from Gunnar Bjareby (1961) list this mineral, but no valid specimens seem to exist. The identification may have been made visually on specimens of eosphorite, moraesite, uralolite, roscherite, etc., all of which can resemble wavellite.

Changes in nomenclature have added confusion to identifying Newry minerals. For example, rockbridgeite was not recognized as a new mineral species until 1949. Specimens of this mineral were called dufrenite, which resembles rockbridgeite in composition and form. In a similar manner, childrenite was named before eosphorite. When new species, especially those of a solid solution, are found at a locality, they are often not recognized as new and are included under old definitions.

Finally, the hardest minerals to authenticate are those left by or supposedly found by pranksters. Some old time collectors would let the quarryman "find" gold, corundum, or some such exotic species in the freshly blasted debris. Often, the piece would go back with the old timer without the quarryman suspecting the hoax. The specimen would subsequently be relabeled and there would be no trace of the original reference. Modern collectors are no less guilty. Agate has been left at the Scotty quarry and geodes resembling those from Keokuk have been found at Mount Mica, Paris, Maine.

The species found at Newry are listed below and the numbers after each entry indicate the sites where the mineral has been found.

1. Nevel quarry 2. Bell pit 3. Dunton gem quarry 4. Scotty quarry 5. rose quartz crystal area

albite- 1,2,3,4,5
almandine- 3
amblygonite- 1,2,3,5
arsenopyrite- 1,2,3
augelite- 2
autunite- 1,2,3,4
beraunite- 2,3
bermanite- 3
bertrandite- 1
beryl- 1,2,3,4,5
  v. cesian- 3
beryllonite- 3,5
beta-uranophane- 3
biotite- 3
bismuth- 3
bismuthinite- 1
brazilianite- 2,3,5
carbonate-apatite- 1,2,3,4,5
cassiterite- 1,2,3,4,5
chalcopyrite- 3,4

chrysoberyl- 3
clarkeite- 3
columbite- 1,2,3,4,5
cookeite- 3,5
diadochite- 2,3
dickinsonite- 1,3
v. ferroan- 3
elbaite- 1,3
eosphorite- 1,2,3,5
fairfieldite- 1,2,3,5
ferrisicklerite- 1,2,3(?),4,5
fluorapatite- 1,2,3,4,5
fluorite (?)- 1,2
fourmarierite- 3
galena- 1,5
goethite- 1,2,3,4,5
goyazite- 2,3,5

hematite- 1,2,3,4,5
heterosite- 1,2,3(?),4,5
hureaulite- 3
hydroxyl-herderite- 1,2,3,5
ilmenite- 3,5
jahnsite- 2,3
kaolinite- 3
*landesite- 3
laueite- 2,3
lepidolite- 1,3
lithiophilite- 3
ludlamite- 2,4
magnetite- 4
malachite- 4
manganocolumbite- 3
manganotantalite- 3

manganite- 3
microcline- 1,2,3,4
  v. amazonite- 1,2
microlite- 3
mitridatite- 2,3
monazite- unspecified (Vitro Co.)
montebrasite- 3
montmorillonite- 3
moraesite- 3,5
muscovite- 1,2,3,4,5
opal v. hyalite- 3,5
petalite- 3
phosphuranylite- 3
pollucite- 3
purpurite- 3
pyrite- 1,2,3,4,5

*status in doubt (Moore 1973)

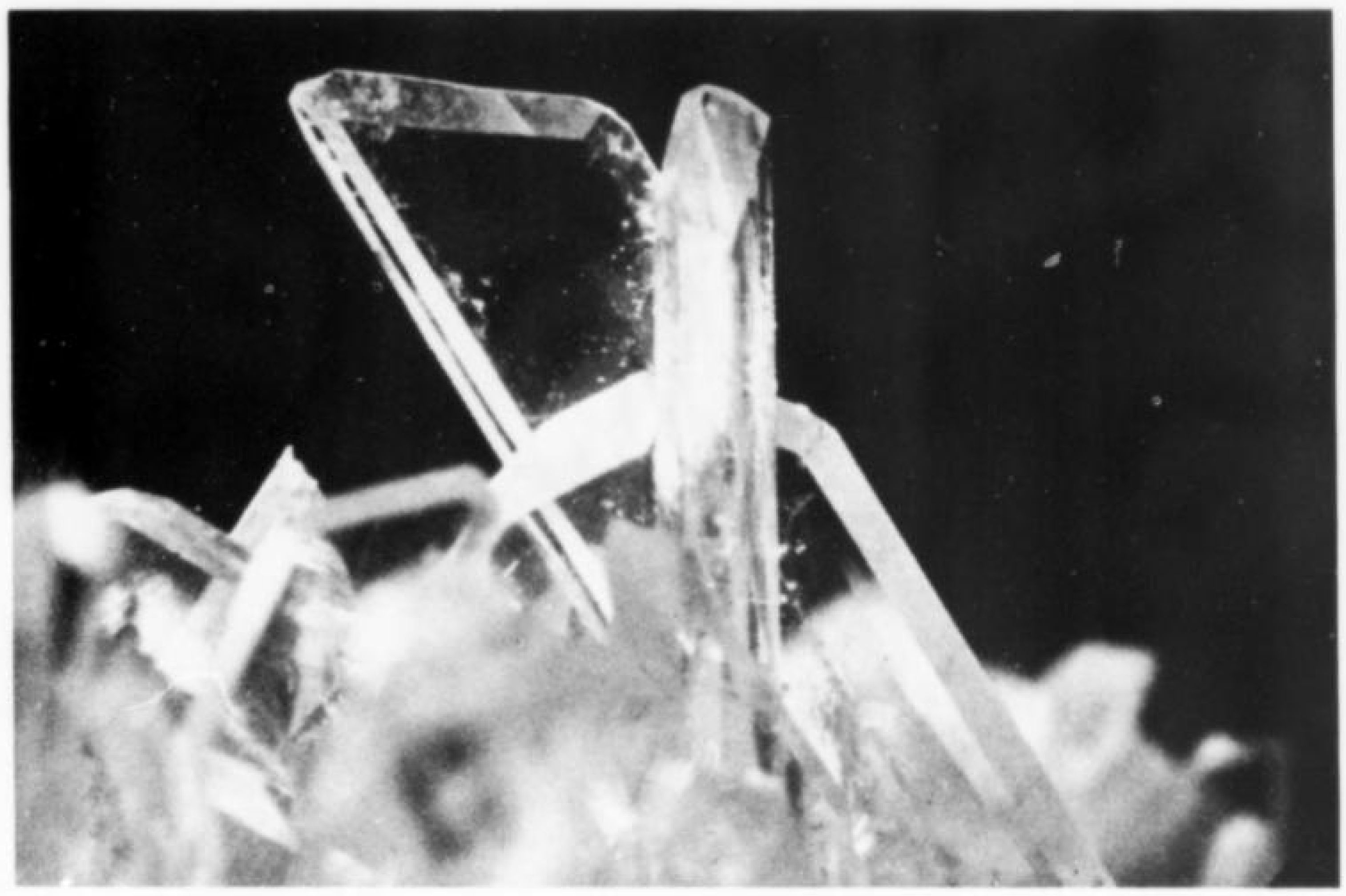
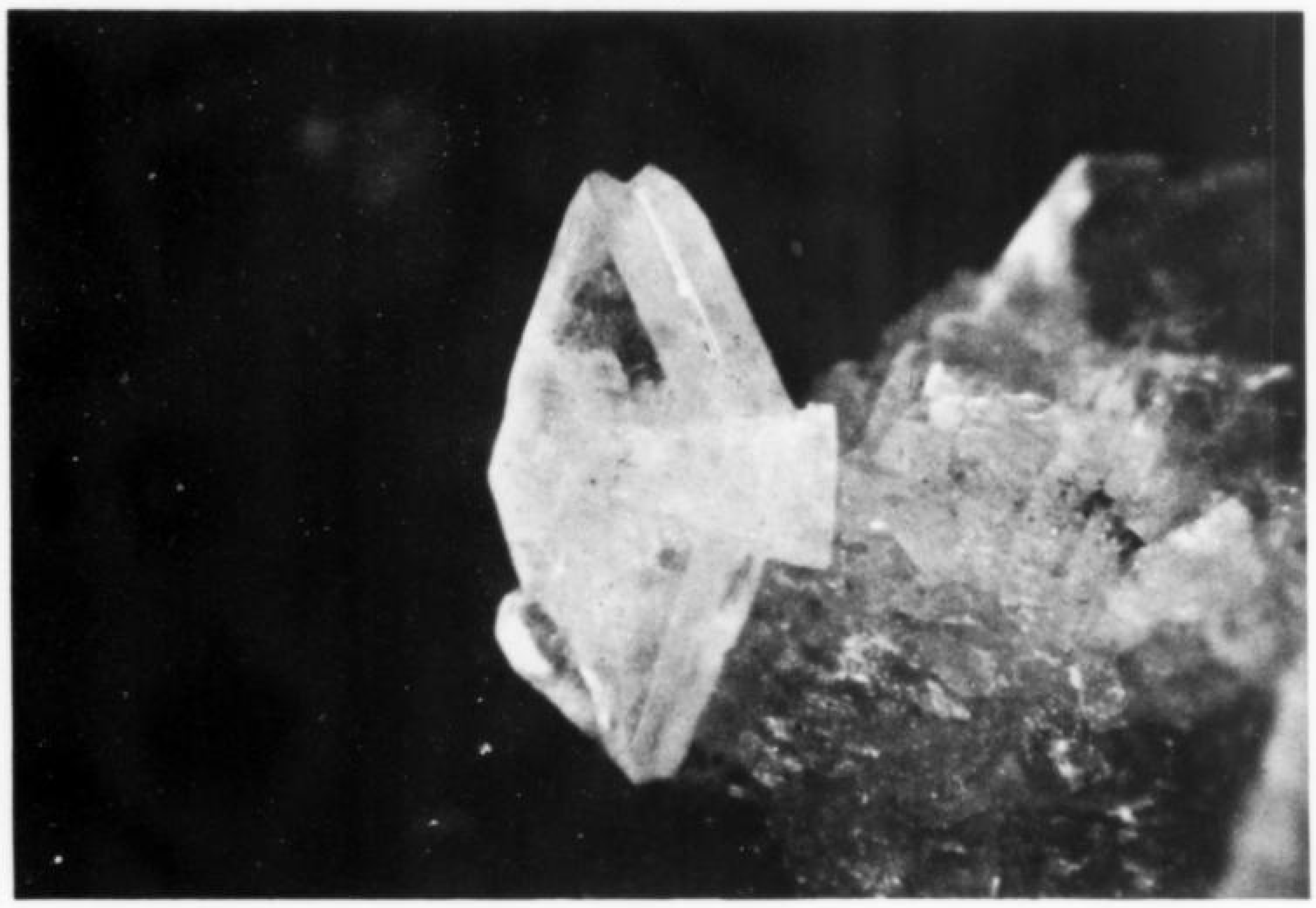


Fig. 2. **Bladed amblygonite (7 mm). Bell pit. Merill collection.**

Fig. 3. **Blocky amblygonite (8 mm). Bell pit.**

Fig. 4. **Albite (3 mm). Dunton gem quarry.**



pyrolusite- 1,2,3,4,5
quartz- 1,2,3,4,5
reddingite- 3
rhodochrosite- 1,2,3
rockbridgeite- 1,2,3
roscherite- 1,3,5
rutherfordine- 3
schorl- 1,2,3,4,5
scorzalite- 3,4
sicklerite- 3
siderite- 1,2,3
spessartine- 3
sphalerite- 1,2,3,4
spodumene- 1,2,3,5
stewartite- 3
strunzite- 2,3,5

Fig. 5. **Carbonate-apatite (0.8 mm) and hydroxyl-herderite. Rose quartz crystal area.**

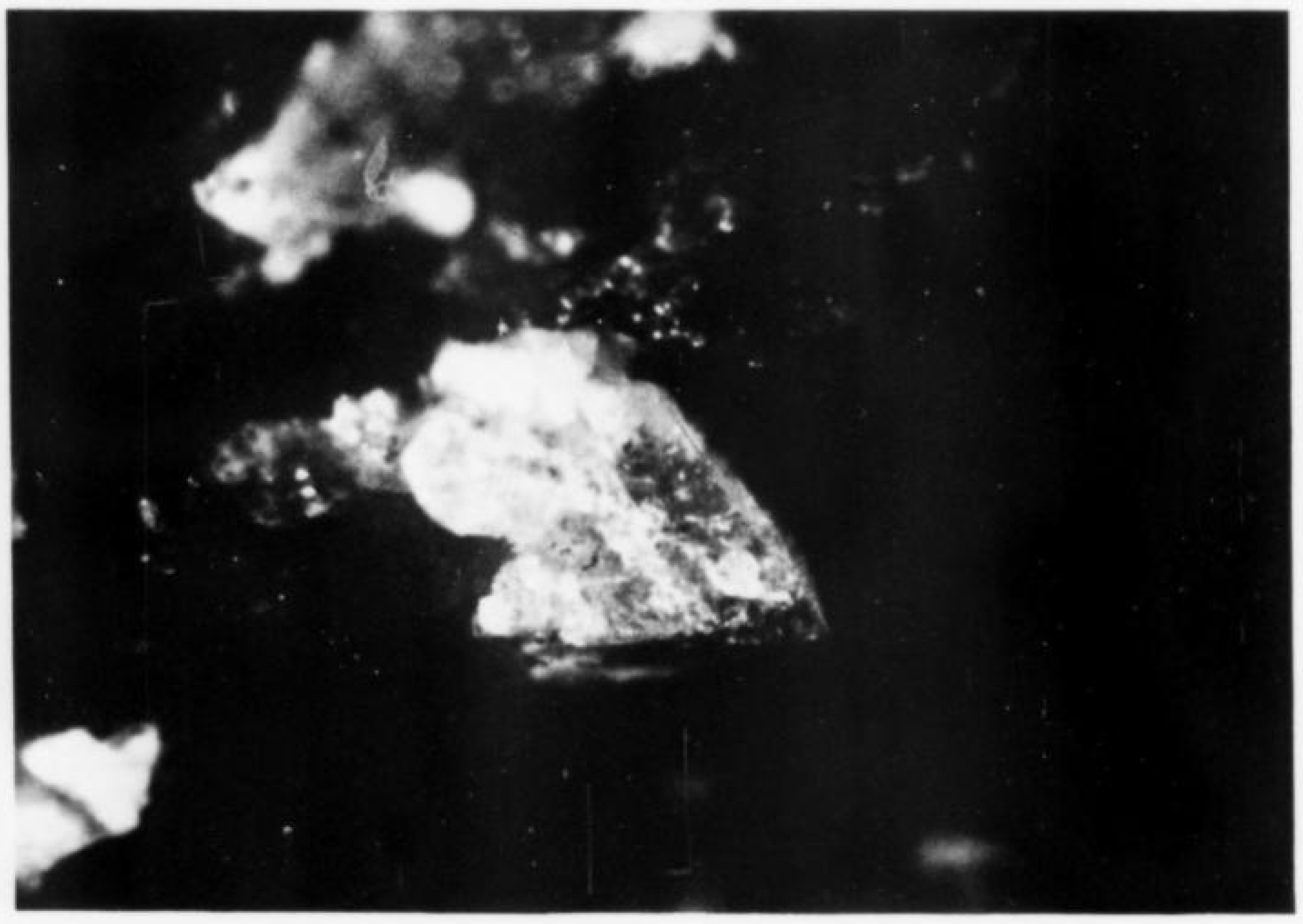
tantalite- 3
tapiolite- 1
torbernite- 2,3,4
triphylite- 1,2,3(?),4,5
uralolite(Dunn)- 3
uraninite- 1,2,3,4
uranophane- 3
vandendriesscheite- 3
vivianite- 1,2,3,4
wardite- 2,3,5
wavellite(?)- 3
whitlockite- 2,3
whitmoreite- 2
wurtzite- 2
xanthoxenite- 3
xenotime- unspecified (Vitro Co.)
zircon(cyrtolite)- 1,2,3,5

Fig. 8. **Eosphorite crystal with quartz coated termination (4 mm). Nevel quarry. Woodman collection.**

Unknowns

Author's pearly
botryoidal-3
Bjareby's yellow
tetragonal-5
Fraser's (1930)-3
Frondel's (1956)
mineral C- 3
Brown hexagonal plates- 2
Yedlin's purple
tetragonal-1

Fig. 11. **Pseudo-octahedral wardite (1 mm). Dunton gem quarry.**



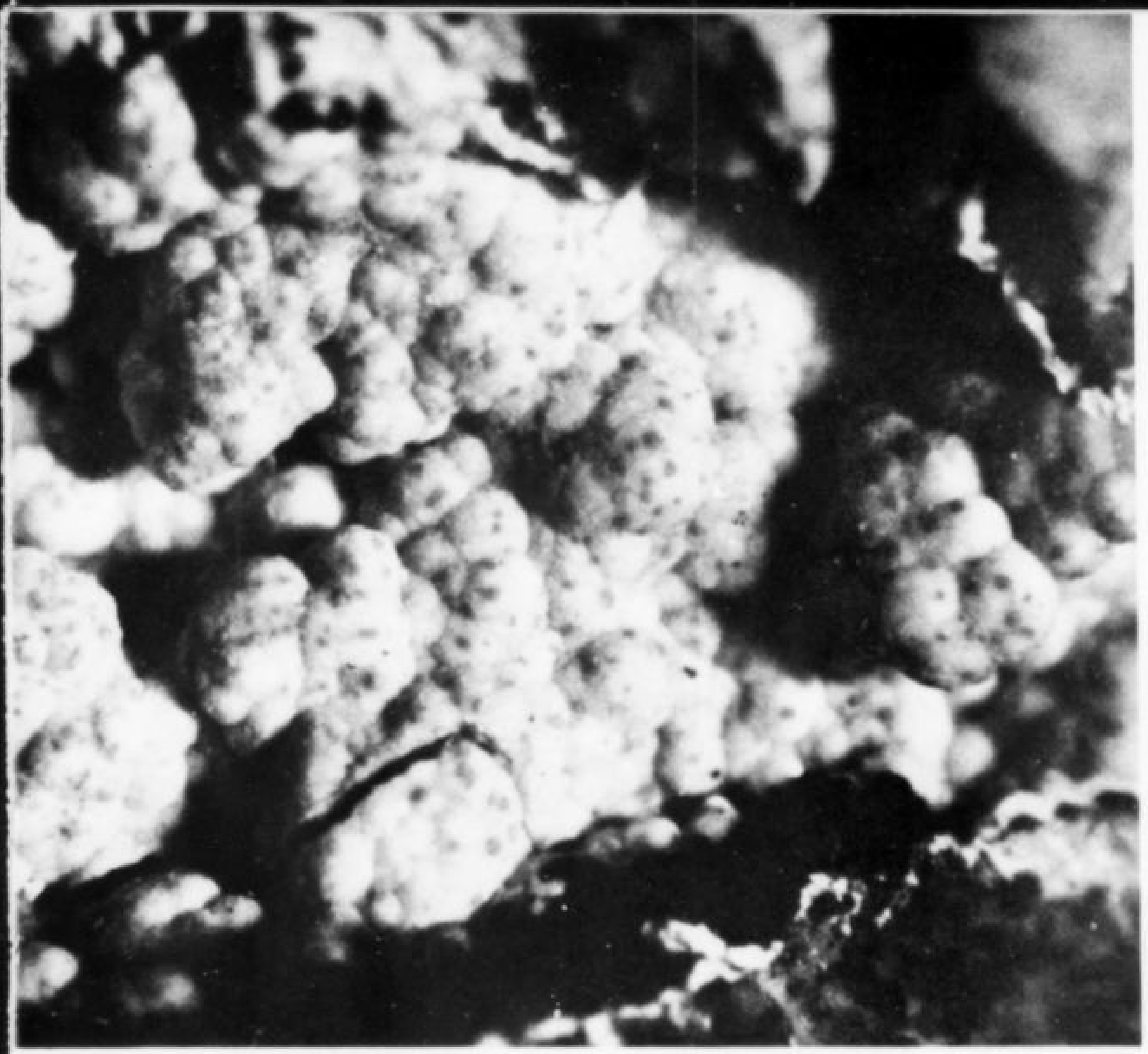


Fig. 6. **Carbonate-apatite botryoids (0.7 mm). Dunton gem quarry.**

Fig. 9. **Fairfieldite rosettes (white) with hydroxyl-herderite (2 mm) rosettes. Dunton gem quarry.**

Fig. 12. **Fibrous beryllonite with light hydroxyl-herderite and dark roscherite botryoids (= 1 mm). Dunton gem quarry.**

Fig. 7. **Fluorapatite crystal (3 mm). Dunton gem quarry.**

Fig. 10. **"Wheat sheaf" fairfieldite (5 mm) clusters. Bell pit.**

Fig. 13. **Hydroxyl-herderite with roscherite (3 mm). Dunton gem quarry.**

The minerals that have been found in the country rocks thus far are: (Shainin and Dellwig, 1955; Peacor, 1960)

actinolite
anorthoclase
anthophyllite
biotite
calcite
diopside
fluorapatite
unidentified garnet
graphite
hematite
hornblende
labradorite
magnetite
microcline
muscovite
oligoclase
orthoclase
prochlorite
pyrrhotite
quartz
schorl
staurolite
titanite
zircon

In addition to the above listed species, the following have been suggested in the literature or by some collectors. There seems to be no justification for their entry as minerals found at Newry and they should be considered misidentifications until valid specimens are found. (Note: some of these have been discredited as being mixtures, etc., and are no longer considered to be valid minerals.)

alunogen
augite
childrenite
corundum
cymatolite
dravite
dufrenite
emerald
gummite
hatchettolite
hiddenite
kasolite
killinite
lazulite
pharmacosiderite
phenakite
phosphosiderite
pinite
prehnite
psilomelane
silver
tavorite
triplite
uranopilite
yttrocerite

Descriptions

In order to more easily discuss the unusual Newry minerals, it seems appropriate to group species that commonly occur with each other. As primary and secondary species are often found together, they will not be treated separately. Unless noted, all photographed specimens are from the author's collection and all descriptions are pertinent to any Newry site.

1a. cleavelandite
b. beryllonite
2. triphylite-lithiophilite
3. amblygonite-siderite-quartz

GROUP 1a

The clean, white matrix found at Newry that is a common associate of minerals is cleavelandite. Cleavelandite is a lamellar form of ordinary albite. This mineral is common at Newry and is especially so at the Dunton gem quarry.

This matrix is interesting in that the unusual minerals do not generally occur in gas or solution vugs, but rather in interstitial spaces. The lamellae of the cleavelandite commonly intersect each other instead of occurring in parallel to sub-parallel groups. The intersections result in void spaces that could contain late-stage minerals. In contrast, cleavelandite at the rose quartz crystal area does not have many interstices, but has the usual solution and gas cavities, which seldom exceed 10 mm.

Amblygonite-Montebrasite

Newry is renowned for its superb amblygonite crystals. Although Pough (1960) pictures a particularly rough crystal; transparent, sharp crystals were found at the Nevel quarry in excess of 10 cm, in addition to many small crystals.

The Dunton gem quarry crystals are generally small and require 10-20x for comfortable viewing. At this quarry, the crystals occur as fishtail twins superficially resembling those of gypsum. Quartz crystals are associated. Amblygonite crystals at the Bell pit are found in two habits: tabular and blocky. These crystals might be confused with albite unless care is taken in making sure of the exact crystal shape. The tabular amblygonite from the rose quartz crystal area is yellow and has been often misidentified as brazilianite.

Montebrasite has been identified optically by Fraser (1930). Montebrasite cannot be distinguished from amblygonite visually and it is possible that many specimens labeled amblygonite are really montebrasite.

Identification of amblygonite-montebrasite can be made by crystal shape, by its twinning, by its good cleavage and by its intumescence while being fused.

Carbonate-apatite

This mineral occurs in a variety of habits, but there are generally two types: crystals and botryoids. The crystals are simple prisms with basal terminations; however an important characteristic is that the crystals usually taper toward each termination. The terminations are usually crude and rounded as well. The color is white to cream, but grades to brown. The luster is waxy to earthy. Crystals are usually less than 2 mm.

Carbonate-apatite also occurs as earthy botryoidal coatings. The coatings may be rough or smooth, but the important characteristic is the absence of a pronounced fibrous internal structure.

Fluorapatite

Fluorapatite is found as simple prisms with basal terminations, but they are sharp and the edges are not curved. Crystals with complex frosted terminations are also found. The luster is vitreous and the color is green, blue, purple, or clear. The crystals are 1-10 mm.

Light purple crystals have been found coating seams in the Bell pit. From the Dunton gem quarry and the rose quartz crystal area, fluorapatite often occurs as a core of dark colored mineral that is coated with a thin film of carbonate-apatite.

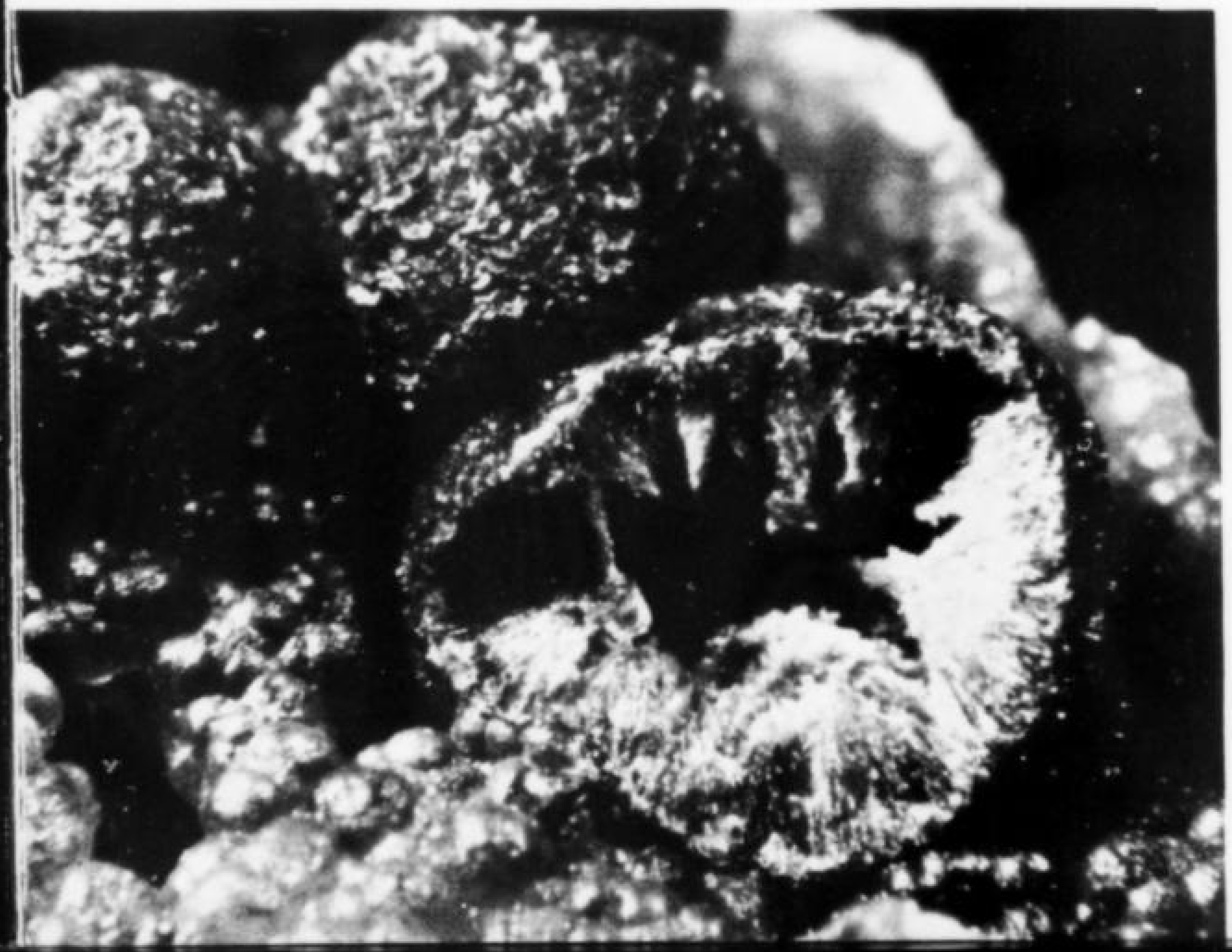
Eosphorite

Eosphorite has been found as radiating groups of crystals as well as in parallel to sub-parallel groups. Lone crystals are unusual. The color ranges from light golden brown to dark brown-black, although the usual color is chestnut brown. The luster is vitreous to earthy depending on the degree of alteration. The crystals are usually less than 4 mm, but some of the largest North American eosphorite

Fig. 14. **Pseudohexagonal roscherite (1 mm). Dunton gem quarry.**

Fig. 15. **Pseudo-orthorhombic roscherite (1 mm). Dunton gem quarry.**

Fig. 16. **Roscherite showing internal structure on hydroxyl-herderite (4 mm). Dunton gem quarry.**



is from Newry. Black mountain in Rumford, Maine, claims the former world record of 37 mm, but this has been recently surpassed by Brazilian specimens. A chalky-white fibrous mineral that yields the powder pattern of eosphorite has been found at the rose quartz crystal area.

Fairfieldite

This mineral occurs as white rosettes of thin platy crystals and as wheat-sheaf groupings. The best crystals from Newry are found at the Nevel and Bell exposures. Here they are tabular, simple rectangular, and are grouped in fan-shaped clusters resembling stilbite.

When clean and unaltered, the crystals are snow-white and the luster is waxy. The groups are usually 1-4 mm, but groups 20 x 20 mm have been observed. Until the recent discovery of the superior fairfieldite from Kings Mountain, North Carolina, Newry had produced the best crystals of this species.

Wardite

Wardite has been found as white, pseudo-octahedral bipyramids at the Dunton gem quarry. It is associated with fairfieldite, hydroxyl-herderite, and cookeite. The crystals are striated parallel to {001}. Bell pit wardite is highly lustrous and forms nearly spherical aggregates of complex crystals. The associated species are eosphorite and siderite.

The crystals are about 1-2 mm. This mineral is rare at Newry and is known in only a few examples.

GROUP 1b

Mineralogically, the most interesting associations are those of beryllonite.

Beryllonite

Crystals of beryllonite are rare. The mineral occurs as large tabular masses frozen in cleavelandite. "Watermelon" elbaite is almost always associated. (The name watermelon-tourmaline reputedly originated with George Howe during the last century while he was examining concentrically zoned red and green Mt. Mica specimens) (Shaub, 1960)

Palache and Shannon (1928) report that beryllonite alters to fibrous herderite (sic), sometimes to cavernous pseudomorphs. Beryllonite is cream-white to colorless, has a perfect basal cleavage and a less perfect orthopinacoidal one, and has numerous fluid inclusions. The crystals are tabular. Alteration of beryllonite develops a fibration normal to the crystal flattening. Because the crystals are imbedded in cleavelandite, they have vague outlines. The largest crystal mass was 8 x 5 x 4 cm.

Hydroxyl-herderite

Hydroxyl-herderite occurs as botryoidal groups of an amber color. The luster is waxy and the color ranges from white to brown in its extremes. Botryoids to 5 mm have been observed. This mineral is intimately associated with beryllonite and is occasionally found in group 1a matrix. It coats the beryllonite masses as well as the solution vugs inside. As stated previously, this mineral is a hydrothermal alteration product of beryllonite. The surface of the botryoids is generally smooth. Internally they show a radial fibrous structure.

Crystals of this mineral are rare at Newry. Yedlin (1972) describes the crystals as "somewhat equant". Several supposed hydroxyl-herderite crystals that have been shown to the author are, in his opinion, other minerals.

It should be noted that hydroxyl-herderite is a different species from herderite. There is more hydroxyl than fluorine in hydroxyl-herderite. Except for herderites from known fluorine-rich pegmatites, especially those with topaz, it is probable that most of the herderite found is actually hydroxyl-herderite. The chemical analysis of the Newry mineral by Palache and Shannon (1928) shows it to be hydroxyl-herderite.

***Fig. 17.* Acicular uralolite (2 mm). Dunton gem quarry.**

***Fig. 18.* Triphylite crystal in muscovite (6 mm). Nevel quarry.**

Some confusion has arisen with regard to this mineral. Particularly, spherical cream-white hydroxyl-herderite has been erroneously called "baseball beryllonite". Carbonate-apatite botryoids and another unknown botryoidal mineral have also been referred to by this name.

Roscherite

Next in this paragenesis is roscherite. Newry has several different habits of roscherite which all yield similar x-ray patterns. At the Dunton gem quarry, roscherite is almost always associated with hydroxyl-herderite. It usually occurs as dark brown botryoids that have a rough surface of sub-parallel crystals. Internally, the botryoids are radially fibrous and are silky in luster. The fibers can be individuals rather than botryoidally grouped. Occasionally, roscherite is altered to an earthy appearance. The very dark brown color is diagnostic at this locality when considered with the internal structure and rough surface. Some roscherite botryoids are hollow and this is the only botryoidal Newry mineral to be so.

The other habits include tiny, thin-tabular, pseudo-orthorhombic crystals and simple, stout, pseudohexagonal forms. These two habits are rare and have been observed but once each from the Dunton gem quarry. The color of these is red-brown.

A variation of habit is found at the rose quartz crystal area. Here, unmodified pseudotetragonal forms are seen. The color is brownish-green.

The crystals are usually less than 1 mm, while botryoids may exceed 5 mm each and groups may be 50 mm across.

Lindberg (1958) has shown that the botryoidal Newry roscherite is iron rich.

(Note: An unusual mineral has been found at the Nevel quarry. It is purple, tetragonal with steep termination, and is found as minute crystals associated with botryoidal roscherite. It was found in 1941 by Neal Yedlin and no new specimens have been reported. Collectors who have specimens of this material would advance the knowledge of this mineral greatly by sending any sample, no matter how small, to Mr. Yedlin, 129 Englewood Drive, New Haven, Conn. 06515 as he is having this material investigated.)

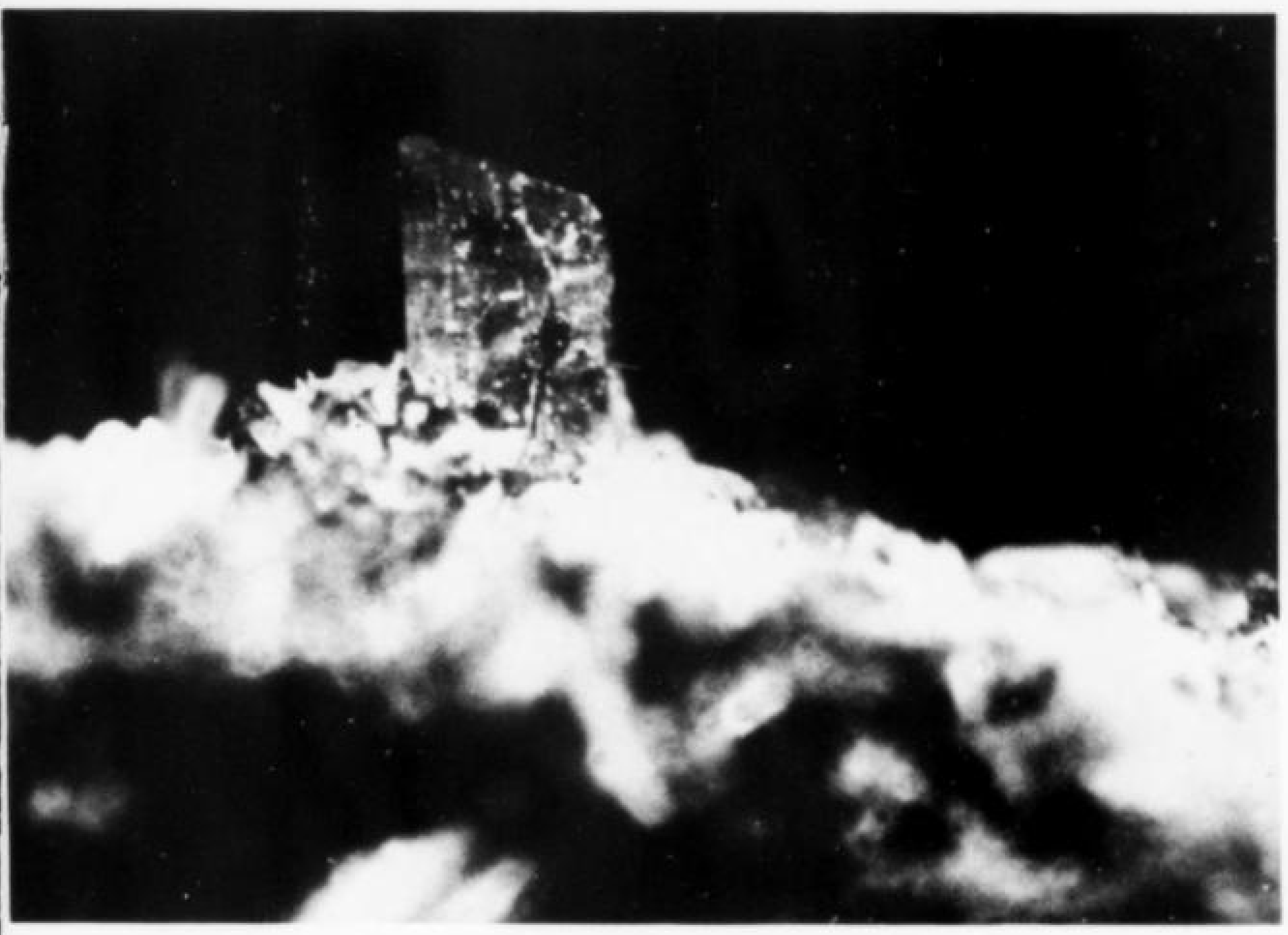


Fig. 19. **Laueite. Dunton gem quarry.**

Moraesite and Uralolite

These are the latest of the beryllium phosphates at this locality. The crystals are acicular and can be found as standing radiating sprays or matted coatings. They are snow-white and almost always found with hydroxyl-herderite, roscherite, or wardite. The luster is silky to vitreous and the aggregates are less than 5 mm.

Uralolite has been found at the Dunton gem quarry by Pete Dunn of the United States National Museum of Natural History. Although moraesite resembles uralolite, a green fluorescent response may be enough to characterize uralolite from moraesite at this locality.

As these beryllium phosphates are intimately associated alteration products of beryllonite, it is obvious that their availability is governed by the supply of beryllonite. The mining for elbaite has recently uncovered numerous specimens. Several typical specimens have been deposited with the National Museum.

GROUP 2a

Triphylite and lithiophilite are found at various localities in Maine, but few have produced both species. For the most part, triphylite is blue-gray, blue-green, or greenish-gray and, for the most part, lithiophilite is some shade of red-brown, grading to greenish-gray. They both possess distinct cleavages.

The bulk of the material at Newry appears to be triphylite. At the Nevel quarry, 7-12% of one intermediate zone is composed of triphylite. Most often, the triphylite is found in irregularly shaped grains up to 15 cm. Sharp crystals of this mineral have been found occasionally.

Many minerals are derived from the alteration of triphylite-lithiophilite. This alteration is of two types. Both are described in volume II, Palache, et al (1951).

By weathering and, in some cases, hydrothermal alteration, triphylite will have a brown ferrisicklerite coating which, on continued attack, becomes a pseudomorph composed of purple heterosite. Similarly, lithiophilite alters to brown sicklerite which can eventually be altered to purple purpurite. The ratio of iron to manganese does not usually change much from that of the parent mineral to the alteration product. For this reason, one would not expect to find purpurite at a triphylite location or heterosite at a lithiophilite location. It is not possible to distinguish heterosite from purpurite visually.

Stewartite

The stewartite group of minerals resemble each other in composition and form. Stewartite is triclinic, bladed, and the termination is generally quite steep, although some stewartite may resemble laueite. (Curt Segeler, personal communication)

The crystals are striated parallel to the long dimension. The only Newry stewartite that the author has seen is in the collection of the late Philip Foster. These crystals are in heterosite-purpurite matrix and are earthy due to alteration. Fresh stewartite should be vitreous. The crystals are 2 mm.

Laueite

Laueite is also triclinic, bladed, and striated parallel to the elongation. A feature distinguishing most laueite from stewartite is a generally more orange color and shallower termination. Many early "stewartite" identifications may be laueite, as laueite was undefined previous to 1954. Laueite is vitreous and usually less than 2 mm.

Strunzite

This is the easiest of the three minerals to find and identify. The crystals of strunzite are acicular and the color is straw yellow. At the Bell pit the mineral is found on siderite. The Dunton gem quarry strunzite is found in vugs in heterosite-purpurite as well as on siderite.

The crystals are sub-vitreous and are grouped so that they radiate from a common center. Randomly oriented crystals are also found. Some crystals show a splintery appearance.

The association of strunzite with altered triphylite and of similar appearing moraesite with altered beryllonite should be enough to rule out any confusion between the

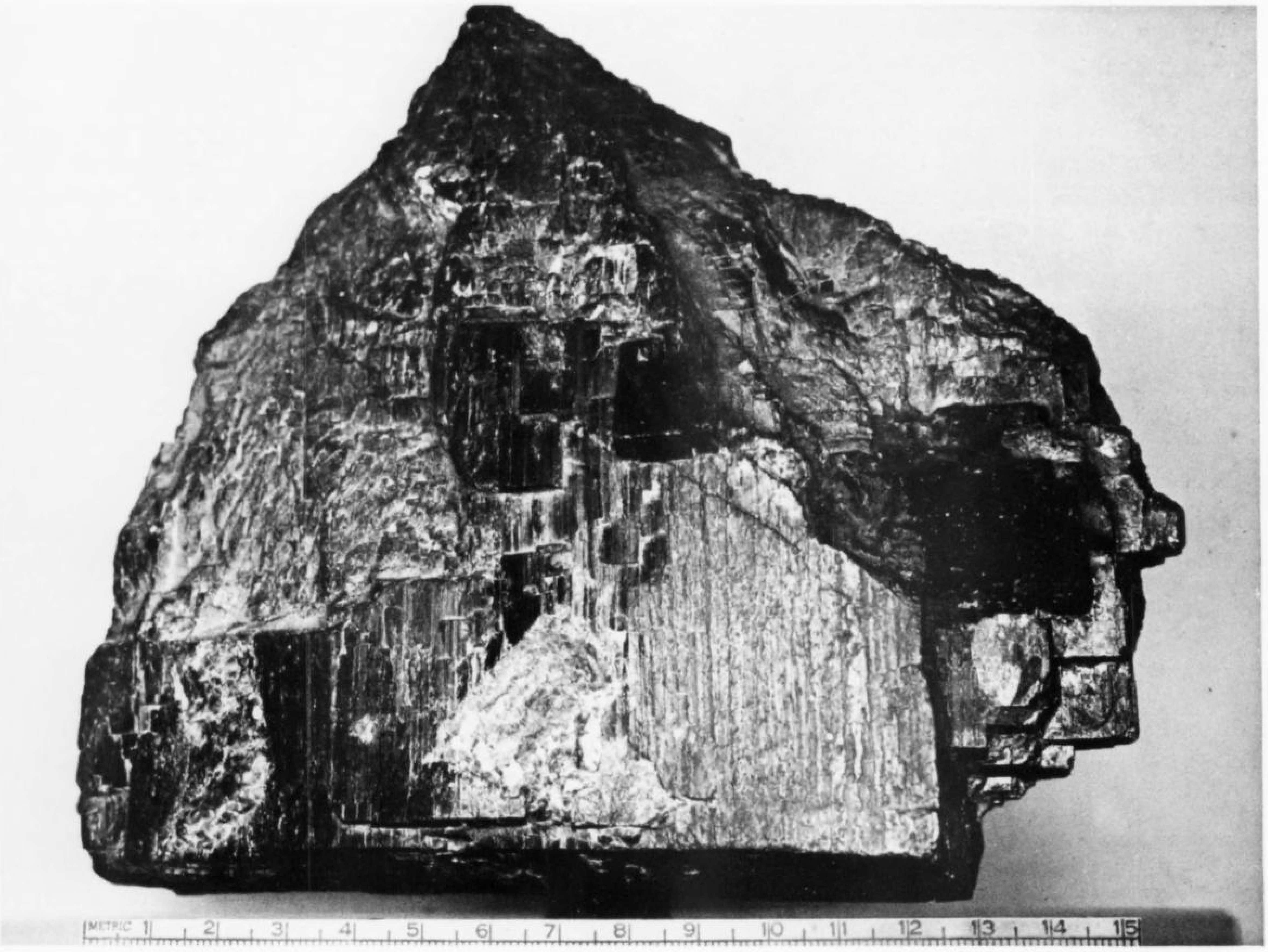


Fig. 20. **Columbite. Bell pit. Woodman collection.**

two. Color and luster also appear consistent in these species.

Vivianite

Vivianite has been reported often from the Dunton gem quarry, but few specimens have proven to be such. Vivianite crystals are dark blue. Broken surfaces exhibit a perfect, pearly cleavage. This mineral has been found in relatively fresh triphylite and sometimes in cleavelandite.

Elbaite and triphylite have been erroneously identified as vivianite at Newry. Somewhat altered elbaite lines many vugs in cleavelandite at the Dunton gem quarry. This material does not show crystal outline and has been called vivianite but the two are quite distinct.

Crystals of vivianite from Newry seldom exceed 1 mm although specimens are known to exceed 1 cm. Vivianite seems to be a scarce mineral at Newry.

Diadochite

This mineral is associated with altered triphylite or with autunite. Diadochite is red to red-brown and is found in botryoids which have a resinous luster and no internal structure.

Xanthoxenite

The literature is burdened with minerals that are called xanthoxenite. Recent work indicates that the Newry xanthoxenite is an oxidized, highly substituted phase of the jahnsite structure-type (Paul Moore, personal communication).

Xanthoxenite is yellow-brown and has a waxy luster. The crystals occur in 1 mm clusters in much altered triphylite-lithiophilite. Xanthoxenite is striated and resembles jahnsite in form. Bermanite is sometimes an associated mineral.

GROUP 3

The third group consists of minerals that are found in amblygonite-siderite-quartz matrix at the Bell pit. This quarry has supplied large specimens in addition to the unusual microminerals. Specimens of sharp, steep-scalenohedral siderite to 3 cm; large matrix specimens of tiny lilac fluorapatite, and a columbite crystal up to 18 cm have been found. The best collecting is that offered to people interested in microminerals. The mineral suite resembles that of the Palermo #1 quarry, North Groton, New Hampshire.

In addition to the minerals described in this section, the following species have been found as good crystals: brazilianite, eosphorite, fairfieldite, strunzite, ludlamite, amblygonite, and several as yet unidentified minerals. In addition, the Bell pit is a recently discovered location

Fig. 21. **Pseudocubic goyazite (1 mm). Bell pit.**

for the new species jahnsite. Specimens of this mineral have been deposited in the National Museum collection.

Jahnsite

Jahnsite is found as nut-brown and red-brown, deeply striated crystals associated with fairfieldite. Though monoclinic, the crystals are pseudo-orthorhombic. Individuals are rare at this locality and the most common habit is a cluster of sub-parallel crystals. Groups are 1-2 mm (see Moore, 1974).

Goyazite

Goyazite, a strontium mineral, is one of the more unusual phosphates at the Bell pit. Strontium seldom occurs in a large enough concentration to be an important element in pegmatite minerals.

The crystals are trigonal, but are pseudo-cubic in habit. The luster is vitreous to pearly, but some crystals are etched to give a frosted surface. There is a good basal cleavage. The crystals are seldom larger than 1 mm. Svanbergite was proposed as the identity of this mineral on the basis of an incomplete chemical analysis, but Yedlin (1970b) reports this material is goyazite, based on its x-ray pattern.

Whitlockite

Another trigonal mineral from the Bell pit is whitlockite. The crystals are complex rhombohedra that may superficially resemble monoclinic bipyramids. The mineral is usually 1-2 mm in size and its luster is adamantine to frosted. There is no cleavage. Some wardite identifications from the Bell pit appear to have been whitlockite.

Unidentified minerals

Small quantities of a most unusual mineral have been found with ludlamite and siderite at the Bell pit. The mineral crystallizes as spherical aggregates with individual acicular crystals extending out of a mass. Whitmoreite is what New Hampshire collectors formerly called "water mines" from the Palermo #1 quarry in North Groton, New Hampshire. The color of whitmoreite is golden brown and the luster is vitreous.

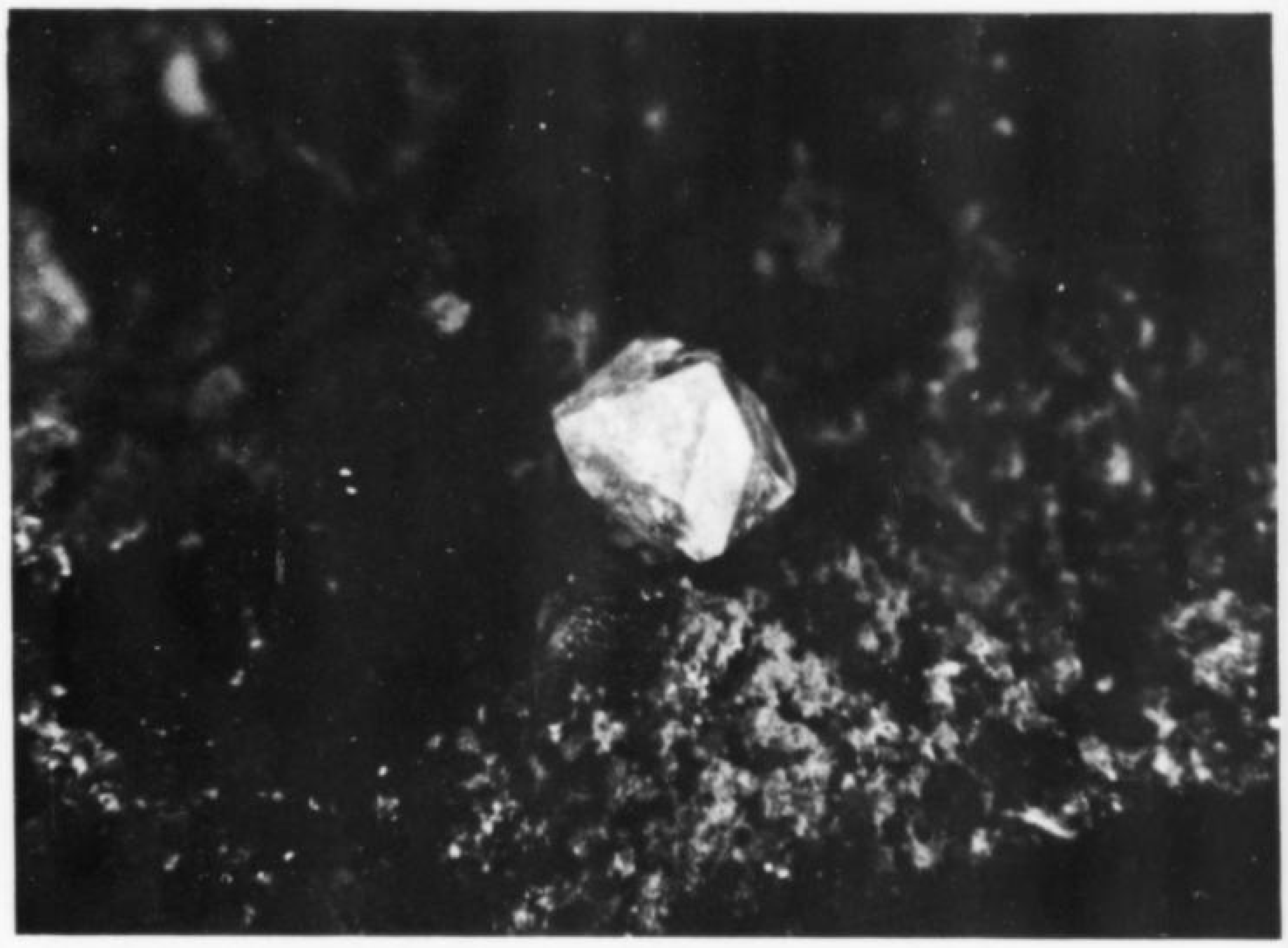


Fig. 22. **Complex whitlockite rhombohedron (1 mm). Bell pit.**

Conclusion

There are many other species found at Newry than are described here. Space does not permit describing them all, but most of those remaining should pose no identification problems. It should be kept in mind that the majority of these rare minerals exist only as microcrystals, and some of these have been observed in but few specimens.

The number of species that can be found at Newry is, at present, 111. This number of species ranks very high among the noted localities of the world. Future work should increase this total significantly. When these sites them all, but most of those remaining should pose no are again open to the public, Newry should be on the itinerary of the serious mineralogist.

Acknowledgements

This article has been a long time in its preparation and could not have come about had it not been for the help of many people. Particular thanks are due to Roger Clapp, Effe Gray, and the late Philip Foster who spent many hours with the author while discussing Newry and its specimens.

The author is indebted to Pete Dunn, Charles Cinnamon, and Paul B. Moore for their help in x-raying species

that had been sight identified. Cinnamon and David Seaman provided useful comments on the manuscript of this paper.

The author gratefully appreciates the cooperation given by Dean McCrillis, Dale Sweatt, and Robert Brown of the Plumbago Mining Corporation in allowing the author to inspect many of their specimens and in allowing photographs to be taken of the new workings.

REFERENCES

BASTIN, E. (1911) Geology of the pegmatites and associated rocks of Maine. *U.S.G.S. Bull.* **445**.

BJAREBY, G. (1964) Fifty years of mineral collecting, part 6. *Rocks and Minerals*, **39**, 353.

__________(1955) World news on mineral occurrences. *Rocks and Minerals*, **30**, 479.

CAMERON, E. N., D. M. LARABEE, A. H. McNAIR, J.J. PAGE, G. W. STEWART and V. E. SHAININ (1954) Pegmatite investigations 1942-1945, New England. *U.S. G.S. Prof. Paper* **225**.

FAIRBANKS, E. E. (1928) The importance of pollucite. *Amer. Mineral.*, **13**, 21.

FEDERATION OF MAINE MINERAL AND GEM CLUBS (1973) *Guidebook I to mineral collecting in the Maine pegmatite belt.*

FRASER, H. J. (1930) Paragenesis of the Newry pegmatite, Maine. *Amer. Mineral.*, **15**, 539.

FRONDEL, C. (1949) The dufrenite problem. *Amer. Mineral.*, **34**, 513.

__________(1956) Mineral composition of gummite. *Amer. Mineral.*, **41**, 539.

HURLBUT, C. S. (1950) Childrenite-eosphorite series. *Amer. Mineral.*, **35**, 793.

LINDBERG, M. L. (1958) The beryllium content of roscherite from the Sapucaia pegmatite mine, Minas Gerais, Brazil, and from other localities. *Amer. Mineral.*, **43**, 824.

MAINE DEPARTMENT OF INDUSTRY AND COMMERCE (1957) *Maine pegmatite mines and prospects and associated minerals.* Minerals Resource Index **1**.

McCRILLIS, D. (1975) Gem tourmaline rediscovered at Newry, *Mineral. Record*, **6**, 14.

MOORE, P. B. (1973) Pegmatite phosphates: descriptive mineralogy and crystal chemistry. *Mineral. Record*, **4**, 103.

__________(1974) I. Jahnsite, segelerite and robertsite, three new transition metal phosphate species. II. Redefinition of overite, an isotype of segelerite. III. Isotypy of robertsite, mitridatite, and arseniosiderite. *Amer. Mineral.*, **59**, 48.

__________, A. R. KAMPF and A. J. IRVING (1974) Whitmoreite, $Fe^{+2}Fe_2^{+3}(OH)_2(H_2O)_4(PO_4)_2$, a new species: its description and atomic arrangement. *Amer. Mineral.* **59**, 900.

MORRILL, P. (1958) *Maine mines and minerals, volume I.*

PALACHE, C., H. BERMAN and C. FRONDEL (1951) *Dana's system of mineralogy,* volume II.

PALACHE, C., W. E. RICHMOND and C. W. WOLFE (1943) On amblygonite, *Amer. Mineral.*, **28**, 39.

PALACHE, C. and E. V. SHANNON (1928) Beryllonite and other phosphates from Newry, Maine. *Amer. Mineral.*, **13**, 392.

PEACOR, D. R. (1960) Mineralogy of pegmatites of the Newry Hill area, Maine, trip E. *Guidebook for the 52nd annual meeting of the New England Intercollegiate Geological Conference*, 33.

POUGH, F. W. (1960) *A field guide to rocks and minerals.*

SHAININ, V. E. and L. F. DELLWIG (1955) Pegmatites and associated rocks of the Newry Hill area, Oxford County, Maine. *Maine Geological Survey Bull.* **6**.

SHAUB, B. M. (1950) On the origin of some pegmatites in the town of Newry, Maine. *Amer. Mineral.*, **35**, 673.

__________(1960) Notes on the Dunton gem quarry, Newry Hill, *Yearbook of the Oxford County Mineral and Gem Association*, reprinted 1973, p. 3.

STEVENS, J. P. (1972) *Gems and Minerals of Oxford County.*

SWANSON, N. (1955) World news on mineral occurrences. *Rocks and Minerals*, **30**, 583.

TRAPP, F. (1973) Giant tourmaline strike. *Rock and Gem*, **3**, 8.

VERROW, H. J. (1940) Minerals from Newry, Maine. *Mineralogist*, **8**, 51.

WADE, W. R. (1909) The gem bearing pegmatites of western Maine. *Eng. Mining J.*, **87**, 1127.

YEDLIN, L. N. (1965) The micromounter. *Rocks and Minerals*, **40**, 673.

__________(1970a) Yedlin on micromounting. *Mineral. Record*, **1**, 91.

__________(1970b) Yedlin on micromounting. *Mineral. Record*, **1**, 138.

__________(1972) Yedlin on micromounting. *Mineral. Record*, **3**, 36.

WORLD OF MINERALS, 1976, OTTAWA, CANADA

The Ottawa Lapsmith Club wishes to announce that the Club has been chosen to host the 1976 Annual Exhibition of the Central Canadian Federation of Mineralogical Societies (CCFMS).

The theme of the 1976 Exhibition will be World of Minerals and it is our hope to have displays of mineral and lapidary material from many countries.

The exhibition will be held in Ottawa on July 9, 10 and 11, 1976, at the Geology Department of Carleton University. The dates, which are shortly before the opening of the Olympic Games in Montreal, and also before the well-known Bancroft Gemboree, will doubtless find many travellers in the nation's capital. There will be a number of dealers offering rough and finished material for sale as well as over one hundred displays provided by local embassies, museums, government departments, member clubs and individuals, both of the CCFMS and of the American Federation of Mineralogical Societies.

July 9, 10, 11, 1976, Ottawa, Ontario, Canada—Central Canadian Federation of Mineralogical Societies Exhibition, Carleton University - Dealers - Hours: Friday 6 PM to 10 PM, Saturday 10 AM to 10 PM, Sunday 10 AM to 6 PM. Chairman: J. D. O'Conner, Box 69, Cumberland, Ontario KOA 1S0, Canada.

FM RECOGNIZES B.E.S.T. EARTH SCIENCE TEACHERS

The National Association of Geology Teachers (NAGT), through individual regional subcommittees, selects an outstanding Earth Science Teacher within the secondary school system in each NAGT Section of the United States every year. The winners are honored at the Annual National Science Teachers Association meeting as well as in their regional meetings.

This spring twelve earth science teachers were chosen for the B.E.S.T. (Best Earth Science Teacher) Awards. In further recognition of their excellence in earth science teaching, Friends of Mineralogy (FM) has contributed a one year's subscription to the *Mineralogical Record* to the twelve teachers who were chosen. This project was developed by Robert W. Jones, past chairman of FM's Education Committee.

National Mineral Collection Supports Research

by Pete J. Dunn

Department of Mineral Sciences
Smithsonian Institution
Washington, D.C. 20560

The mineral collections of the National Museum of Natural History, Smithsonian Institution, Washington, D.C., are very extensive and are among the largest in the world. These collections are readily available to, and used by, the scientific community for worthwhile research. The museum maintains, in addition to the National study and exhibit collections, a repository for *type* and *described* mineral specimens, i.e.-those from which data have been gathered, and usually published. The *type* collection presently contains over 500 mineral species and is continually growing. The number of *described* mineral specimens presently exceeds 4,700 specimens. There are reasons why we should all be concerned about the preservation of minerals for which analytical data of any form exists. A major one is that the data become far less significant if the specimens are lost for they cannot be verified, amended, or enhanced by subsequent, perhaps more sophisticated, studies.

Far too often minerals described in published papers are deposited in drawers or cabinets by the authors and subsequently forgotten. With the passage of time and continual shifting from place to place, such specimens are usually lost to science. This loss, though unintentional, is an irresponsible disservice to our science. Unfortunately, failure to properly dispose of described specimens is the rule rather than the exception. This should be changed for the betterment of mineralogy.

Just as it is important to publish our research and disseminate knowledge, so also is it important to see to it that the specimens involved are preserved. Repositories of described specimens should continue to grow in depth and quality to the advantage of all who study minerals. Authors are, therefore, asked, and strongly encouraged, to send all analysed or otherwise described mineral specimens to the Division of Mineralogy, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560. Acknowledgement of receipt will be by letter, and the specimens will be carefully curated. In turn, the museum will continue to do its best to furnish research materials to the scientist upon written request.

We ask you, the responsible research mineralogist, to help us to continue building the U.S. National Mineral Collection so that it will be an even greater asset to the generations who will follow us. Please cooperate and do so today. A photocopy of this page in a prominent place will be a helpful reminder. Thank you.

Fig. 1. **The William Tell monument in Altdorf.**

Mineral Shows in Switzerland

by *Esther Gamma* **6460 Altdorf-Uri Switzerland**

Each year, there are over a dozen Mineral Shows throughout Switzerland; most of them, however, having come up only recently, since mineral collecting has also become a popular hobby in Switzerland.

One of the oldest and most important shows is the Zurich Mineral Show, each year in November, which surpasses all others with regard to the number of dealers (mostly over 300) and visitors.

Fig. 2. **The 1974 Mineral Show in Altdorf.**

The second-largest is the Mineral Show of the "Schweizer Strahler-und Mineralien-sammler-Vereinigung", also held in the Autumn, alternating in different cities throughout Switzerland. The actual show is only on Sunday, while the Saturday before is dedicated to the club-meeting and to various speeches.

A very important show, outstanding with regard to its family-like atmosphere and the material presented, is the Mineral Show of Uri ind Altdorf, a medium sized country town in the heart of Switzerland and famous for the story of the Swiss national hero, William Tell. The show is held annually over the first week-end of September - this year it will be the 6th and 7th - and has been frequented many years by American dealers; for example Si and Ann Frazier of Berkeley, California, Tom Warren of the ULTRA VIOLET PRODUCTS of San Gabriel, California, and the Canadian dealer Prosper Williams of Toronto. This year also Herbert Obodda of Short Hills, New Jersey, will take part as a dealer and exhibitor with some fabulous fluorites. There might be some other well-known U. S. dealers coming, as several have shown interest in participating. The number of dealers for the Altdorf Show is limited to about 130, due to the lack of space and to enhance the outstanding quality to be presented.

One of the differences between the Swiss and the U. S. shows is the too commercial appearance of the Swiss shows, where award-winning exhibits, as well as participation of museums, are practically unknown. Also, there is no difference between wholesale and retail; prices are made freely, according to offer and demand. The Mineral Show in Altdorf has started to dedicate a special exhibit to a specific mineral each year. At the forthcoming show in September, the honor goes to hematite - with famous iron roses found in the Gotthard area - and colorful fluorite. However, awards will be presented only for the display at the sales stands, considering quality, presentation and clear marking of the selling material. There will be a separate valuation for the alpine minerals and minerals in general. As mentioned, museums don't take part in the exhibits and so it is completely up to private collectors, dealers and members of the "Urner Mineralienfreunde" to give the Altdorf Show a more idealistic aspect.

The Record Bookshelf

The Wakabayashi Mineral Collection
by R. Sadanaga and M. Bunno, University Museum, University of Tokyo, Bulletin #7, 177 pp, 131 fig, 16 color plates, 1974.

Dr. Yaichiro Wakabayashi (1874-1943) was an outstanding mining engineer with the Mitsubishi Company, Ltd. who donated his mineral collection of almost 3000 selected specimens to the University of Tokyo in 1934. The collection has since been the object of intensive study by Professor Ito and his students and is thus one of the definitive collections of Japanese minerals. This exemplary monograph specifically describes 1,932 specimens representing 182 species in the Wakabayashi collection.

The mineral descriptions are arranged according to Dana's system and follow a standard format. The name, composition, crystal system and space group are tabulated for each species and the number, locality, mode of occurrence and crystal habit are recorded for each specimen. A typical entry reads:

> Linarite, $PbCu\{(OH)_4|(SO_4)\}$, Monoclinic, $P2_1/m$ <Specimens No. VI-77 - No. VI-99> Specimens No. VI-82 - No. VI-98, from the Kisamori Mine, Akita Pref., occurs as secondary mineral in fractures of oxidized ores in an epithermal copper-lead-zinc deposit, and form groups or aggregates of small crystals tabular or prismatic with *m*(110), *b*(010), *a*(100), $u(\bar{2}01)$ and $s(\bar{1}01)$. They are deep blue to cobalt blue with glassy lustre, and up to 2 cm in length. Associated secondary minerals are malachite, cerussite and pyromorphite (Plate 11).

The text is well illustrated with color plates, photographs, and line drawings. Illustrated specimens of chamosite, chalcopyrite, inesite, scheelite, and veszelyite are particularly choice. Among the many fine crystal drawings, those of chalcopyrite, danburite, scorodite, topaz and vesuvianite deserve special notice. Several useful indexes supplement the text including a bilingual localities list.

Catalogues of the world's important mineral collections are rarely published unlike the case of comparable collections of art, coins, jewellery, et cetera. Imagine the pleasures that would accrue from owning catalogues of such famous collections as the Roebling collection, the Canfield collection, and the Bosch collection! Certainly the literature of descriptive mineralogy would be far richer if all major collections were as well described as the Wakabayashi collection.

Carl A. Francis

TITLE ONLY

Handbook of Geochemistry. Vol. II/4. **Edited by K. H. Wedepohl, et al. Springer-Verlag New York, Inc., 175 Fifth Avenue, New York, NY 10010. 1974, pages unnumbered. ($122.20)**

Philosophy of Geohistory, **edited by Claude C. Albritton, Jr., Halstead Press (a Division of John Wiley & Sons, Inc.), 605 Third Avenue, New York, N.Y. 10016 (1974). 386 pages. ($24.00)**

Geochemistry of Iron, **edited by Henry Lepp, Halsted Press, (A Division of John Wiley & Sons, Inc.), 605 Third Avenue, New York, N.Y. 10016 (1975). 464 pages. ($28.00)**

Metamorphic and Plate Tectonic Regimes, **edited by W. G. Ernst, Halsted Press, (a Division of John Wiley & Sons, Inc.), 605 Third Avenue, New York, N.Y. 10016 (1975). 440 pages. ($30.00)**

To the Editor

CALL FOR HELP

Dear Sir:

Although there has been some consternation in some of the recent issues of the *Mineralogical Record* as to its becoming too professional, I was wondering if I could enlist your help and the help of all the readers for a professional endeavor. I am attempting to prepare a paper on chromium micas, and I am trying to collect as many samples of chromian muscovite, mariposite, and fuchsite as possible for study. The specimens must be large enough to make a thin section from them and there must be enough chromium mica in the remaining specimen so that I can extract at least 1 gram, preferably more, from each for analyses. It is imperative that I know the exact location of each specimen. Also, if possible, any information concerning the associated lithologies and local geological terrain would be of great value.

I am requesting your help because you know how long it would take me to write to all the museums and research institutions in the world to request study material. By publishing my request in the *Mineralogical Record*, I not only reach the various institutions, but all of the "amateur" mineralogists who in some instances would be difficult to contact. Here certainly is an example of an instance where amateur mineralogists could be of great assistance to the advancement of mineralogy.

John H. Grimes
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NOT ARBITRARY

Dear Sir:

I have your review of the *Encyclopedia of Minerals* (*MR*, vol. 6, p. 41). What caught my attention was your list of "errors", where the mineral names used by the authors went against the recommendations of the IMA.

May I ask why the IMA arbitrarily chose the names it did? Few of the recommended names are familiar to me, while nearly all the "disapproved" names are. It seems really ridiculous to throw out names that have been in use for so long. I don't care what the IMA says - the name sphene has a lot more class than titanite.

Gretchen Luepke
Menlo Park, Calif.

There was nothing arbitrary about the judgements of the IMA in the matter alluded to by reader Luepke. The history of the nomenclature, in each case that was decided, was carefully researched. According to the rule of priority, those names that were satisfactorily demonstrated to have been the first to appear in usage were chosen by the IMA as the names that should now be used. The IMA can only recommend this usage, it has no authority to enforce it. In the interest of simplifying and clarifying mineralogical nomenclature, it is very important that we try to follow these recommendations. Personally I too prefer sphene but I will always make an effort to use the name titanite. Ed.

EXCHANGE

Dear Sir:

I am a collector of minerals and I like to come in contact with colleagues for exchange. I have many minerals in crystals from Italy, Jugoslavia, Rumania and Greece. I hope you will place my request in the *Mineralogical Record*.

P. Bruno Scortecci
Via Erbosa, 15
52100 Arezzo
Italy

COVERS

Dear Sir:

Regarding the cover of *Mineralogical Record*, vol. 6, no. 2; that was certainly a fine specimen of elbaite, definitely worthy of appearing on the cover of your magazine. However, I have one complaint. I feel that the cover photo (or drawing) should represent one of the articles covered in the magazine. Perhaps a photo of a six inch barrel hanksite crystal would have been more approprate, or a specimen of colemanite and calcite crystals replacing ulexite, or a group of rockbridgeite blades with hureaulite. Being a native of Trona, California, I would have personally preferred a photo or drawing of a hanksite crystal on the cover of your magazine. Large specimens, as far as I know, occur in only one place in the world, Searles Lake, California. However, I would have preferred that the photo of elbaite wait until you feature an article on tourmaline or on the Pala district, California.

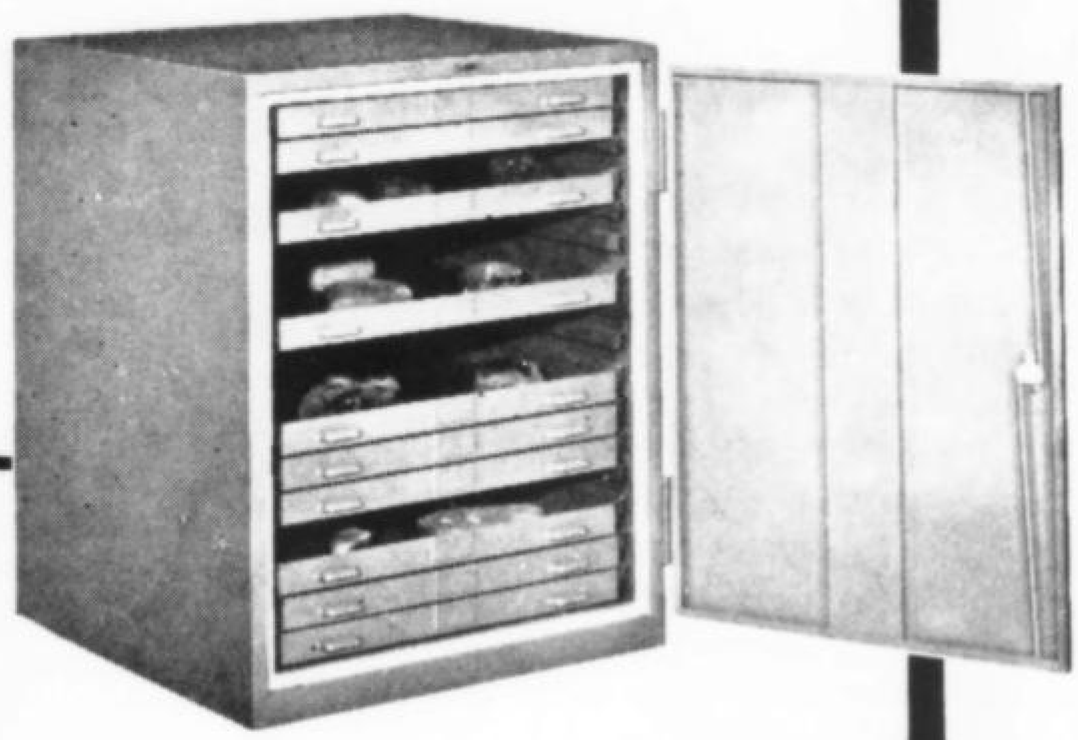
Harvey Eastman
Stanford, California

Unfortunately, we rarely have a cover quality color photograph that compliments a feature article or a feature article that compliments the cover for a specific issue. We are primarily interested in making the cover attractive and exciting in itself, the advance planning for which makes it difficult to coordinate with what is inside the magazine. Ed.

EXORBITANT PRICES

Dear Sir:

Just as we shop around when purchasing goods, as collectors we must continue to seek out the best specimens at the most reasonable prices.



Some dealers seem to be using the philosophy "ask for the moon and you might get a piece of it" when pricing mineral specimens.

In the past year I have been to and bought specimens at all the large shows held in the West (and many smaller ones). It is amazing to see different dealers vary in price as much as 100% on similar specimens. While no two minerals (even the same species) are identical there is much material so similar that the large dollar difference in their price is inexplicable. As one case in point, recently I have seen blue botryoidal hemimorphite from Mexico of nearly the same size (2x3), color, quality, matrix, etc. offered by different dealers for prices ranging from $3 to $10!! Now someone is making a fair profit and someone is asking an exorbitant price.

So I say, shop around, don't pay or accept high prices, question the dealer on his pricing, barter if possible.

Perhaps in these ways we can help hold prices in line and force those few dealers who are making an unfair profit to reassess their price structure. Remember they ask an unreasonable price because there are people willing and able to pay it.

Gary Carter
Saugus, California

I know of very few dealers who have excessive markups on their material. Mineral pricing is one of the most arbitrary and irrational things a merchant can be called upon to do. In nearly every case the retail price represents a standard markup over what the dealer has invested in the material. It is quite possible that two dealers did not pay the same thing for two essentially identical specimens. I know of many examples where dealers have sold material for less than they paid for it, so it all (hopefully) balances out. Ed.

APATITE OR QUARTZ

Dear Sir:

On page 235 of volume 5 I read two notes about the Onganja mine. Among other minerals are described "pale green apatite" (Kosnar) and "many apatites, the largest 1 to 1.5 cm, of a light green color" (Lammer).

I had the opportunity to get some material from this mine. I also have


COLEMANITE

found light green "hexagonal" prisms with pyramids. X-ray diffraction, however, showed that these crystals are quartz.

My question is, by what method were the apatites determined? Or are they only called apatites because of their "hexagonal" shape?

Gerhard Hentschel
Wiesbaden, Germany

A specimen has been supplied to me by Mr. Kosnar and the identification as apatite has been confirmed using optical methods. Ed.

PRIMARY MALACHITE

Dear Sir:

In the Q/A Column of vol. 6, p. 62, I take exception to the answer given to the question about "primary malachite."

Your answer implies that most malachite is pseudomorphous after some other mineral. I do not believe that this is true; most malachite is deposited as a crystalline or botryoidal crust filling open spaces in the zone of oxidation of mineral deposits, and only occasionally does it form pseudomorphs. As a matter of fact there is no reason why primary malachite could not exist, and it may well exist; simply, the proof of primary origin is not easy, and I do not know of anyone having studied the problem.

Copper ions have such a strong affinity for sulfide ions that where both are present in mineralizing solutions, one of the sulfides will invariably form rather than a carbonate. But when the sulfide ions are depleted, native copper may form, and probably many of the oxysalts as well, including malachite, cuprite, and certainly, kinoite. The Michigan native copper deposits testify to this on a large scale. However, metal-bearing solutions of the type which would give rise to primary copper mineralization, almost universally have an excess of $S^{=}$ ions; therefore, primary malachite, if it exists, will be rare.

Richard V. Gaines
Pottstown, Pennsylvania

ON CLOSED MINES

Dear Sir:

A re-reading of the guest editorial in the first issue of 1975 has prompted me to mention an important development at the Palermo mine, North Groton, New Hampshire. Not only has the "door" to this mine NOT been "nailed shut" but on the contrary it appears to have been opened wide to collectors for the foreseeable future. Early last year the mineral rights were bought by Forrest F. Fogg, Penacook, N. H. and Robert W. Whitemore, Weare, N. H. (foggite and whitmoreite were named in recognition of their interest which led to Dr. Paul B. Moore's studies and descriptions of these new phosphate minerals.

The mine will be open to collectors for a moderate fee.

W. Seward Mariner
New London, New Hampshire

LAST WORD (I HOPE)

Dear Sir:

If you are going to refer to the Viburnum Trend as "St. Joseph Lead District", it should be the NEW St. Joseph Lead District. It still remains, as Mr. Hansen pointed out, that the specimens that people collect and buy, for the most part, come from mines owned by other companies. The collector has a right to know where his fine specimens came from. The name Viburnum Trend includes all the mines.

The mine given as the localily for the pyrite bars should be written "AMAX-Homestake's Buick Mine". AMAX-Homestake is the mining company. Buick is the name of the mine. This may be picky, but Mr. Neulle's name was misspelled; the Buick mine is at Bixby, not Boss; and St. Louis was misspelled.

Elizabeth Holloman
Ironton, Missouri

We plead guilty to the spelling errors. In fact, reader Holloman missed one more. Missouri was also misspelled in **our** *version of Hansen's letter (vol. 6, p. 95-96). Ed.*

BOOKS

A rather long period has elapsed since I last issued a price list of mineral and gem books.

Soon I will issue the first number of a series that I will print regularly. When enough parts have been issued to form a volume they will be united with a general index. The arrangement will be, in most cases, alphabetical, which has the merit of presenting a varied interest. The several parts will include a good many titles of distinctive interest and unusual occurrence.

Regarding values of books about gems and minerals, I think the record shows the books to have been more stable recently than the items they describe. In a general way it could be said there have been no sensational advances or dizzy declines.

The lists will be issued free of charge to those requesting them.

Forecasting the future is always hazardous, and especially so in these times, but in this book field, I do not see any large quantities of desirable items coming on the market, whereas I do see continued demand. Libraries and institutions are constantly buying books and removing them forever from the market, making the available supply smaller and smaller each year.

* * *

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