

THE PICKING TABLE

All meetings will be held at the Bardonia School, Bardonia, New York. The meeting activities start at 1:00 P.M.; speaker announced at 2:30 P.M.

THE PICKING TABLE

Sunday, March 21st
Meeting - 7:30 P.M. Speaker - Dr. Paul Seel
on "The History of Micro X-ray"

Saturday, April 10th
Lunch meeting and field trip with the New Jersey Mineralogical Society

FRANKLIN OGDENSBURG MINERALOGICAL SOCIETY, INC.

May 15th
Meeting - 7:30 P.M. Speaker - Dr. John S. Albanese
on "The Lead Minerals of the Tarrytown"

Saturday, June 15th
Meeting - 7:30 P.M. Speaker - Dr. Kurt Nassau on
"The Nature of Color and Fluorescence in Minerals"

Field trips and meetings will be held on
Saturday - September 15th
Saturday - October 15th
Sunday - November 1st

P. O. BOX 146

FRANKLIN, N. J.

SPECIAL EVENTS

April 24th-25th
Earth Science and Ore Show of the Mineralogical Society of Pennsylvania - Germantown, Pa.
Schubert's Lane and Green Street, Philadelphia, Pa.
Saturday, 1 - 10 P.M. Sunday, 10 A.M. - 2 P.M.

June 2nd
Franklin Annual Day Speaker - 9:00 A.M. to 2:00 P.M.
Hazard Field, Franklin, N.J.

July 2nd
Annual Show of the Eastern Federation - New York City
500 Fifth Avenue

VOLUME VI

FEBRUARY 1965

NUMBER 1

October 2nd - 1965
Franklin Mineral Show sponsored by the Franklin Mineral Club, Franklin, New York, N.Y.

The PICKING TABLE is issued twice per year, a February issue to reach members about March 1st and the October issue to reach members about September 1st with news and the Fall program. The Picking Table is written and prepared by Frank E. Bunker, the mine and geology by Louis W. Ferguson.

CLUB PROGRAM - SPRING 1965

All meetings will be held at the Hardyston School, intersection of Routes #23 and #517, Franklin, New Jersey. Pre-meeting activities start at 1:00 P.M.; speaker announced at 2:30 P.M.

- Sunday, March 21st Field Trip 9:00 A.M. to Noon - Buckwheat Dump, Franklin, N. J.
Meeting - 2:30 P.M. Speaker - Mr. Paul Seel on "The History of Micro Mounting."
- Saturday April 10th Joint meeting and field trip with the New Jersey Audubon Society.
- Saturday, May 15th Field Trip - 9 A.M. to Noon - Open Cuts, Sterling Hill Mine, Ogdensburg, N.J.
Meeting - 2:30 P.M. Speaker - Mr. John S. Albanese on "The Lead Minerals of the Parker Shaft."
- Saturday, June 19th Field Trip - 9 A.M. to Noon - to be announced.
Meeting - 2:30 P.M. Speaker - Dr. Kurt Nassau on "The Nature of Color and Fluorescence in Minerals."

Fall Program Field trips and meetings will be held on
Saturday - September 18th
Saturday - October 16th
Sunday - November 21st.
- Details in the next issue of The Picking Table

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SPECIAL EVENTS recommended for your attendance.

- April 24th-25th Earth Science and Gem Show of the Mineralogical Society of Pennsylvania - Germantown Academy, Schoolhouse Lane and Green Streets, Philadelphia, Pa.
Saturday, 1 - 10 P.M. Sunday, 10 A.M. - 6 P.M.
- June 5th Fourth Annual Swap Session - 9:00 A.M. to 9:00 P.M.
Munson Field, Franklin, N.J.
- July 3rd, 4th, 5th Annual Show of the Eastern Federation - New York Trade Show Building, 500 Eighth Avenue, (at 35th Street) New York City.
- October 9th - 10th: Ninth Annual Mineral Show sponsored by the Franklin Kiwanis Club, Franklin Armory, Franklin, N.J.

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The PICKING TABLE is issued twice per year; a February issue to reach members about March 1st with news and the Club Spring program; an August issue to reach members about September 1st with news and the Fall program. The Picking Table is written and prepared by Frank Z. Edwards; the mimeo and typing by Louise W. Borgstrom.

F.O.M.S. OFFICERS FOR THE YEAR 1965

President	Frederick A. Kraissl
Vice President	Dr. Harry E. Montero
Secretary	Henry M. Althoen
Treasurer	Julian M. Butler

Trustees

John L. Baum '65	John Sebastian '66
Frank Z. Edwards '66	William D. Spencer '65
Alexander F. Knoll '65	Kenneth Sproson '66
Richard Hauck ('65 alternate)	

Committee Chairmen

Auditing	Paul Chorney
Awards	Richard Hauck
Display and Exhibit	John L. Baum
Field Trip	Henry M. Althoen
Franklin Information	Ewald Gerstmann
Historical -	Perry Armagnac and Mrs. E. Packard Cook
Identification	Alexander F. Knoll
Lapidary	Edmund Frey
Library and Audio Visual	- William Spencer
Membership	Dr. Harry E. Montero
Museum Coordinating	Edward G. Selems
Nominating	Frank Z. Edwards
Publicity	Kenneth Sproson
Safety	John Sebastian
Stores	Julian M. Butler

F.O.M.S. Administration

The same officers who provided such excellent leadership for the F.O.M.S. in 1964 were reelected for 1965. Messrs. Chorney and HasBrouck, who have served faithfully and well on the Board of Trustees and in other capacities, have been succeeded on the Board of Trustees by Messrs. Sebastian and Sproson, familiar faces to all members who attend meetings and field trips. President Kraissl has expanded the number of operating committees and several new names appear as committee chairmen.

Membership in our Society continues to increase. Jack Butler, Treasurer, reports close to the 600 mark. Cash balance on November 30th, 1964 was \$809.55; income and expenses for the year were almost equal, which worries Mr. Butler and has him looking for new sources of income. Before he again looks at dues, I would suggest you mail him your check for 1965, using the form on the last page of The Picking Table.

The F.O.M.S. Constitution

To add to his problems, Mr. Butler has had correspondence and an interview with the Collector of Internal Revenue regarding the Society's status as a non-profit organization. To properly qualify in this category several changes are necessary in our Constitution. Mr. Emanuel Honig, our attorney, has recommended that we prepare a revised constitution, (together with a summary of the changes or amendments) for submission to our membership for their vote and approval at our meeting of March 21st. A copy of the revised constitution is being forwarded with this issue of The Picking Table. Please read carefully; if you have any suggestions, please write promptly to Mr. Henry M. Althoen, Secretary, who is handling this matter. After the revised constitution has been approved, Messrs. Butler and Honig will be able to file the necessary forms with the Internal Revenue Service for exemption status.

Our Spring Program

Your attention is directed to the Calendar page. Please note that meetings will now be held at the Hardyston School, located at the intersection of Routes #23 and #517, Franklin, where we have occasionally met before. The facilities here are spacious and comfortable and we are extremely fortunate to have the use of such quarters for this year.

Our first meeting will again be held on a Sunday - the 21st of March. Other meetings will be held on Saturdays as usual. Our scheduled speakers are well known to all collectors and their topics well selected for variety and interest. Your attendance will be well rewarded. Field Trips will be held in the mornings. Full details of all events will be given in separate monthly mailings.

Our April meeting will again be held jointly with the New Jersey Audubon Society. On June 5th, the F.O.M.S. and the North Jersey Mineralogical Society will host the Fourth Annual Swap Session at Munson Field, Franklin.

Mineral shows always interest our members. This year three regional shows, well separated in time, are recommended for your attendance. Please refer to the Special Events section of our calendar page.

Museum Notes

Construction of the Franklin Mineral Museum is scheduled to start on March 15th. Financing of the project has been approved by the Peoples National Bank of Sparta and the construction contract awarded to Elg-Sandberg Co. The plans call for a large addition to the Replica Mine Exhibit on Evans Street in Franklin. This will provide considerable display room, a library, work area and entrance lobby.

Funds for operations are needed and public support is requested. Cash contributions may be sent to the Franklin Mineral Museum, Inc., Alfred B. Littell, Secretary, Franklin, N.J. or to F.O.M.S. Treasurer, Mr. J. M. Butler, Box 146, Franklin, N. J.

In addition to cash, the Museum is seeking gifts or loans of Franklin minerals, photographs, literature, mining relics or other display material. Arrangements for such loans or donations may be made through Mr. Ewald Gerstmann, 14 Walsh Road, Frankling, acting as F.O.M.S. committee chairman.

New Mineralogical Literature

A serious collector values his mineralogical literature as much as his specimen material. Recently several excellent books that belong on every collector's book shelf have been published. These include

Mineralogy for Amateurs by John Sinkankas	\$12.50
Gems, Minerals, Crystals and Ore (The Collector's Encyclopedia) by Richard M. Pearl	\$6.95
The Geology and Geography of New Jersey by Kemble Widmer (N.J. State Geologist)	\$3.95
Nature's Hidden Rainbows - Fluorescent Minerals of Franklin, N.J. by Robert Jones, Jr.	\$2.95

In a recent conversation with John Albanese, I learned that he still has a number of complete sets of his NOTES ON THE MINERALS OF FRANKLIN AND STERLING HILL, NEW JERSEY. These notes were eight issues of a journal, privately published by Mr. Albanese from October 1959 through July 1961. To me these Notes have been just as important as Palache; I consult both regularly. I have always felt that it was a great loss to the Franklin collector when John had to discontinue the publication of the NOTES. To find that copies are still available is good news. A complete set is priced at \$4.00, a real bargain.

As mentioned before, Jack Butler, our Treasurer, is always looking for ways in which to make an extra dollar for the F.O.M.S. He has now agreed to mail copies of the above literature to our members at the prices shown. Orders and accompanying checks should be sent to the F.O.M.S., Box 146, Franklin, N.J. These books will also be on sale at the Treasurer's desk prior to every meeting.

Miscellaneous Notes

Ewald Gerstmann announces that his Private Museum, 14 Walsh Road, Franklin, N.J. is now open to the public. This collection of Franklin material, one of the finest ever assembled, is beautifully housed and exhibited. Ewald's action in making it available to everyone is a generous gesture. Be sure to look at these wonderful specimens the next time you are in Franklin.

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Photography frequently is an interesting sideline for mineral collectors. An article in the March 1964 issue of the American Scientist by Professor Robert Colwell, University of California at Berkeley, discusses "New Camera Films and Lenses and Their Use in Geology and Geography." He states that "Geologists have found both color film and stereoscopic cameras invaluable aids in mapping rock formations and prospecting for minerals. The presence of mineral deposits is often marked by color or tonal changes in rock formations. Although these differences may not be great enough to show up on black and white photographs, they are often readily apparent when color film is used. Furthermore, with the proper selection of filters, it is possible to distinguish between the three basic types of rock - igneous, sedimentary and metamorphic.

The development of modern stereoscopic cameras has greatly simplified the conduct of geologic surveys and the making of topographic maps. Pictures taken through stereoscopic lenses need only a simple viewer to bring the surface features into sharp relief. Indeed, some people are able to perceive the 3-D effect without the aid of any viewer. The dip and strike of the terrain, depth of canyons and the height of trees are easily measured when a three dimensional photo is available. The same stereo effect can be obtained from two aerial photos taken in quick sequence with the camera directed straight down. If the two slightly different images are then superimposed by a special viewer, a three dimensional image can be created."

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Industrial research continues to develop new uses for minerals. Recently the Socony Products Co., Metuchen, N.J. announced a new paint-on zinc primer produced from inorganic zinc silicate (willemite?). They claim that this primer provides excellent resistance to heat, water, humidity, salt spray, gasoline and organic solvents. The coating, which can be applied to hot surfaces, resists temperatures up to 750°F. The primer, 92% zinc by weight, provides electrolytic protection similar to galvanizing.

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The story of man's utilization of metals has been extended back in the past and forward in the future by two recent news items -

"Artifacts unearthed at a Neolithic village site in Turkey this past summer indicated that man may have recognized the useful properties of copper as long ago as 7000 B.C. The excavation, at Cayonu in eastern Turkey, a few miles from the ancient copper mines at Maden, was jointly directed by Haler Cambel of the University of Istanbul and Robert J. Braidwood of the University of Chicago. In May, the investigators uncovered small beads of malachite and part of a metal drill that had been shaped by grinding down a nugget of native copper. Although these discoveries occurred in levels that predated the first use of pottery at Cayonu, Miss Cambel and Mr. Braidwood were initially not greatly impressed; there was no evidence that the early craftsmen realized they were working with a novel material, and the objects could equally well have been made out of a nonmetallic mineral.

The excavators then found three tiny pins, completely oxidized but apparently made of copper, two of them, each half pointed at one end; the third was pointed at both ends and bent at more than a right angle. Making such shapes as these from native copper would require cold hammering, a technique only a few steps removed from full metallurgy. The discoverers are now awaiting laboratory analyses to determine if the three pins are indeed copper. If such is the case, Miss Cambel and Mr. Braidwood point out, it will prove that 9,000 years ago the people of Cayonu were "using metal as metal rather than as another object such as stone and wood." (Scientific American December 1964, pages 63-64.)

"A new theory that makes it possible to predict the characteristics of any combination, in any quantity, of 30 transition metals has been developed by Leo Brewer of the University of California's Lawrence Radiation Laboratory. A theory of the behavior of electrons in crystal structures, it takes into account all temperatures up to the melting point, and it could be extended to higher temperature. Because the 30 transition metals can be combined in two billion ways, not counting the infinite number of combinations involving different quantities, laboratory studies of all the hypothetical alloys are impossible. Thus the theory promises a great acceleration in the search for the new materials needed in many advanced technologies. In addition the theory is expected to play an important role in the design of high temperature purification processes essential to the production of super conductors and semi conductors, which are made from transition metals.

The metals covered by the theory fall into three groups, from element 19 (potassium) through element 28 (nickel); from element 37 (rubidium) through element 46 (palladium); and from element 55 (cesium) through element 78 (platinum). Among these metals are iron and chromium and exotic elements of increasing utility, such as titanium, zirconium, niobium, tantalum and molybdenum. Alloys of some transition metals provide lightweight materials of great strength and resistance to high temperatures and radiation. Until now the search for such alloys has had to be conducted largely on a hit or miss basis.

For four decades chemists have had a rule developed in Britain by W. Hume-Rothery for predicting the structure of compounds of the nontransition metals, which include aluminum, zinc and tin. The greater variety of electron states in the transition metals had precluded development of a similar theory for them. Brewer's new conception is based on the work of Linus Pauling and Hume-Rothery and particularly on a theory of Niels Engel, a Danish chemist now working on the faculty of the Georgia Institute of Technology and at the Oak Ridge National Laboratory. Brewer combined Engel's ideas with known information on the size of atoms and on the effect of heat on various combinations of metals. He also made use of predictions from theories of solubility.

The new theory is expressed in several ways involving tables and charts. A chemist can look at these and determine the properties of a given proposed mixture. Among other things, the charts show that it is possible to make compounds that violate earlier chemical laws of definite combining proportions." Scientific American, August 1964, page 40.

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While doing research on the Andover Mine, Don Swayze of Elizabeth, N.J. came across the following item, which should interest our members. From an address by Jacob W. Miller delivered before the New Jersey Historical Society at its Ninth Annual Meeting, Trenton, N.J. January 19th, 1854.

"Our mineral productions are also about to be enlarged, by the opening and working of extensive veins of the Franklinite. This ore, by reason of its peculiar combinations, has hitherto been of little use in the manufacture of iron; but nature's concretions, although not readily comprehended by man, are always intended for his benefit: he has only to discover the key which will unlock the mystery. The discovery has been made, and the salamander of the charcoal furnace, now yields to the heat of the Anthracite, and becomes both a flux and a vapor, producing the best of iron and the most durable of paints.

In the year 1852, about one hundred years from the time when that first cargo of Colonial bar iron made its appearance in England, there was placed at the door of the Crystal Palace in London, because it was too large for entrance, a mineral rock, which by its size and rare quality, commanded attention even at the World's Fair. This was a Jersey production, a pebble specimen of our mountain of zinc. And the New Jersey Zinc Company had the honor of obtaining the prize metal, over the competing companies of France and Belgium. The Committee which awarded this price, composed of the most distinguished chemists, pronounced the introduction of the oxide of zinc as a white paint in place of salt lead, as one of the remarkable events in the recent history of chemical art.

This new use to which zinc ore is now applied, will soon make it one of the most important of our minerals. The New Jersey Zinc Company, the first of the kind in this country, commenced its operations about three years ago. In 1852 they manufactured 1,200 tons of paint. In 1853 they raised 6,982 tons of ore, producing 2,200 tons of paint. Their improved works are now making regularly from 75 to 80 tons of paint per week, and during the present year, they expect to mine 12,000 tons of ore.

If experiments now being made prove successful, our zinc ores will also assume national importance, by affording the only chemical substance which will protect our naval and commercial ships against the ravages of those destructive agents of the sea, the marine worm and barnacle formations.

This Jersey manufacture has also acquired a celebrity seldom attained by an American production. It not only embellishes the rooms of our Democratic houses, but has found its way into royal palaces, and it is said that one of the apartments in Windsor Castle may be distinguished from the others, by the glossy whiteness, which is peculiar to Jersey zinc paint."

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Esperite, a Proposed New Name for Calcium-Larsenite

Mr. Swayze also sent me the abstract of a paper read at the Annual Meeting of the Mineralogical Society of America, Miami Beach, Florida, November 19th-21st, 1964, by Paul B. Moore and Paul H. Ribbe, Dept. of Geophysical Sciences, The University of Chicago, Chicago, Ill. The complete paper is scheduled to be published in the American Mineralogist, probably in July or August, 1965. Abstract follows:

"Single-crystal studies of "calcium-larsenite" from Franklin, N.J. show that it is not a larsenite, but a new type of zinco-silicate allied in structure to beryllonite and trimerite. We propose to name it for Prof. Esper S. Larsen, Jr. Electron microprobe analysis establishes the formula $\text{Ca Pb}(\text{ZnSiO}_4)_4$ for our specimen which is monoclinic: $a = 2 \times 8.814\text{\AA}$; $b = 8.270\text{\AA}^3$; $c = 2 \times 15.26\text{\AA}$; $B = 90^\circ$; the space group is $P2_1/n$.

The intensities of h0l reflections of "calcium-larsenite" have a high correlation to those of beryllonite and trimerite. The atomic coordinates of beryllonite (Golovastikov, 1961) were used to calculate structure factors for "calcium-larsenite", substituting (Ca,Pb) for Na,Zn for Be and SiO_4 for PO_4 .

A comparison of I observed and I calculated indicates that the structures of the two minerals are substantially the same. There is the notable difference of superstructure in "calcium-larsenite", presumably due to Ca-Pb ordering. The inclusion of super-lattice reflections results in a B-face-centered cell: an ordering scheme is proposed. Trimerite shows similar superstructure, except that its reflections $h + l$ odd are "split" in a manner similar to the "e" type reflections of intermediate plagioclases. The basic structure in each mineral is a pseudo-hexagonal array of $\text{Na}(\text{Ca Pb})$ or (Ca,Mn) in the b-axis projection.

"Calcium-larsenite" decomposes to hardystonite, larsenite, and zincite at $700\text{--}800^\circ\text{C}$. and to hardystonite, willemite, and volatile Zn and Pb above 1000°C . The mineral fluoresces strongly in short-wave ultraviolet and X-radiation, and it is brilliantly cathodoluminescent."

Dr. Moore was an avid collector of Franklin minerals while still in his teens. It is gratifying to see that his interest still continues. We wish him well in his scientific career and hope that he continues with research on Franklin material.

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Axinite

In a paper published in 1961, three Russian scientists, Messrs. Koltun, Lyakhov, and Piznyur, reported their findings on the conditions for formation of axinite:

"One type of axinite occurs in druses as transparent euhedral crystals, rose pink in colour (sometimes with a lilac or reddish brown tint). The crystals have formed by slow growth from unsaturated solutions; the temperature of homogenization of the gas liquid inclusions gives a formation temperature of $120\text{--}200^\circ\text{C}$. A second type forms compact masses of dark brown platy crystals rendered turbid by included material. The gas-liquid inclusions have acute angled form, and are homogenized at $360\text{--}400^\circ\text{C}$; this is a high temperature form, deposited from supersaturated solutions. Examples of the first type are obtained from the Polar Urals and from Dauphine, France; of the second type from East Transbaikal and Saxony." (Mineralogical Abstracts, Sept. 1964, page 655)

These findings differ from the usual description of axinite as a "comparatively high temperature mineral". The specimens mentioned are of ferro-axinite. The orange yellow axinite, peculiar to Franklin, is a mangan-axinite. Published analyses show MnO as 13-14%, much greater than any other axinites studied. Franklin mangan axinite is also unique for some specimens that fluoresce red, stronger under short wave than under long wave. Franklin axinite is prized by the collector for its own qualities and because it often forms the host for the rare Parker Shaft minerals.

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Barysilite

In the American Mineralogist, Sept-October 1964, pages 1485-8, Dr. F.P. Glasser, Department of Chemistry, University of Aberdeen, Old Aberdeen, Scotland, gives new data on barysilite, using a crystal specimen from Franklin, loaned by the U. S. National Museum.

Dr. Glasser provides powder x ray data; gives cell dimensions as:
 $a = 8.46 \pm 0.02 \text{ \AA}$ $c = 38.3 \pm 0.2 \text{ \AA}$ $V_{\text{hex}} = 2380 \text{ \AA}^3$
and theoretical atomic cell contents of $3[\text{Pb}_4 (\text{Mn, etc.}), \text{Si}_3 \text{O}_3]$

He confirms rhombohedral symmetry and his calculated specific gravity of 6.70 agrees with observed figures of 6.55 to 6.706. He has also recalculated previous chemical analyses to 100% making certain assumptions, including the elimination of H₂O as an essential constituent.

He has found that barysilite inverts to an apparently new phase upon heating. The inversion temperature is $730 \pm 30^\circ \text{C}$ in dry N₂; the reverse reaction has not been observed in runs of 24 hour duration. The higher temperature phase persists to at least 960°C . in dry N₂. Cleavage flakes heated several hours at 960° retain their shape except for a slight rounding of the edges. Microscopic examination did not show any signs of liquid formation. This phase is much more refractory than the pure lead silicates. X ray data for this high temperature form is given. Efforts to synthesize barysilite were not successful.

Dr. Glasser concludes that barysilite is a valid mineral species containing essential divalent manganese and that it is not related to any known lead silicate nor to a hexagonal K₂O.2 PbO.2 SiO₂ phase described by McMurdie in 1941.

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Kutnahorite

The results of mineralogical research on kutnahorite from several localities in the neighborhood of Kutna Hora, East Bohemia, include optical properties, qualitative spectrographic analysis, quantitative chemical analysis, and d.t.a. results. The crystallo-chemical formula has been calculated. The lattice constants of the kutnahorite from all the described localities agree with those of kutnahorite from Franklin, N.J., U.S.A.
Researcher Mr. Z. Trdlicka - Min. Abst., June 1964, Page 541.

Bustamite

Recent research has provided new data on Bustamite, $12[\text{CaMnSi}_2\text{O}_6]$.

Peacor and Buerger report that bustamite is triclinic; with a 15.412; b 7.157; c 13.824 Å, α 39°29', β 94°51', γ 102°56'; Space Group F1. The unit cell contains 12 molecules $\text{Ca Mn Si}_2\text{O}_6$. Refinement by least squares after the trial structure yielded (from wollastonite) $R = 9.5\%$. Planes of approximately close packed oxygen are oriented parallel to (101). Planes containing Ca and Mn atoms in octahedral coordination alternate with planes of Si in tetrahedral holes. Ca and Mn are ordered. Si tetrahedra are linked to form chains parallel to b with a repeat unit of three tetrahedra. (Min. Abstracts, June 1964, page 512)

Peacor and Prewitt report that a comparison of the structure of bustamite and wollastonite shows that the principal difference is only the relative arrangement of the chains of the tetrahedra. Both have a pseudomonoclinic cell. The cell for wollastonite has the space group $P2_1/m$ bustamite is $A2/m$. (Am. Min. vol.48, 1963, pages 588-596)

Lazarev and Tenisheva have tabulated the frequencies of infra red absorption spectra for bustamite (from Belogorsk, U.S.S.R.) and for wollastonite, rhodonite and pyroxmangite (from Glen Beag, Inverness-shire). (Min. Abst., June 1963, page 185).

Their previous work lead Peacor and Prewitt to more refined and sophisticated research into the crystal structures of the pyroxenes and the pyroxenoids. (Am. Min. Nov-Dec 1964, pages 1527-1542). They felt that the classification of the crystal structures of these two series according to the repeat unit of the silicate chain did not differentiate between structures which contain similar types of chains, yet are distinctly different such as the pyroxenoids, wollastonite, para wollastonite, bustamite and pectolite. In their paper they describe some structural relations which lead to an improved classification and to an understanding of the crystal chemical relations among these minerals. Refined data is provided for the pyroxenes- clinoenstatite, pigeonite and enstatite; for the pyroxenoids - wollastonite, pectolite, parawollastonite and pyromangite.

Johannsenite

A Mn-silicate from the Aravaipa, Arizona, mining district has been determined by optical, X ray, and chemical tests as johannsenite, containing small amounts of Mg, Fe, and Al. It forms tabular bodies of irregular masses replacing limestone which range from radiating or spherulitic aggregates a few cm across to masses several feet thick and tens of feet long. The johannsenite is pale yellowish brown to light olive grey, finely prismatic to fibrous. It was shown by x rays to be a monoclinic pyroxene. A chemical analysis and optical data are given. The paper by Frank S. Simons and Elaine Munson is printed in the Am. Min., volume 48, 1963, pages 1154-1158.

Bustamite and Johannsenite

Bustamite was named (after it's discoverer, M. Bustamente) and described in 1826 on material from Mexico. It was classified as a lime rich variety of rhodonite. In 1922, Larsen and Shannon provided optical data and chemical analysis on material from Franklin, establishing bustamite as a separate species. Supporting and additional data were provided by Hey and Sundius. Later, bustamite was shown to be an inosilicate and a member of the pyroxenoid group. Continuing research keeps providing new information on this interesting species.

Some confusion in the past was caused by the composition of the specimen material. Pure bustamite has been found at Franklin and Langban; other material from Italy, Hungary and the original Mexican bustamite proved on re-examination to be mixtures of rhodonite and johannsenite. Bustamite and johannsenite are both calcium manganese silicates. Bustamite is the high temperature form; johannsenite the low temperature form; the transition point is 830°C; on ignition, johannsenite inverts to bustamite at this temperature. Mixtures of the two species are sometimes found. At Franklin, the original find of johannsenite was as minute brown crystals imbedded in bustamite. Later finds had different associations.

Bustamite crystals, although very rare, have been found in Franklin specimens. Normally, Franklin bustamite is white to pale pink massive with a fibrous appearance and cleavage surfaces of a pearly luster. All bustamite powders into fibers, which under the microscope will show cleavage. Normally non fluorescent, occasionally specimens of bustamite will fluoresce a deep red under long wave.

Johannsenite at Franklin is very rare. This mineral was named after Prof. Albert Johannsen of the University of Chicago. It forms columnar, radiating aggregates of fibers and prisms, usually green, gray or light brown. At most occurrences (not Franklin) some of the johannsenite is altered in part to rhodonite. The Aravaipa location described above evidently contains the largest find of this mineral; no mention is made of a mixture with rhodonite.

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The Singing Wilderness

A recent addition to my library was *The Singing Wilderness* by Sigurd F. Olson, (Alfred A. Knopf, New York City, 1956). In this book Mr. Olson tells of the lake country of northern Minnesota and adjoining Canada, in which he guided for over thirty years. An educated, talented naturalist and a lucid, lyrical penman, Mr. Olson describes the passage of a year in the country he loves and knows so well. The chapter entitled "The Stone Wall" had a particular appeal for me. I am sure you will enjoy it, too.

Chapter 8 - The Stone Wall. from *The Singing Wilderness*

Whenever life doesn't seem to be fun any more, I have an infallible cure; I go out and work on my wall — dig rocks out of the turf and move them from where they have been resting for ten thousand years or more to some place of my own choosing. Somehow when I do this the world moves off magically to where it belongs and I take the helm, no matter what the situation at the moment happens to be.

This moving of stones is almost like the laying on of hands, except that in this case the process is reversed, for when I touch them I seem to exchange my little worries for some of their stability and calm.

I like stones. To me they are not dead or inert but as alive as the crystals that compose them. While they may appear unchangeable, I know that within them is a dynamic cosmos, each one with a character of its own and an indelible record of some phase of the earth's history.

They make me remember places I have seen; cliffs covered with mosses and harebells, roaring canyons in the wilderness, talus slopes where the marmots live, glaciated ridges, pebbled beaches and rocky shores. I like the rough feel of them and their weight, and the way the lichens and mosses have with them.

Not a stone in my wall but has a story to tell, not a one but brings back to me in a flash a vision of some place I have known. That wall is a record of my travels and an album of all creation, each stone a separate page from the long story of the past.

One section happens to be built of glacial boulders; granite and schist, red jasper veined with white quartz, greenstone and black basalt, and some whose names I do not pretend to know. Bounded by the rivers, lake shores, and coasts of the Hudson Bay country, they were gripped by the glacial ice and brought a thousand miles to the south. When the ice front retreated, they were dropped as terminal moraine on the hilltop where I live.

That was thousands of years ago, when the country was cold and devoid of life. Those rounded boulders had known the bitter years, had seen the first lichens and mosses that came to cover the scars of glaciation, had watched the slow formation of humus, an inch each thousand years, had felt at last the gripping roots of the tall red pines. They had seen the passing of the woodland caribou and the Indian tribes, were here when the white men moved in a century ago.

Then for the first time the scattered stones were moved by man and placed in great piles so the plow could go between. That is where I found most of them, hidden by the yellow and gold of sumac, cherry and birch. Now, after all these centuries of waiting, the water-and-ice-worn specimens from the entire Canadian shield had come to rest.

The large ones I built into the base, the smaller ones went on top, and the ones I knew best where I could always see them. They are the special ones whose stories are most meaningful to me. The common ones, the ordinary granites and schists and basalts, have their stories too, perhaps as vivid, if I knew them, as the rest. I do know the country they came from -- have seen the very cliffs and shores from which they were broken ages ago. Each one of them gives me a sense of being a part of the wilderness from which they came.

One of my prizes is a boulder of rough conglomerate which at one time was part of an ocean shore. The matrix is mud compacted into slate, but the pebbles it holds are round and smooth, and I know they have been rolled by the tides and storms of some arctic coast. That stone brings back to me pictures of all the sea-shores I have ever known, of sunlight shining on the beaches, of moonlight on the surf and the roar of it at a time when no one was there to hear.

Another is a section of hard hematite ore veined with jasper and quartz. That stone is beautiful, banded in pink and dark red and metallic blue, with a lace-work of snowy crystalline white. It goes back much further than the conglomerate, for the iron composing it was laid down by iron and sulphur bacteria, the first forms of life on this earth, organisms that had the faculty of building into their own microscopic structures raw iron from the earth's crust. When they died, great beds of iron-impregnated silt were deposited. Then after aeons of volcanic action, leaching, gigantic pressures with molten lavas coursing through them, they formed at last the hematite that today produces the finest steel in the world.

Even though that bit of iron ore was old, I found a broken ledge of greenstone far more ancient than any other stone in the wall, or, just possibly, in any wall on the face of the planet. That greenstone is part of the original crust formed when the molten lavas and gases first cooled. It came from the formation that underlies all others, has a tradition and permanence far more impressive than the glacial newcomers. I gave it a position suitable to its rank.

Another stone from a ledge or basalt is marked with glacial striae cut when the ice sheet wore down the peaks of the old Vermilion Range. I found it one day while watching a gang of workmen excavating for a road. They had shoveled off the sand and gravel from the ledge preparatory to blasting, and for the first time since the retreat of the Laurentian Lobe of the glacier that surface was exposed to the light. I saw it then as all rock surfaces must have looked before the weather dulled their brilliance. That day it was as freshly polished as when newly scoured by the ice, and the scratches of gravel from the glacier's grinding base were as sharply defined as though they were newly gouged. The blast came and the ledge was scattered wide. I saved one perfect piece, and now it rests where I can always see it and remember its story.

One day I found a flat section of slate covered with ripple marks. The instant I saw it, I knew it must have a very special place, for that stone was at one time washed by the waters of some ancient sea. When the bottom was exposed to the sun or volcanic heat, those ripples of a bygone age were baked into shape for all time. Those gray-green rippled surfaces had captured the movements of an ocean, its aliveness and constant change. After a rain the slate glistens and shines and the ripple marks look fresh. It rests proudly on top of the wall, a part of the ocean floor.

When I built a fireplace in one corner of the wall, I knew that it must be faithful to the Canadian shield; whatever went into it must somehow tell the story of the entire lake country of the north. And so I built into it samples of all the native types from hundreds of miles around, sections from the ridges, rivers and lake shores which would bring memories of all the country that voyageurs had traveled and explored. I whittled a set of wooden pothooks and a tea stick, and built a fire to darken the stone so that any canoeman coming by would catch his breath in recognition.

That cruiser's fireplace is a bit of the wilderness, a symbol of the companionship I have known on many expeditions into the north. When I kindle a fire there and see those rough, familiar rocks reflecting its glow, friends of the trail stand beside me and talk to me out of the past.

MEMBERSHIP RENEWAL FOR YEAR 1965

I would like to renew my membership in the Franklin-Ogdensburg Mineralogical Society for the year 1965. Dues of \$2.00 attached.

Name (Mr. Mrs. Miss) _____

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I believe the person or persons listed below may be interested in the F.O.M.S. and its activities. Please send them information.

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