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New Mexico Bureau of Mines & Mineral Resources

Socorro, New Mexico 87801

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NM Mineral Symposium

OPEN FILE REPORT 1982



JILL BARTEL 1985

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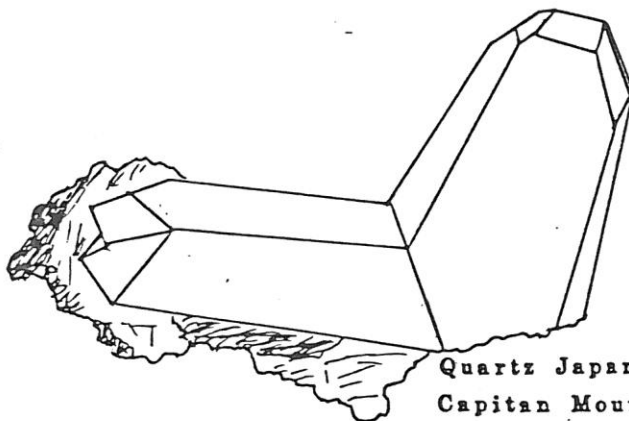
THIRD BIENNIAL

NEW MEXICO MINERALS SYMPOSIUM

November 13 & 14, 1982

Macey Conference Center

Socorro, NM



Quartz Japan Law Twin
Capitan Mountains, NM

Sponsored by:

NM Bureau of Mines

NM Tech Mineralogical Society

Albuquerque Gem and Mineral Club

3rd BIENNIAL NEW MEXICO MINERALS SYMPOSIUM

Schedule of Events

Saturday, November 13

- 8:00 - 8:50 a.m. Registration
8:50 - 9:00 a.m. Opening Remarks, Robert M. North
9:00 - 9:30 a.m. Minerals of the Silver Hill Area, Socorro County, NM,
William P. Moats and Robert M. North
9:30 - 10:00 a.m. Chalcophanite from the Hanover Fierro district, Grant
County, NM, Richard W. Graeme
10:00 - 10:30 a.m. Coffee Break
10:30 - 11:00 a.m. The Philadelphia Mine, Grant County, NM, Douglas L. Graeme
and Richard W. Graeme IV
11:00 - 11:30 a.m. Minerals of Point of Rocks Mesa, NM, Ramon S. DeMark
11:30 - 12:00 noon Igneous Rocks and Related Minerals of the Northern Delaware
Basin, Norbert T. Rempe
12:00 - 1:30 p.m. Lunch (You're on your own!)
1:30 - 2:00 p.m. Manganese Oxides ("Psilomelane") from Socorro County, NM,
Peter Modreski
2:00 - 2:30 p.m. Zeolite Minerals Found Near the Gila Cliff Dwellings
National Monument, Patrick E. Haynes
2:30 - 3:00 p.m. Break
3:00 - 3:30 p.m. A Proposal for Educational Mineral Exhibits in the New Mexico
Museum of Natural History, Jeffry Gottfried and Robert M. North
3:30 - 3:45 p.m. Kentrolite and Melanotekite from the Hillsboro area, Sierra
County, NM, Paul Hlava
3:45 - 4:30 p.m. Panel Discussion: The Future of the NM Mineral Symposium
4:30 - 5:30 p.m. Cocktail Party, Copper Room, Macey Center
5:30 - 7:00 p.m. Dinner (You're on your own!)
7:00 - 9:00 p.m. Silent Auction

Sunday, November 14

Field Trip. Orogrande Mining District, Otero County, NM

- 8:30 a.m. Leave Macey Center parking lot
12:00 noon Meet at Turnoff to Landfill North of Orogrande
12:00 - 12:30 p.m. Orientation
12:30 - 4:30 p.m. Collecting
5:00 p.m. Leave Orogrande

An "Early Bird" group will assemble at Macey Center and leave for Orogrande at 7:00 a.m., meeting at the Landfill turnoff at 10:30 for a short orientation period.

Minerals of the Silver Hill Subdistrict,
Socorro County, NM
William P. Moats
New Mexico Institute of Mining & Technology
Socorro, NM
Robert M. North
New Mexico Bureau of Mines & Mineral Resources
Socorro, NM

The Silver Hill subdistrict is located in the western half of the North Magdalena mining district, about 2 miles northwest of Magdalena, New Mexico. The district has produced a small amount of copper and silver from fissure veins in basaltic andesite.

Recently, small crystals resembling fornacite $(\text{Pb, Cu})_3[(\text{Cr, As})\text{O}_4]_2(\text{OH})$ were found on the Bullfrog #2 claim about $1/2$ mile southwest of Silver Hill. SEM and microprobe analysis have shown the material to contain Pb and Cu in the +2 valence site and Mo and minor As, V, and Cr in the +5, +6 valence site in the structure. X-ray diffraction shows the mineral to have the structure of fornacite. This chemistry and structure would make the material identical to a newly described (as yet, unnamed) mineral from Tsumeb. The mineral is associated with descloizite, willemite, mimetite, chrysocola, and hematite.

Other recent finds of micro-crystals in the district from other mines and prospects include duftite, $\text{Pb Cu (AsO}_4)(\text{OH})$, conichalcite, $\text{CaCu(AsO}_4)(\text{OH})$, and apatite $\text{Ca}_5(\text{PO}_4)_3\text{F}$. Iranite $\text{Pb}_{10}\text{Cu(CrO}_4)_6(\text{SiO}_4)_2(\text{F,OH})_2$ is also reported from the district, but has not been confirmed.

Chalcophanite from the Hanover-Fierro district
Grant County, New Mexico

Richard W. Graeme

A second New Mexico occurrence of chalcophanite, the rare zinc manganese oxide has recently been found. Located in the long abandoned Lone Star Mine, significant quantities of uncommonly attractive specimens have been recovered.

Aside from the scarce nature of this mineral, several unusual, if not unique depositional features accompany this occurrence. Most notably, the chalcophanite is found almost completely decorating a solution cavity that measures approximately 35 feet in length, 15 feet in width and 10 feet high. Secondly, the only apparent source of the necessary manganese is a solid solution mixture of the clinopyroxenes hedenbergite-johannsenite occurring immediately above the opening.

The Philadelphia Mine
Douglas L. Graeme Richard W. Graeme Hanover, NM

The Philadelphia Mine is located in the Hanover mining district of Grant County, New Mexico. After a century of oblivion, it now has yielded specimens that will most certainly make it a noted locality within the state. Harrison Schmitt in his classic 1939 report on the Pewabic Mine noted the occurrence of large crystals of several specimens at the nearby Philadelphia. However, few, if any, examples of these are known today.

Recent work at this long-abandoned mine has produced numerous examples of quartz twins on the Japan law and some highly unusual magnetite composite crystals that may be pseudomorphs after a mineral, yet, unidentified. Occurring in a pegmatite-like environment, these minerals are associated with sprays of epidote, large apatites, beryl, and nearly two dozen other species.

Minerals of Point of Rocks Mesa
Ramon S. DeMark
4942 West El Caminito
Glendale, Arizona

Northeastern New Mexico has long been known for its stark landscape, coal mines and Capulin Volcano but little which is of interest to the mineral collector. Tertiary age basaltic flows have resulted in vast mesas overlaying Mesozoic sediments which are irregularly punctuated by volcanic cones produced late in the extrusive sequence. While the region is certainly fascinating, it has previously been considered a highly implausible area for the occurrence of noteworthy mineral specimens.

Point of Rocks Mesa, a solitary landmark along the Cimarron Cutoff of the Santa Fe Trail about twenty-four miles east of Springer, New Mexico, has now been revealed as a location of great interest to the mineral collector and mineralogist due to the occurrence of rare mineral species in free standing, euhedral crystals. Villiaumite, neptunite, ancylite, serandite and nepheline, as well as other species not previously-described from New Mexico, have been found in well-formed microcrystals in vugs that range from 2mm to 5 cm. The host rock is a peralkaline phonolite which forms the upper portion of the mesa. The mesa rises about 200 feet above the surrounding plains, and a quarry on the southwest side of the mesa has been particularly productive of well developed crystals. Due to the complexity of the mineralogy at Point of Rocks Mesa, it is anticipated that additional species new to New Mexico will come to light as investigations continue.

Igneous Rocks and Related Minerals of the
Northern Delaware Basin, Revisited
Norbert T. Rempe
Yates Petroleum Corporation Artesia, NM

Mid-Tertiary igneous activity in the northern Delaware Basin of southeastern New Mexico and adjacent Texas resulted in dikes, "plugs", and even ore mineralization. Known intrusive bodies lie parallel and conjugate to prevailing regional tectonic trends. Many more features of igneous origin may be hidden under Cenozoic cover.

Guadalupian bentonites witness to volcanic activity nearby. Correct interpretation should shed new light on plate configuration and dynamics during the Upper Permian.

Manganese Oxides ("Psilomelane") from Socorro County, New Mexico
Peter J. Modreski U.S. Geological Survey Denver Federal Center Denver,
Colorado 80225

The exact nature of the banded-massive to radiating-fibrous black manganese oxides from the Luis Lopez district, Socorro County, has long been and continues to be a mineralogical riddle. The mineral has been described variously as psilomelane, "pseudo-psilomelane", pyrolusite, pseudomorphs of psilomelane after pyrolusite, hollandite, coronadite, and intergrowths of hollandite + romanechite.

The difficulties arise because the material is mineralogically complex and does not fall into simple mineral categories. Much of it is poorly crystalline and gives diffuse X-ray diffraction patterns. Its chemical composition is variable, with the proportions of large metal cations (Ba, Pb, K, Sr), the water content, and the proportions of manganese in different oxidation states all varying between ideal end-members such as hollandite, $\text{Ba}(\text{Mn}^{+4}, \text{Mn}^{+2})_8\text{O}_{16}$; coronadite, $\text{Pb}(\text{Mn}^{+4}, \text{Mn}^{+2})_8\text{O}_{16}$; cryptomelane, $\text{K}(\text{Mn}^{+4}, \text{Mn}^{+2})_8\text{O}_{16}$; and romanechite, $\text{Ba Mn}^{+2}\text{Mn}^{+4}_8\text{O}_{16}, (\text{OH})_4$. Banded fibrous material from the vicinity of the Tower and Nancy mines at the head of Black Canyon, Luis Lopez 7 1/2' topographic quadrangle, gives X-ray powder diffraction patterns that are inconclusive as to its exact mineralogical identity. Electron microprobe analysis shows this material to be chemically zoned; individual layers range from nearly pure barium manganese oxide (hollandite or romanechite) to material containing as much as 20 weight percent PbO , close to coronadite in composition. Turner and Buseck (1979, *Science*, v. 203, p. 456-458), using high-resolution transmission electron microscopy, have shown that individual crystal fibers from the Rattlesnake mine in the Luis Lopez district are composed of a random mixture of submicroscopic regions, each of which is just a few unit-cells thick, alternating between hollandite and romanechite crystal structures. This variably constituted mineral only marginally satisfies the criteria of crystal structure, fixed chemical composition, and homogeneity that are used to define a specific mineral species. The material might be considered a mineraloid rather than a particular mineral species, and the old general term, psilomelane, may be the best name to use after all.

Zeolite Minerals Found Near
the Gila Cliff Dwellings National Monument
Patrick E. Haynes
Virgin Mining Company
Truth or Consequences, NM

Several good collecting sites have been found recently in the extrusive andesites near the Gila Cliff Dwellings National Monument. Specimens of the zeolite minerals chabazite, mesolite, stilbite, heulandite, analcime and levyne have been found. Associated minerals are quartz, commonly with pagoda or scepter terminations, calcite and rarely apophyllite. All of the specimens found so far have been along more easily accessible locales along forks of the Gila River.

Up to the Middle Fork of the Gila River have been found chabazite crystals over an inch on an edge, heulandite crystals over one-half inch long and stilbite crystals over an inch long. Occasionally found associations may include one-third inch chabazite crystals on an amygdular section composed mostly of pagoda and quartz scepters; or a stilbite bowtie sitting on well-formed one-quarter inch heulandite crystals.

Near the junction of the East Fork of the Gila River with the Gila River are sporadic concentrations of mesolite. Mesolite amygdules are typically small, but have been seen to reach over five inches. The mesolite may occur as acicular puffs or as a complete fuzzy lining. Associated zeolites with the mesolite are heulandite, chabazite, stilbite, analcime and in only three specimens, levyne.

Thus far, only a small portion of the total possible areas of zeolite occurrences in the Gila have been investigated by mineral collectors. As "new" areas are investigated certainly some good locales will come to light and, possibly, other zeolite species can be added to the current-list.

A Proposal for Educational Mineral Exhibits
for the
New Mexico Museum of Natural History

Jeffry Gottfried
Albuquerque, NM

Robert M. North
New Mexico Bureau of Mines and Mineral Resources
Socorro, NM

The New Mexico Museum of Natural History had its groundbreaking ceremonies on November 8th in Albuquerque. The museum has space planned for a mineral exhibit, affording mineral enthusiasts of New Mexico a rare opportunity to help plan a mineral display from "ground zero".

Presently, two areas are allocated for mineral-related displays: a general mineral display and the Naturalist Center.

The proposed general displays will be organized around the theme of mining districts, displaying the various ore and gangue minerals from selected districts in a context of the human interaction with minerals. While the minerals and their natural beauty will be the main theme, a small bit of human history will help tie together the natural mineral associations. This type of display is designed to draw and hold the interest of the average person; one without extensive knowledge of chemistry or geology. The geology and chemistry of the ore deposits will be woven into the display for those who are interested.

The Naturalist Center, sponsored in part by the Junior League of Albuquerque, will contain animal, plant, and mineral specimens in an informal setting that will encourage visitors to experiment and find out about minerals from firsthand knowledge. The Naturalist Center is being designed with children in mind, but will hopefully appeal to visitors of all ages.