PROGRAM & ABSTRACTS

SECOND MIDWEST MINERAL SYMPOSIUM
SATURDAY APRIL 10, 1999
VETERANS MEMORIAL - 300 W BROAD ST, COLUMBUS OHIO

SPONSORS: Friends of Mineralogy Midwest Chapter and
Central Ohio Mineral, Fossil, Gem & Jewelry Show

INVITED SPEAKER PROGRAM - 8:00 AM to 12:30 PM

8:05-8:10 ERNEST H. CARLSON, Kent State University, Kent OH. "Welcome & Introduction".

8:10-8:40 ERNEST H. CARLSON, Kent State University, Kent OH. "Celestite (Celestine) Of The Findlay Arch District, Ohio, Michigan and Ontario".

8:40-9:10 DALE GNIDOVEC, Orton Museum, The Ohio State University, Columbus OH. "Orton's Minerals - The First 500".

9:10-9:40 PHILIP EVANOFF, Chillicothe OH. "Microminerals From Michigan, Ohio And Adjacent Areas".

9:40-10:10 MICHAEL C. HANSEN, Ohio Geological Survey, Columbus OH. "Gold And Diamonds In Ohio".

COFFEE BREAK

10:30-11:00 KENNETH B. TANKERSLEY, Department of Anthropology, Kent State University, Kent OH. "Prehistoric Cave Mineral Procurement In Eastern North America".

11:00-11:30 ANDREW A. SICREE, Earth & Mineral Sciences Museum, Pennsylvania State University, University Park PA. "The Upper Mississippi Valley Zinc-Lead District".

11:30-12:00 NELSON R. SHAFFER, Indiana Geological Survey, Bloomington IN. "Geodes - Where Do They Come From, Where Do They Go?".

12:00-12:30 BILL McKENZIE, Lexington KY. "Quartz Geodes And Nodules from Central Kentucky Including Those Containing Millerite From Halls Gap".

CELESTITE (CELESTINE) OF THE FINDLAY ARCH DISTRICT, OHIO, MICHIGAN AND ONTARIO

Ernest H. Carlson

Department of Geology, Kent State University, Kent OH 44242

A number of quarries in northwestern Ohio, southeastern Michigan and southwestern Ontario are world class sites for fine crystals of celestite ($SrSO_4$). Especially notable are quarries at: Clay Center, Custar, Genoa, Lime City, Portage and Woodville in Ohio; Maybee and Rockwood in Michigan; and Amherstburg in Ontario. Celestite in the district was first reported in 1820 at Green Island by an instructor from West Point Military Academy on maneuvers in Lake Erie. Crystal-lined caves are present at sites such as Crystal Cave, Genoa, Lime City, Portage and Woodville. Celestite also occurs in fractures, cavities of fossils, openings of breccias, and as replacements of nodular gypsum.

The crystals range from a few millimeters to 45 cm in length, the largest being found at Crystal Cave. Two crystal habits are especially common: bladed to tabular crystals which are elongated along the crystallographic *b* axis and exhibit a large basal pinacoid; and prismatic crystals which are elongated along the *a* axis and show vertical growth striations on the front pinacoid. As a rule, bladed to tabular crystals were deposited before early (brown) fluorite, while prismatic crystals formed later than fluorite, sphalerite and much calcite.

The celestite occurs across an area about 90 km wide by 180 km long that is centered on the Findlay Arch, a broad northerly plunging anticline. This feature is bounded by structural basins on the east, north and west. The host beds are mostly carbonate rocks (dolostones) that range in age from Middle Silurian to Middle Devonian. Field relationships indicate that celestite is younger than Middle Devonian and older than Pleistocene. No radiometric age dating of the mineralization has been done. The celestite is associated spatially with commercial beds of gypsum that are Late Silurian in age. The gypsum contains notable amounts of strontium, and is believed to be the source of sulfur and strontium in the celestite.

Dale Gnidovec

Orton Museum, Department of Geological Sciences
The Ohio State University, Columbus OH

Orton's Minerals - The First 500

The catalog of the Orton Geological Museum at Ohio State University contains over 50,000 entries. Although most of those entries are for fossils, many of the early items cataloged were minerals, some from famous localities. This talk will look at some of those early specimens. We will also look at Edward Orton, Sr., one of the seven original faculty members, the first president of the university and one of Ohio's first state geologists.

PHILIP C. EVANOFF

Chillicothe, Ohio

Microminerals from Michigan, Ohio, and Adjacent Areas

The 112 slides illustrate 29 species of microminerals from 41 localities within the six states of Michigan, Wisconsin, Illinois, Indiana, Kentucky, and Ohio. More than 95 of the specimens have been collected within the last 15 years and about 60 of them have been collected personally. The great majority are from Ohio and Michigan since this is where most of my collecting trading, etc. has taken place. While field collecting in this and other areas is becoming more difficult and less fruitful, there are still many opportunities to acquire specimens. All the copper mines in the Keeweenaw Peninsula are now shut down but there are a very large number of dumps open to collectors. Use for road fill and real estate development, plus intensive collecting by the mineral fraternity are steadily eating away at these but, with persistence and work, excellent specimens may be found. Quarries in Ohio, Michigan, and Indiana probably have as many specimens available as ever but restrictions due to insurance and safety regulations, plus the sporadic exposure of the mineralized areas in the quarries, result in much higher levels of persistence and effort being needed for collecting successfully.

Michael C. Hansen

Ohio Division of Geological Survey
Columbus, Ohio

GOLD AND DIAMONDS IN OHIO

Serious prospecting for gold in Ohio appears to have begun soon after the 1849 California gold rush. Scanty literature on this topic suggests that reports of gold discoveries elsewhere in the world motivated less venturesome prospectors to pan nearly every stream in the state. Discoveries of a few flakes of placer gold were sufficient to launch construction of sluices and even shafts in the Batavia area of Clermont County and the Bellville area of Richland County. None of these ventures lasted long nor were any profitable. All were based on a mistaken premise that placer gold was derived from nearby primary veins, although geologists of the Second Geological Survey of Ohio in the 1870's correctly deduced, and bluntly proclaimed, that Ohio gold was the result of glacial transport from Canada and concentrations were uneconomic. Although minor occurrences of gold have been widely reported from scattered localities throughout the glaciated two-thirds of the state, most occurrences are probably not recorded in the literature. Little scientific study of these occurrences has been carried out. Limited studies suggest that comparatively "rich" placer deposits are the result of at least two cycles of concentration by running water; that is, Pleistocene meltwater deposits are being eroded by modern streams, which further concentrate minor amounts of gold.

At least six, and possibly seven, diamonds have been reported from Ohio and all were the result of serendipitous discoveries rather than purposeful searching. The discoveries have been distributed through time, from 1870 to 1982, as well as geographically, from southwestern Ohio (three occurrences), central Ohio (one dubious report), and northeastern Ohio (three occurrences). Only one specimen is known to survive. These occurrences seem to fit with the distributional pattern of Great Lakes drift diamonds, as described by C. B. Gunn in his 1968 catalog. Their origins have been the subject of much speculation, including local, undiscovered kimberlite pipes. The recent discovery of kimberlites in Canada and the northern Great Lakes area suggests that the Ohio diamonds have a northern source and were transported to the state by Pleistocene glaciers.

Prehistoric Cave Mineral Procurement in Eastern North America.

Kenneth B. Tankersley, Department of Anthropology, Kent State University, Kent, Ohio 44242

While archaeological examples of cave exploration and use are geographically and temporally widespread, the best documented examples of prehistoric cave mineral procurement are present in some of the largest caves of eastern North America. Although there are thousands of caves in this region, only a small percentage of these were prehistorically explored and exploited for mineral resources. Many of these caves were simply too vertical, too small, or too wet for repeated human visitation.

However, in some caves containing horizontally-developed, dry, upper level passages, prehistoric people collected, mined, and quarried a variety of cave minerals. "Collecting" often involved nothing more than plucking a mineral from a cave wall or ceiling, or simply picking up a detached piece of mineral from a floor or ledge or breakdown surface. Mining and quarrying, on the other hand, were planned and labor-intensive activities. The term "mining" specifically to refer to the excavation of unconsolidated sediments in order to expose and remove minerals or mineral inclusions. The term "quarrying" is used to denote the extraction of a mineral by hammering, splitting, or pulling apart exposed mineral or rock surfaces. In some cases, mining and quarrying involved moving tons of rock or sediment.

This paper focuses on six eastern North American cave systems: Wyandotte Cave in the Crawford Upland of south-central Indiana; the Flint-Mammoth Cave System, which includes Salts Cave, and Lee Cave, in the Chester Upland and Pennyroyal Plateau of west-central Kentucky; the Jaguar and Saltpeter cave systems, in the Cumberland Escarpment of north-central Tennessee; and the Big Bone Cave System in the Cumberland Plateau of south-central Tennessee.

GEODES - WHERE DO THEY COME FROM, WHERE DO THEY GO?

Nelson Shaffer

Indiana University, Bloomington IN 47405

Geodes, fascinating but enigmatic structures, subspherical concretions of quartz, are found in many outcrops of Mississippian age rocks around the edges of the Illinois Basin. Mineral collectors seek large (2 to 30 inch) geodes for the fine crystals some contain but many less desirable small or solid geodes also occur. In Indiana, geodes are most common in dolomitic and silty or argillaceous beds of the Ramp Creek Formation, that lies above the Borden Shale.

Petrographically, geodes consist of layers of different types of quartz. A chalcedony shell forms the outer layer that is followed by mosaic then large single crystals. Early formed crystals contain anhydrite and gypsum inclusions. Thin shelled, gypsum-filled geodes occur in southern Indiana and northern Kentucky implying replacement of evaporite nodules as an origin. Geodes also form around fossils. Nearby beds contain carbonate concretions that were not geodized. Geodes show evidence of expansion during growth especially those which nucleate on fossils. Our research shows that 1) more geodes occur in beds with high acid-insoluble residue contents, 2) oxygen isotopes of geodes are like those in insoluble residues of enclosing beds, 3) fluid inclusions show growth at moderate temperature (80 to 100°C) from brine solutions, 4) geodes formed around gypsum nodules or fossils, 5) rates of quartz formation slowed during geode growth, 6) geodes formed early in the sediments history, 7) geodes contain diagenetic secondary minerals that reflect a complex history, 8) geodes weather in near surface conditions losing unstable minerals.

Quartz Geodes and Nodules from Central Kentucky Including Those Containing Millerite from Halls Gap

Bill McKenzie, Lexington, Kentucky

Middle Mississippi rocks in the Central Kentucky area, including those of the Borden, Slade and Salem formations, produce a variety of silicified geodes and nodules. These may contain crystalline quartz of colorless, white, lavender or smoky tones and/or chalcedony in a variety of colors and patterns. These compact packages may also contain sulfides, sulfates and carbonates in various combinations as well as hues and colors.

Five areas which have and/or are producing fine material are:

1) Halls Gap, Lincoln County
2) Kings Mountain, Lincoln County
3) Big Hill, Madison County
4) Brodhead, Rockcastle County
5) Rock Lick Creek, Jackson County

Geodes and nodules may be spheroidal, ovoidal, or discoidal in general shape and range from a fraction of an inch in the larger dimension to 2+ feet in diameter and weigh in the range of hundreds of pounds.

Techniques for collecting geodes and nodules depend on the type of material sought and the location. An understand of rock classification and stratigraphic relationships is helpful in discovery and field collecting activities.

Halls Gap, Lincoln County continues to produce occasional millerite-bearing geodes but collecting in certain parts of the ledge has become extremely dangerous.