GEODE COLLECTING . . .

The search for geodes can be both fun and educational. Once you've located exposures of lower Warsaw strata or a geode-bearing stream course, all that's required is a little patience and a good bricklayer's or rock hammer. A sharp blow with a hammer is usually sufficient to crack open individual geodes, exposing their crystalline interiors to daylight for the first time. Remember that most geode-collecting localities are on private land; and permission must be secured before entering. Also, collecting is not permitted at Geode State Park.

ADDITIONAL READING . . .

Horick, P.J., 1974, The Minerals of Iowa: Iowa Geol. Survey, Educ. Series 2, 88 p. Available from the Geological Survey Bureau, Iowa Dept. of Natural Resources

Sinotte, S.R., 1969, The Fabulous Keokuk Geodes: Wallace-Homestead Co., Des Moines, IA., 292 p. Check your local library.

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GEODE

Iowa's State Rock

Geodes from Iowa have long been objects of curiosity, their sparkling interiors containing some of the most beautiful crystals to be found anywhere in the Midwest. Although geodes are known from many localities around the world, one of the most productive and famous collecting regions is encompassed within a 35-mile radius of Keokuk, Iowa. Rock collectors commonly refer to geodes from this region as "Keokuk geodes". In keeping with the world-renowned status of the Iowa geodes, the Iowa General Assembly declared the geode as the official "State Rock" in 1967.

The word "geode" is derived from the Latin meaning "earthlike", a reference to their rounded shape. Most Iowa geodes are roughly spherical, often lumpy or cauliflower-like in form, with diameters typically ranging between two and six inches. However, specimens up to 30 inches are known. The most prized geodes have hollow interiors, although many are solid objects in which crystal growth has filled most or all of the interior volume. Geodes possess a distinct outer layer which is more resistant to weathering than the rock material in which they occur. As such, complete geodes commonly weather out of rock exposures and accumulate in stream bottoms.

Geodes from the Keokuk area contain a variety of minerals, but quartz is dominant. Quartz is silicon dioxide, the primary mineral in ordinary sand. Beautiful transparent-to-white quartz crystals cover the walls of many geode cavities. These crystals become larger and fewer in number towards the center of the geode, and terminate in characteristic pointed pyramid shapes.

Chalcedony, a variety of quartz whose component crystals are too small to be seen with the naked eye, forms the outer shell in all "Keokuk geodes". Chalcedony layers also encrust the interior walls of many geode cavities, covering the surfaces of the earlier generation quartz crystals in a variety of colors, including white, pink, gray, blue, yellow and orange.

Calcite also is a common and attractive calcium carbonate mineral in many geodes. An additional 17 minerals have been identified in "Keokuk geodes".

Iowa's geodes can be found in specific stream drainages in parts of southeastern Iowa (especially in Lee, Henry, and Van Buren counties), including the area near Geode State Park.

Geodes, often concentrated in layers, can be dug out of exposures of the Warsaw formation, a widespread rock unit of Mississippian age (340 million years old) composed of shales, shaley dolomites, and limestones. Where water and streamflow have eroded these strata, concentrations of geodes may accumulate in stream channels.

Although the bulk of Iowa's geodes are derived from the Warsaw Formation, geodes also are known from other formations of Devonian and Mississippian age at scattered localities in eastern and central Iowa.

Adapted from *Iowa Geology*, 1987;
Iowa Dept. of Natural resources

The origins of geodes have vexed geologists for a considerable time. There is agreement on these general points:

1) Geodes originally were nodules (concretions) of either limestone or anhydrite (a mineral related to gypsum), which formed within soft sediment by concentric, outward growth around some small nucleus or core.

2) The interiors of the concretions were dissolved, leaving a hollow space.

3) The minerals now seen inside geodes were transported in groundwater solutions and then left behind as replacements of the geode walls or as crystalline growths within their interior cavities.