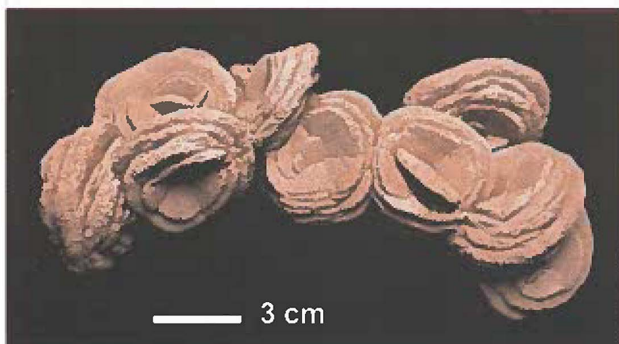


## How Do They Get Their Shape?

Each "petal" of a rose is a single crystal of barite, and what makes these barite crystals unusual is their round, disc-like shape. The best explanation to date is that the barite grew in the presence of organic compounds that stunted growth at the corners of crystals, leading to the rounded shape.

## How Do They Form?

At present, the best explanation for the roses is that deep basinal groundwater containing barium and reduced sulfur species (sulfide) migrated upward along fractures and porous layers into the Garber Sandstone. Upon reaching an aerated region, the sulfur in the groundwater was then oxidized from sulfide to sulfate, leading to the precipitation of barite (which is extremely insoluble in natural waters). Another possibility is that separate sources of barium- and of sulfate-rich waters mixed during flow through the permeable Garber Sandstone, and hence barite roses were deposited where these two solutions mixed.



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## The Barite Rose



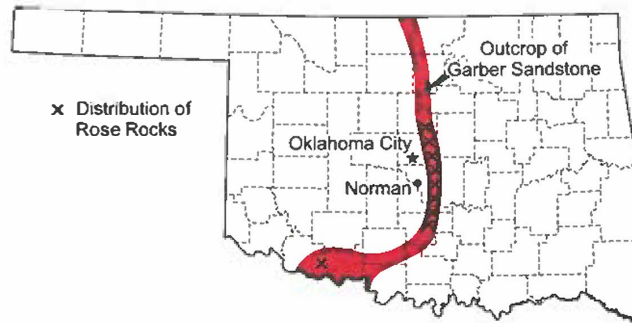
**State Rock of  
Oklahoma**

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# The Barite Rose Rock

## State Rock of Oklahoma

Few mineral specimens are as distinctly recognizable and traceable to source as the barite roses from Oklahoma. These are also known as “rose rocks” and “barite-sand rosettes.” Other than minor occurrences in Kansas, Morocco, and Australia, the barite roses are unique to this state.



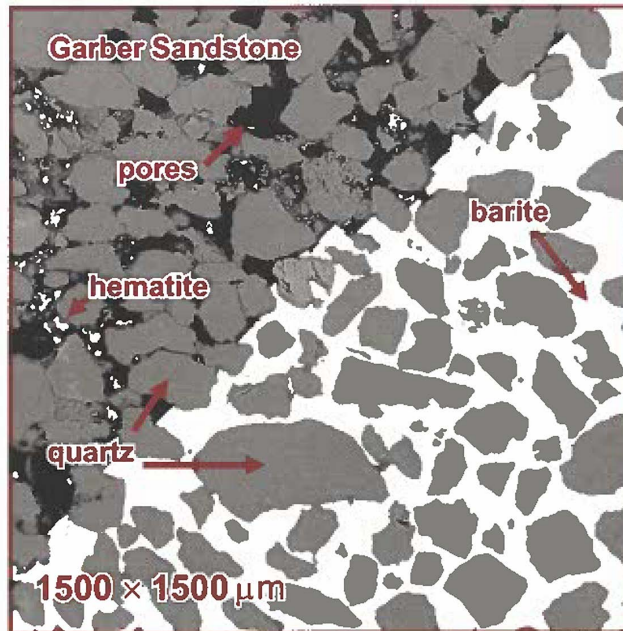
## History & Lore

The barite rose became the official state rock of Oklahoma when Oklahoma House Bill 1277 was signed into law in 1968. Noble, Oklahoma, was made the official rose rock capital (of Oklahoma, and by default, the world) via an “emergency” act of the Oklahoma House of Representatives in 1983.

A myth attributed to the Cherokees holds that the barite roses formed from the tears of their women and the blood of their men who were removed to Oklahoma from Georgia, 1838–39. Representatives of the Cherokee Nation disavow this legend, noting that barite roses do not occur on any of the lands granted to the Cherokees.

## Geology

The barite roses consist of radial and rosette sprays of disc-shaped barite crystals ( $\text{BaSO}_4$ ) that contain angular medium quartz sand ( $\text{SiO}_2$ ) derived from the geologic formation called the Garber Sandstone. A small quantity of hematite ( $\text{Fe}_2\text{O}_3$ ) imparts a reddish color to the roses.



An electron micrograph shows the boundary between a barite rose and the enclosing Garber Sandstone.

The roses formed when barite crystals precipitated from groundwater in the pore spaces between quartz sand grains within the Garber Sandstone. The roses reflect the shapes of the barite crystals, and hence they are cataloged as minerals.

Most barite roses range from 1 to 10 cm in diameter, though these coalesce into clusters weighing hundreds of kg.

The largest known single rose measures 51×56×53 cm and weighs 135 kg.



## How Old Are They?

The barite roses were deposited in fractures and along porous horizons within the Garber Sandstone some time after it was lithified (turned to rock). The exact age is not known, and roses could still be growing today.

## Why Only in Oklahoma?

Red Permian sandstones like the Garber (~250 million years old) are common throughout the world, yet barite roses are extremely rare. The origin of the roses, therefore, does not result from the depositional environment of the sandstone, but stems from some other uncommon feature of Oklahoma’s geology.



5 cm



5 cm