It is noteworthy that the ratio $CaO : Na_2O = 2 : 1$, but whether this ratio is essential cannot be determined from a single example; and in writing the formula it has been assumed that it is variable, as is the case in most related minerals. For the ratio $Al_2O_3 : (Ca, Na_2)O = 2 : 1$, found in this mineral, there is no parallel among the zeolites, where this ratio is practically always 1 : 1. The formula can be written in a manner suggesting a hydrated zoisite, tho not corresponding entirely. There is no particular reason for so writing it, except that a compound suggesting a hydrated zoisite is a not unlikely alteration product of a basic igneous rock. The correspondence is mentioned for what it may be worth and is shown in the following:

Echellite. . $(Ca, Na_2)\ (Al\ OH)_2\ Al_2\ (SiO_4)_3.3H_2O$

Zoisite . . . $Ca_2\ (Al\ OH)\ Al_2\ (SiO_4)_3$

THE CALCITE CAVE IN THE NEW YORK STATE MUSEUM

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New York State Museum

A reproduction of the famous Sterlingbush cavern has recently been completed in the New York State Museum at Albany. The size of the crystals, their unusual color and the ingenious method of construction of the exhibit make a short description of it worth while.

The Sterlingbush calcite crystals are well known to mineralogists. The cave from which they came was discovered during the process of quarry operations, after a blast had exposed a small opening 6 meters above the floor in the open face of a limestone quarry at Sterlingbush, Lewis County, northern New York, in 1906; it was first brought to the attention of scientists by Dr. D. H. Newland. The entrance consisted of a horizontal fissure that gradually widened to about one meter and extended a distance of 15 meters, leading into a chamber about 4 meters wide and 2½ meters high. Beyond this room the cave contracted, took a downward course, and came gradually to an end, as developed from further quarry work. The floor and lower sides of this chamber were covered with large calcite crystals, violet to lavender in color and partially covered with a thin secondary coating of aragonite. The crystals, as described in detail by Mr. H. P. Whitlock[1] are fairly simple, rhombohedron and base predominating, modified by smaller scalenohedral faces. Frequent penetration twins occur, especially in the larger crystals.

The upper sides and top of the cave were covered with much smaller, nearly colorless crystals, mostly rhombohedral in habit but partly scalenohedral. Members of the State Museum staff visited this locality and in a period of six weeks collected about 14 tons of crystals which were packed in 80 barrels, 14 kegs and 22 boxes. One specimen now exhibited in a special case in the museum consists of four large individuals twinned together, the combined weight being about 500 kilograms.

The reproduction of this cave, now on exhibition, has been made by Noah T. Clarke, museum technician, assisted by Charles P. Heidenrich. The door and brick work were torn away from the side of a small room that opened into the museum. In this room was constructed a strong steel framework about the same shape, and one half the size, of the original cavern. The top of this steel cage was securely fastened to an iron girder by a truss rod and turnbuckle in order to lessen the strain on the floor. Ten decimeters up from the bottom of the framework a solid flooring was laid, and upon this the larger crystals were set, in a mixture of plaster of Paris and excelsior, space being provided behind each large crystal for an electric light. Much careful work was done in removing the secondary aragonite by means of dilute acid and scrubbing brushes. Smaller crystals were then attached to the sides and top as follows: A hole bored in the crystal was filled with melted sulfur, a strong iron eyebolt was then inserted, and the whole allowed to cool. This method is sometimes used by quarrymen in picking up large blocks of stone with a derrick, and it is nearly impossible to remove the bolt by a steady pull. These crystals were then attached to the framework by means of the bolt and mortar made of plaster of Paris. Great care was necessary in fitting the various crystals together and it was three months before this part of the work was completed. Two mirrors, cleverly concealed in opposite corners, give the effect of the smaller, more contracted portion of the cavern.

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[1] *N. Y. State Mus. Mem.*, **13**, 78–81, 1910.

Provision was made for placing about thirty electric bulbs of from 20 to 60 watt sizes, behind the more prominent crystals. The crystals in daylight are a dull lavender or violet color, but by shutting off as much daylight and reflected light as possible, and using only transmitted light, a beautiful deep rose red to light pink color was obtained, depending on the thickness of the crystal and the intensity of the transmitted light. The side of the room was then walled in, leaving an opening 6 decimeters square thru which to view the interior. The wonderful beauty of the softly glowing, rose red crystals, which might be likened to an array of huge precious stones, more than compensates for the inaccuracy of this lighting arrangement, from the strictly scientific view point. Directly opposite the opening is a large deep rose red crystal, consisting of simple rhombohedron and basal pinacoid modified by small scalenohedral faces. This crystal weighs about 180 kilograms, shows no evidence of twin structure and is without doubt one of the largest, if not the largest, crystal of its kind ever exhibited.

A chemical analysis of these crystals gives the following impurities: Fe 0.08, Mn 0.12, and Mg 0.09 per cent.

The relatively high percentages of iron and manganese are rather unusual for calcite. As these two elements are no doubt present as carbonates, the complete analysis would be as follows:

$FeCO_3$	0.17
$MnCO_3$	0.25
$MgCO_3$	0.32
$CaCO_3$ [by difference]	99.26
Sum	100.00

The neodymium, which, as shown by Dr. Edgar T. Wherry,[1] is the cause of the color, is present in amounts too small for analytical recognition.

In boring the crystals it was found that some resisted the action of a bit much more than others. A careful chemical investigation failed to show any reason for this phenomenon; but no other impurities than those mentioned above being discovered, it must have been due to physical rather than chemical causes.

[1] Neodymium as the cause of the red-violet color of certain minerals. *J. Wash. Acad. Sci.*, 7, 143, 1917.