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EAGLE CAVE

by

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EAGLE CAVE ABOUT 10 MILES SOUTHWEST OF HIGHLAND CENTER ABOUT 5½ MILES NORTHEAST OF BLUE RIVER AND 6 MILES NORTHWEST OF MESCODA

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Eagle Cave is in the NW¼ of Sec. 19, T.9S, R.1W. The cavern is in the Lower Magnesian limestone which was deposited in the sea some 300 million years ago. At the close of the deposition of this formation, the land was uplifted from the sea and the limestone deeply eroded by streams. Upon this eroded surface the St. Peter sandstone was deposited. The sandstone was followed by the Platteville and Galena limestone, the Maquoketa shale, the Niagara limestone, and probably the Devonian limestone and shale, so that the Lower Magnesian was covered by at least 1,000 feet of sediments, all of which have been subsequently removed by erosion.

The cave was formed by the solvent action of underground water slowly dissolving the limestone. The water followed small and large cracks which were gradually enlarged by solution. As the process continued, the openings increased in length and width. The process was an exceedingly slow one, probably beginning first when the Lower Magnesian was subjected to erosion before the deposition of the later formations. Solution was halted and any cave formed may have been filled during the period of deposition of later sediments and during much of the time required to erode the great thickness of sediments overlying the Lower Magnesian. When enough cover had been removed to again permit the free movement of ground water, solution began again.

The cave, therefore, is the result of the removal of the limestone by the solvent action of ground water. Cave deposits are due to the deposition of lime carbonate by water. The forms produced are:

1. A stalactite is an icicle of lime carbonate hanging from the roof of the cave.

2. Stalagmites are built up on the floor by evaporation of water which drops from the roof, generally from the end of a stalactite.

3. A column or pillar is formed by the junction of a stalactite and stalagmite.

4. Sheets of lime carbonate are deposited on the ceiling, walls, and floor, where water spreads laterally before evaporating, thus forming a banded rock called Mexican onyx.

The following is quoted from a description of Eagle Cave, written in 1909 by E. C. Lange:

INTERIOR

Extent and Size of Passages, Rooms, and Grottoes.

The total length of the passages and rooms is nearly 1000 feet. I believe this is easily the largest cave of any kind in the state. The average width of the passages is about 70 feet, average height about 7½ feet. In a number of places, however, the width is over 100 feet and in two portions the height reaches 30 or 40 feet.

Special Features

Massive blocks of limestone on floor. One of the most noticeable features are the massive blocks of limestone which have fallen from above and lodged on the floor. One of these is at least 50 by 10 by 12 feet in size. Numerous other large slabs rest along the sides. Looking up as you move into the cave you notice other large masses of limestone fractured and partially dislodged still keeping their place in the roof. As the work of solution proceeds, these huge blocks are cut loose and gravity lets them fall to the floor below.

Cones of debris reaching from floor to ceiling. Another striking feature of the cave is the large cones of limestone and debris reaching from the floor to the ceiling. It appears that a small channel has been worn through the overlying rock and through this the material is washed in. I afterwards examined the top of the hill above one of these cones and found a small sink which confirmed my first impression regarding the origin of the cones.

Deep fissure. One especially extensive fissure occurred in the cave. It extended from east to west for about 100 feet, and up into the side of the cave for at least 40 feet. The fissure below had been sealed by calcite carried in by percolating water. I believe the fissure is simply the result of the beds breaking in consequence of unequal settling of a large mass of the formation. (The fissures cut the beds obliquely and not vertically as a joint would.)

Spring. One of the most interesting and welcome features of the cave is the little spring near the extreme end of the main passage. The basin is about a foot deep by three wide and contains clear, fresh water. Although the water contains considerable $CaCO_3$ in solution, it is suitable for drinking. The spring contains water the year around.

Work of Solution and Deposition.

Abundant calcite deposits. One wishing to study the work of solution and deposition in limestone caves can find no better place than this. Here the work of both is still going on under one's very notice. The large room containing the spring is especially suitable for this study, for here the water is constantly dripping from the thousands of stalactites which line the roof. The calcite deposits are of the most fantastic forms, and as they are wet, the reflection of the light adds to their beauty.

Stalactites and Stalagmites. There are thousands of stalactites and stalagmites in this cave. Many have been broken down by careless persons and

now strew the floor. Some of these are a foot or more in diameter and were too heavy to be carried away. The stubs remaining show the concentric structure very beautifully. The stalagmites were even more massive. One was over eight feet at the base and ten feet high. The water oozing through the rocks from the surface is saturated with mineral substances, chiefly $CaCO_3$ and $MgCO_3$ when it reaches the roof of the cave. A drop clinging to a pendant or rock, if it evaporates, leaves a circular deposit of carbonate of lime. By a continual repetition of this process, a thin tube at first forms. (Hundreds of these may be found in the cave at present.)

This tube thickens by further accretions into a stouter cylinder and finally into a conical stalactite. The drops coming too fast to be retained above fall to the floor below and make a broader deposit, which often gradually grows up into a blunt, firm stalagmite. There are numerous such in the cave. This building may continue until stalagmite and stalactite meet and form a column.

The rate of this deposition, if observed closely for a time, would give some idea as to the age of the cave. The growth of these forms varies greatly, however, according to the strength of the lime water, and the rapidity with which it evaporates.

It has been found that in Mammoth Cave stalactites have grown one inch in length in 25 years; stalagmites only $\frac{1}{4}$ inch in height in the same time. According to this standard, Eagle Cave is at least ten to fifteen thousand years old, as some of the stalagmites were ten feet high. (The rate of stalagmite formation in this cave is probably slower than in Mammoth Cave.)

Columns. In places, the stalactites and stalagmites have grown until they joined and formed large columns along the side of the cave. In several places such columns once extended from the floor to the ceiling but early

visitors broke them down with axes, so that now only the upper and lower stubs remain in place.

Water in Cave.

Several portions of the cave are very wet. The room containing the spring is fascinating on account of the constant dripping of the water to the floor below. There is little or no mud here, however, and one can walk easily.

Strata Exposed.

Everywhere within the cave the strata consists of pure, massive limestone, no other beds being visible.

Air in the Cave.

The air in the cave is remarkably fresh and pure and is at an almost constant temperature throughout the year (about 60° F.)

Life in the Cave.

Rabbits, skunks, and rattlesnakes have been seen and killed in the cave several times. (Mr. Charles Wade killed a large rattler near the entrance to the cave a short time before we visited it.)

A very interesting story is told at Blue River about two old hunters who drove a large, black bear into this cave. One of the two entered later with a large firebrand and drove the bear out where it was killed by his partner. As the bear was actually brought to Blue River, there seems to be some basis for the story.

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