

XXVIII. SOME STALACTIC FORMS OF MARCASITE

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The Lead and Zinc District of the Upper Mississippi Valley embraces parts of Grant, Iowa and Lafayette Counties in southwestern Wisconsin, northern Jo Davies County, Illinois and that part of Iowa along the Mississippi River in the neighborhood of Dubuque.

The zinc orebodies of this area occur in the Galena and the Trenton limestones of Ordovician age. Marcasite (FeS_2) and galena (PbS) are associated with sphalerite (ZnS) below the ground water level, and galena (PbS) and limonite ($2\text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$) are associated with "drybone" or smithsonite (ZnCO_3) above the ground water level. The major orebodies occur below the ground water level in underground water channels which are generally located in synclinal basins at a horizon near the base of the Galena limestone, at depths ranging from 100 to 200 feet below the surface. In the course of mining operations, some of these underground water channels have furnished beautiful specimens of calcite (CaCO_3) in the form of dog-tooth and nailhead spar, galena (PbS) in the cube and octohedral forms and sphalerite (ZnS) and marcasite (FeS_2) in the crystalline and stalactite forms. However it was not until 1915 that the stalactitic forms of marcasite as described in this paper, were observed by the mine operators of the district. At that time the Wisconsin Zinc Company opened up the C. A. T. and Longhorns mines, located east of New Diggings in Lafayette County, Wisconsin. These stalactitic forms of marcasite were discovered in each of these new mines about the same time. These occurrences were in cavities at places which were about 100 feet below ground water level in the C. A. T. mine and 50 below ground water level in the Longhorn mine, but in both cases within 20 feet of the base of the Galena limestone. The largest of these stalactitic forms of marcasite were about the size and shape of an ordinary lead pencil. However many others were of the shape of a corkscrew, still others were horn shaped, but all were of about the same diameter. All of these forms were seen in place on the roof and walls of the geode-like cavities, which also contained crystalline calcite, galena and sphalerite. At many places they were so numerous that they gave much the same impression to the observer as when looking at the back of a porcupine. They also extended from the walls and roof of the cavities in various direc-

tions, some attached to the walls being in almost a horizontal position as shown at (D) in Plate I. Most of them had a small tube extending through them. However others were solid in sectional area, whether due to secondary mineralization or as part of the original crystallization the writer is unable to say.

Many of these stalactitic forms of marcasite occurred in rows along small cracks in the roof and walls as was shown on breaking them away. There was also evidence as shown in Plate I at (A) and (B) that the tube extending through many of the stalactitic forms of marcasite connected with a similar opening or channel extending through the limestone roof or walls, and this tube was the channel through which surface water under greater

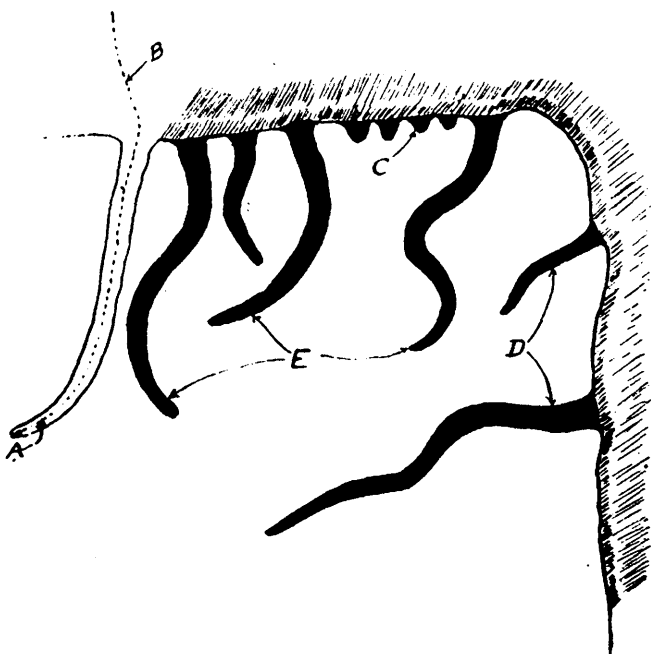


Plate I. Some Stalactitic Forms of Marcasite.

hydrostatic head than that produced by the ground water level, flowed into the opening containing the stalactitic forms. Perhaps these stalactitic forms of marcasite were produced by the deposition of marcasite around each of the small openings in the roof or walls through which water flowed into the cavity, resulting in the building of a tube of marcasite, the position and direction of which would extend in the direction of flow of the small stream of water under greater hydrostatic head entering the cavity. The presence of other currents of water within the cavity, deflecting the small stream under greater hydrostatic head, might account for the cork-screw shaped and horn shaped forms. Plate I at (E) shows some of the latter named forms, and (C) shows some of the forms without the tube like opening.

Ordinary stalactites are formed by dripping water above ground water level. The forms described by the writer occur below ground water level and are possibly produced by water under greater hydrostatic head flowing through small openings into a cavity already filled with water.

The stalactitic forms described by the writer were seen in place by T. Polhemus, D. I. Hayes, C. T. Hayden, A. M. Plumb and the writer, all of the organization of the Wisconsin Zinc Company at the time.

Specimens of these stalactitic forms of marcasite as well as similar but larger specimens of sphalerite may be seen in the mineral collection of the Wisconsin Mining School at Platteville, Wisconsin.