FLUID INCLUSIONS IN PYRITE

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The writer has called attention to the brine contained in the negative crystal cavities of the Joplin galena.[1] Newhouse has extended these observations to galena from this and other localities and also to sphalerite from several sources.[2,3] It is therefore of interest to note that fluid inclusions have also been observed in the ubiquitous sulfide, pyrite.

In crushing some rather perfect crystals of pyrite for chemical work, a special search was made for possible fluid inclusions among the fresh fragments resulting from the first coarse crushing. The detection of both cavities and spilled liquid is easy in galena and sphalerite, because the smooth cleavage surfaces render them obvious; it is very difficult in pyrite because of the irregular lighting effects obtained on the conchoidal fracture surface. In spite of this, both cavities and fluid were observed on a number of smooth fragments just after crushing.

Pyrite crystals from Bingham, Elba, and an unknown locality, (coarsely striated, one-inch cubes) have been examined. All show simple to complex interlineage cavities similar to those already described for galena. All also show evidence of fluid inclusions. These appear as localized films made visible on smooth surfaces because of Newton's interference fringes. These tarnish-like areas first appear as small continuous patches, later collecting into small microscopic spots, presumably as evaporation continues. In some cases, the films may be definitely seen to be localized in the regions of cavities. In most instances, however, the unevenly broken pyrite surface renders the detection of cavities near the film impossible.

The writer gained the impression from the small extent of film associated with cavities, that the cavities must be very incompletely filled with liquid. If this rather insecure observation be accepted, it suggests that the cavities in pyrite were originally gas-filled, the film now observable resulting from that part of the original gas which was capable of condensing to form liquid.

[1] Buerger, M. J., The negative crystal cavities of certain galena and their brine content: *Am. Mineral.*, vol. **17**, pp. 228–233, 1932.

[2] Newhouse, W. H., The composition of vein solutions as shown by liquid inclusions in minerals: *Ec. Geol.*, vol. **27**, pp. 419–436, 1932.

[3] Newhouse, W. H., The temperature of formation of the Mississippi Valley lead-zinc deposits: *Ec. Geol.*, vol. **28**, pp. 744–750, 1933.