

A Science Service Feature

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? WHY THE WEATHER ? Mailed December 17, 1931

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ICE CAVES

In many parts of the temperate zone there are caves that contain ice in summer, when hot weather prevails outside, but little or none in winter, when the air above is cold. The explanation in most cases, though perhaps not all, appears to be as follows:

Cold air is denser and heavier than warm. In winter such air flows into the cave from above. It is warmed by contact with the walls of the cave, grows lighter, and is displaced by a fresh supply of cold heavy air from outside, and this process is repeated until finally the walls themselves have been chilled to a considerable depth. When this stage is reached circulation ceases and a mass of cold, stagnant air fills the cave. In summer, as the air outside is warmer and lighter than that in the cave, it does not enter the latter. Thus through the summer the cave air is warmed only very slowly, by gradual diffusion and the conduction of heat through the overlying soil and rock.

In spring plenty of water from melting snowfields and other sources seeps through the ground after the latter has thawed out, and finds its way into the cave, where, on account of the presence of cold air, it turns to ice. By the end of summer the cave air has become warm enough to melt this ice, which therefore disappears. Still later in the year, though the cave air is again cold, there is no water in the cave to form ice, because, though there are mild periods in winter when the surface waters are not frozen, the water cannot seep through the frozen soil.

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