

A Science Service Feature

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? WHY THE WEATHER ?

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PIPES

A curious idea still persists that pipes are burst by the thaw which follows a cold spell rather than by the freeze itself. Obviously, it is the ^{expansion} of water in freezing that cracks the pipe, but the leak does not become evident until the ice melts and the pipe begins to drip.

It seems rather odd that hot water pipes freeze more readily than those carrying the cold water supply. According to some plumbers, hot water pipes burst at least four times as often as cold. Dr. F. C. Brown, with the assistance of Waldemar Noll, experimented with glass pipes to find whether the statement were true, and, if it were, to discover the cause.

Placing boiled water in glass tubes to simulate water in hot water pipes, and ordinary tap water in other tubes to correspond to cold water pipes, the experimenters exposed the pipes to freezing, using 50 pairs of tubes on seven occasions. Forty-four of the hot water pipes burst, but only four of the cold! It was noticed that the hot water pipes froze clear and solid, while the cold water ones froze with a core of slushy or bubble filled ice. These cold water tubes also showed a greater lengthening of the ice column than occurred in the hot water ones. Dr. Brown concluded that "the occluded air in ordinary tap water is responsible for the delay or absence of bursting of the pipes." This air makes the ice formed bubbly and therefore "more mobile, especially near the middle of the tube, so that until very low temperatures are reached the pressure is released along the middle of the tube to a certain extent." Water when heated loses much of its air, therefore hot water pipes burst much more readily than cold.

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