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A NEGLECTED FACTOR IN THE FORMATION OF ICE RAMPARTS

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An ice rampart is a ridge of material consisting of gravel, sand, and boulders which is pushed up on the shore of a small lake by the expansion

of the ice. This expansion of the ice covering is caused by temperature changes. Altho the process has been known for a long time, the complete explanation is not given in any of the text books and has never been published, so far as the author has been able to find.

In order that the process can take place, an ice covering several inches thick is necessary. When very low temperatures occur, the upper part of the ice sheet contracts, but the lower part, which is in direct contact with the water, remains at the same temperature as before or 32 degrees. Therefore the contraction results in the formation of wedge-shaped cracks with the point down. These fill with water and freeze. If now a sudden rise in temperature occurs, the upper part of the ice has its temperature raised to the freezing point and will expand, but because of the wedges the upper surface will now be larger than before. As a result, wedge-shaped cracks form in the lower part of the ice with the points up and these fill with water and freeze. This process will go on and sets of wedges will continue to form as long as considerable changes of temperature occur. As a result, the ice sheet will continue to expand and push outward on the shore.

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