

SECTION II.—GENERAL METEOROLOGY.

AIR CHIMNEYS OF ICE BELOW A WATERFALL.

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On the morning of December 12, 1917, the writer observed an unusual formation of ice below a waterfall created by a dam on the Oswegatchie River, near Gouverneur in northern New York. The air temperature on the morning when the observations were made was about -25°F . There had been freezing weather at this location for sometime preceding. The dam is of timber [fig. 1 not accurate in this] and is located at the crest of a natural rapid in a rough but shallow granite gorge. There was a slight depth of water wasting over the spillway of the dam in places. This depth ranged from zero to perhaps 6 inches. Owing to projecting rocks and piles of pulp wood below the dam (C in fig. 1) the flow of water away from the toe of the dam was greatly obstructed and there was opportunity for shore ice to build out from some of these obstructions, starting at a distance of about 20 feet

Although the writer has been around northern streams much of the time for 20 years, this is the first occasion when he has observed this phenomenon, although it would seem natural from the simple conditions under which it is produced that it must be of rather common occurrence.

CYCLONES, TORNADOES, THUNDERSTORMS, SQUALLS.

By ALFRED J. HENRY, Meteorologist.

[In response to a query from an honored correspondent the Weather Bureau recently submitted the following elementary remarks on cyclones and on tornadoes, with the purpose of clearing away once more the usual misconceptions regarding the distinctions meteorologists make between these storms. As all our stations repeatedly encounter the kinds of questions here brought up and answered, the

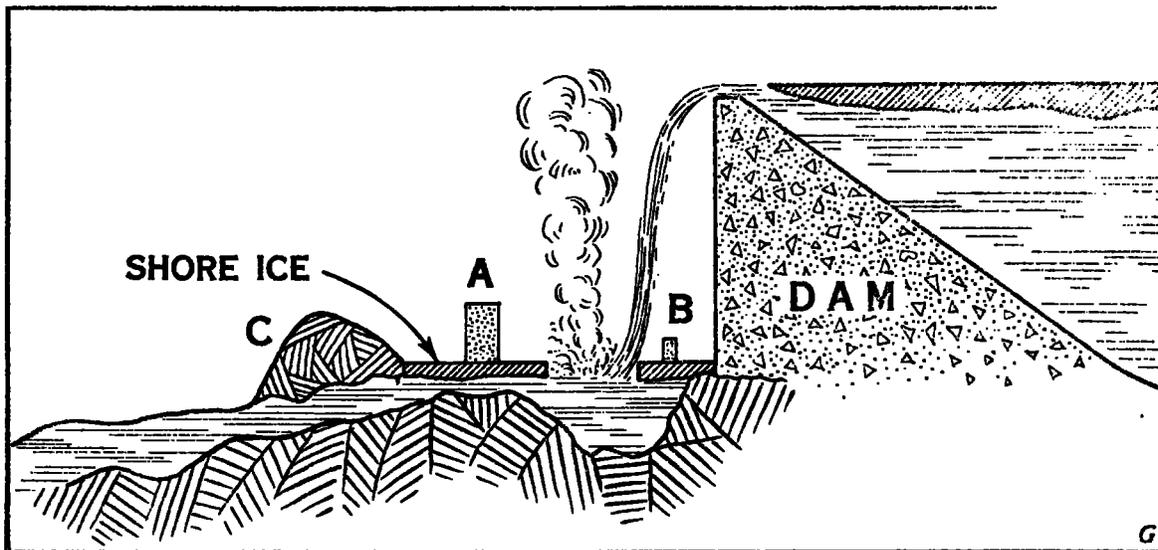


FIG. 1.—Illustrating formation of air-built ice chimneys, A and B, on shore ice below a dam on the Oswegatchie, near Gouverneur, N. Y., December 12, 1917. Obstructions of rock and pulp wood at C. Dam should be of timber.

below the dam and reaching out over the pool to within, say 10 feet, of the toe of the dam. In several places there were vertical chimneys of ice of circular cross section built up on this shore ice. (A, B, in fig. 1.) Where, owing to a higher crest, water did not flow over the dam, shore ice had also built out from the toe of the dam and here again the ice chimneys were formed. The tallest of these chimneys was about 4 feet high and 6 or 7 inches inside diameter, the walls apparently being $\frac{1}{2}$ inch to 1 inch in thickness. The largest ice chimney was 10 or 12 inches in diameter, but this one was not over 2 feet high.

Apparently the overflow from the dam carried air down with it into the pool. The turbulent water rising under the shore ice permitted the escape of this air, first through air holes. Mist and drops of water expelled with this escaping air froze around the margin of the air hole, gradually building up an ice chimney. In the case of the shorter chimneys, mist and particles of water could still be seen escaping.

remarks are published in their entirety that all may use them when needed.—EDITOR.]

What is a tornado? Students of weather phenomena define a tornado as a violent windstorm accompanied by rain, hail, thunder, and lightning, in which the air masses whirl with great velocity about a central core while the whole storm travels across the country in a narrow path at a considerable speed. These storms have a destructive diameter of from a few hundred feet to half a mile and sometimes more. When seen from a distance the tornado has the appearance of a dense cloud mass with one or more pendant funnel-shaped clouds which may or may not reach to the earth. In the larger tornado clouds east of the Mississippi the funnel cloud may not be noticeable unless the observer be situated in a favorable position for observing it, but the whirling motion of the air is the same whether the funnel is visible or not.

(1) Tornadoes almost invariably occur in the southeast quadrant of a cyclone, that is the barometric con-