Ordinary Ice.

1. Water frozen is rock. It may be rock of nearly pure ice, or a conglomerate or sandstone with a cement of ice. In this state its movements are those of rock-masses, and the effects depend partly on the material cemented.

2. The freezing along shores envelops stones and earth that lie above and below the water's surface or that may fall from adjoining bluffs. With a rise of the water, masses thus loaded may float off with the current, or may be driven up the land by a wind, and make heaps or ridges of stones. These effects occur on the borders of both rivers and lakes, and also along seashores. On the Newfoundland coast the shore-masses of ice, loaded with stones and bowlders, become very thick, and when struck by an ice-pack moving down from the north, are sometimes pushed a hundred yards up a shore; and their blows against the rocky bluffs often do great execution. On the other hand, cables and anchors at times make part of the cemented materials that are carried away from the shore (S. Milne, 1876).

3. Ice formed about stones over the bottoms of streams or lakes is called *ground-ice* or *anchor-ice*. It may thicken until the stones are floated, and drift away with the current down stream or up the shores.

Dams are made across rivers at narrows (as at the Delaware Water Gap) by ice-masses, when the ice-layer over streams becomes broken up, occasioning great floods over the regions above.

4. The impervious layer of ice and frozen earth, which sometimes covers many thousands of square miles in cold regions, gives waters derived from precipitation or melting easy flow from the hills to the rivers, absorbing nothing, and usually at a time when evaporation is at a minimum; and thus the greatest of river floods are produced. Further, waters beneath an icy crust, receiving accessions from meltings where rocks outcrop and become heated in the sun, may gather, in consequence of the confinement, into underground streams, and these streams will come to the surface over any spot not frozen, as the cellar of a house, and other places protected from the cold.

5. The ice-layer on a steep slope, enveloping, it may be, much gravel or earth, may slip down as a mass, in a creeping way or abruptly, when the material underneath is much wet, making landslides.

The columnar structure characterizing ice is partly the occasion of its sudden disappearance from lakes in the spring. Totten states (1859), respecting the phenomenon on Lake Champlain, that in the progress toward melting, the ice (one to two feet thick) becomes changed into an aggregation of vertically prismatic crystals, somewhat irregular, which touch only at points and on the edges; and though still appearing to be solid a cane may be shoved through it. In this state, a heavy wind makes the ice of the whole lake vanish in a few hours. The thickness of the disappearing ice may be known from the broken ice left in prismatic fragments fringing the shores.

http://www.geology.19thcenturyscience.org/books/1896-Dana-ManGeol/README.htm