

# The Canadian Engineer

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## Spillways in Nova Scotia Proven Inadequate

Record-Breaking Floods Last Month Destroyed Bridges, Dams and Roads—  
Hydro-Electric Plants Temporarily Put Out of Commission—Serious Failure at  
Grand Lake Storage Dam—Computation of Flood Discharge on Several Streams

By K. G. CHISHOLM

Assistant Engineer, Dominion Water Power Branch, Halifax

**H** EAVY floods occurred over the western portion of Nova Scotia on March 13th and 14th, 1920. In the district known locally as "the valley," the floods attained a severity unprecedented within the memory of the oldest inhabitant.

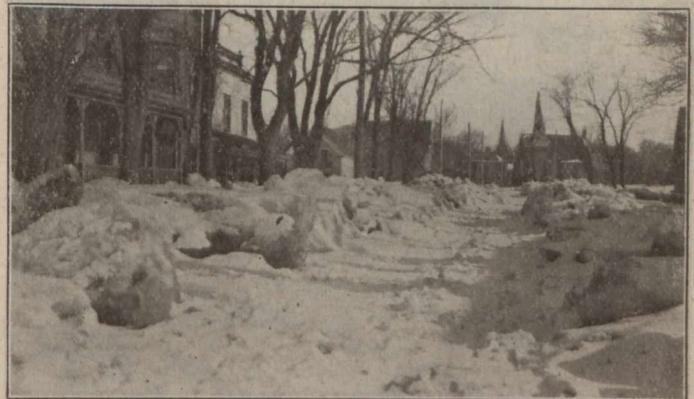
On Friday, March 12th, the temperature rose from a few points above freezing to 50 degs. F.; Saturday and part of Sunday remained warm, and a heavy fall of rain occurred during these three days. Table 1 gives meteorological observers' reports, in connection with which it should be noted that the recording stations at Wolfville and Kentville are subject to much lighter precipitation than the high surrounding country feeding the streams.

The winter's accumulation of snow, amounting to between 2 and 3 ft., was quickly melted and—augmented by the heavy fall of rain—ran off the frozen ground into the streams with great rapidity.

In "the valley" district the rate of run-off was expedited by the topography. This district embraces a valley from 1 to 3 mi. wide which extends from Minas Basin to Annapolis Basin, draining east by the Cornwallis River and

water from ice jams caused a major portion of the damage. In most cases, however, the floods were uninterrupted, open-water run-off, as the ice went out at a comparatively early stage of the flood.

The streams started to rise early Saturday morning, March 13th. Before midday, many of the streams had swept themselves clear of ice. The rise continued all day Saturday and reached a maximum early Sunday morning, after which



STREET IN BRIDGETOWN, N.S., SEVERAL DAYS  
AFTER FLOOD HAD RECEDED



HIGHWAY BRIDGE AT BRIDGETOWN, N.S.

west by the Annapolis River, both tidal streams. There are high plateaus on each side of the valley, rising abruptly to elevations of 500 and 600 ft., from which descend a number of small, precipitous streams. The topographic conditions are, therefore, such as to increase the rate of run-off.

At several places, notably Kentville and Truro, the rivers were unable to clear themselves of ice, and the back-

it gradually subsided to average high water within two or three days.

The damage was heavy. Bridges were swept away, dams carried out, roads and railways submerged, orchards ruined and livestock drowned in barns which were thought to be well beyond the reach of extreme high water. There was also considerable damage to hydro-electric developments, and the inadequacy of existing spillways was clearly demonstrated.

At the Gaspereau hydro-electric plant, the flood topped the bulkhead section of the dam by about 10 ins. and ran over the roof of the power-house. The solid concrete dam escaped damage, as did the temporary wooden power-house, although great anxiety was felt at the peak of the flood. It is the intention to increase the height of the bulkhead section of the dam by 2 ft. and to replace the wooden power-house with one of concrete.

At the Nictaux Falls plant of the town of Middleton, the original spillway, 132 ft. long and 2 ft. deep, had already been increased 1 ft. in depth by removing a 12-in. timber bolted to the top of the concrete. Even this increased capacity was insufficient. The flood ran over the top of the whole dam and washed out the earth from underneath the wooden intake flume. The bottom of the flume dropped out