

Pieces of water pipe and lead covered cables taken from these districts by Mr. Cambridge were examined, and showed without doubt that holes and breaks in them had been caused by electrolytic action.

Photos of a few of the destroyed piping are shown.

The damage reported in districts Nos. 1, 2, 5 and 6 is caused by the very bad condition of the bonding on Portage, Notre Dame, and William Avenue, and Sherbrooke Street tracks. On Portage Avenue, from Hargrave Street towards Sherbrooke, where the roadbed is unpaved, the bond wires, which are Nos. O, B, and S, soft copper wire with bonding cap terminal, give readings in equivalent feet of rail of 20 to 60 feet—this shows very bad condition of bonding.

At several places the bonds are uncovered, and many broken bonds were noticed. Current is leaving the tracks in Sherbrooke Street, South Portage, and Notre Dame west of Sherbrooke, (rails are positive to pipes), entering the pipes, flowing down these until close to Main Street is reached (along Main Street from river to C. P. R. subway, pipes are positive to rails), the current leaves the pipes to rails, telephone cables on other pipes causing the damage reported—it accounts also for the trouble reported in the T. Eaton Company's store. (Report of City Engineer, March 2, 1909.)

In connection with district No. 3, that is, in the district around the car barns on Main Street close to the river, the rails on Main Street are bonded to the water pipes. The heavy water mains on this street carry a large part of the railway current till it reaches Water Street, Notre Dame Avenue, and Portage Avenue East, that is, district No. 4, the stray currents are here given back to the telephone cables, which are bonded to the negative bus bars of the substation on Mill Street, and also to the intricate network of high pressure mains and service pipes lying in this district. This accounts for the trouble reported in the McIntyre block. In this connection, the writer desires to state that on May 26, in company with the city electrician, this building was visited. In the basement a recording amperemeter was connected between a water main and a telephone cable. Charts of current readings were kept. At the time of the visit 50 amperes were recorded, and the water pipe was positive to the telephone cables. With the statement reported by our city electrician, that such a condition involves danger of fire, the writer does not agree, although the conditions there are remarkable enough that conditions might be assumed under which fire could be possible. The remedial scheme referred to above, that of bonding the tracks with water and gas pipes, although it may afford local protection, and was considered good practice some time ago, will greatly increase the amount of stray currents and should not be encouraged.

C. Cambridge