

## ELECTROLYSIS IN THE CITY OF WINNIPEG.

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In January, 1909, the writer was instructed by the Council of the City of Winnipeg to report upon the danger to the watermains and telephone cable system that might exist in the city, due to the return currents of the Winnipeg Street Railway Co., and to submit recommendations dealing with improvements of the present street railway system, so that electrolysis, if it existed, would be eliminated. A report was made following the above instructions, and was published in the *Canadian Engineer*, August 20th, 1909, *Canadian Electrical News*, September, 1909, and in other technical periodicals.

There has been a demand for this report from different quarters, and it is reprinted with some additions, hoping that it will prove serviceable to those who have to consider similar problems in connection with the grounded returns of electrical railway companies.

THE AUTHOR.

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*Preliminary.*—The Winnipeg Electric Railway Company, in operating their street railway system, use the rails as a return for the current operating the cars. In order to make the rails a continuous conductor, and thus secure a good return path for the current, the rails are bonded at the rail joints with copper bonds. Besides this the rails are connected to the station negative bus-bars by return copper feeders, bonded to the track at different points of the system.

This is the usual method of street railway return construction, but electric railway companies using this system, that is, using the rails as the return circuit for the returning currents, are a serious menace to piping and cable systems in proximity to the tracks, if the methods of constructing the above described rail return are such that the railway companies are unable to control their own currents, but use the piping and lead-covered cables as part of their return circuit.

*Cause of Electrolysis.*—Currents from the railway system, if the track returns are in bad condition, having to find their way back to the power house, will flow from the rails which are in contact with the ground, through the ground, and such metallic constructions in it that offer the least resistance to the flow, and after flowing through these (gas pipes, water mains, lead covered cables, etc.) towards the station, will return through the ground back to the rails or to return conductors in the vicinity of the