Memo to Dr. Eve From A. N. Shaw.

STRAY MAGNETIC FIELDS DUE TO TRAMWAYS SYSTEM.

In 1909, fluctuating electric currents of about five amperes, which seriously disturbed all magnetic instruments in their vicinity, were found to flow between the water system which enters the building from the Sherbrooke Street side and that which enters from the north, These currents were investigated and measured over a period of several months. In order to eliminate the stray fields and also to avoid the serious damaging effects of such currents, insulating washers were installed in the pipes, and all contacts between the systems throughout the building were separated. This partially eliminated the trouble, leaving a potential difference between the systems which varied in the daytime from 10 to 20 volts.

In August 1919, it was found that the washers had broken down and that numerous new contacts between the systems had been made. The currents were greater than in 1909, but were not measured on this occasion. (They were sufficient to affect a Thomson galvanometer to such an extent that it could not be used in any part of the southeast basement laboratory.)

These effects are probably caused by the Bleury or the St. Catherine Street Tramway system return circuits. Between two and four o'clock in the morning, when these circuits are open most of the time, it was found in 1909 that the magnetic effects became negligible.

It is probable therefore that a closer approach of the cars to McGill would render necessary several expensive measures of protection.

Besides the magnetic effects due to the currents passing along the water pipes, there are magnetic effects due to the currents passing through other neighbouring conductors, and to the operating current itself, which would be appreciable at the distance of University Street.