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GRADE SEPARATION.

(By W. H. Breithaupt, M. Can. Soc. C. E.)

To be read before the General Section, 18th March, 1910.

Two bodies cannot occupy the same space. Of two intersecting lines of traffic on the same plane neither can be continuous; each must be intermittent, must stop, or change direction, while the other passes. And while each line may be naturally intermittent, may consist of detached units, if its units pass at variable and unrelated intervals, liability for two units, one on each line, to meet at the point of intersection remains unchecked. If either line is fixed in direction, as on a railway, and cannot turn aside, the danger of interference increases; and increases more if both lines are so fixed.

The fact that the only safe crossing of street or highway and railway, or of railway and railway, is in placing one above the other, and thus giving each a free and unobstructed course, is an axiom. No so-called protected crossing—a grade crossing with gates, signals, derails and other appliances, or any of them, operated by attendants, or automatically—has been found to be ultimately safe. Separation of grades has in addition to safety, the further great advantage of elimination of delay and of maintenance and operating cost.

This paper aims to give existing conditions governing the practicability of grade separation.

The physical laws for grade separation are summed up in two:

1. The structure carrying the upper line of traffic must be sufficiently high above the lower traffic way to clear all objects passing on the latter;