

employers complained that they were held liable for the least error committed by any of their employees, and that the law fixed no maximum limit of their liability. They also alleged that trials by jury were prejudicial to them, because the jurors allowed themselves to be guided by sentimental considerations instead of impartially weighing the evidence. They complained further that they were exposed to vexatious lawsuits for amounts altogether out of proportion with the damage suffered, and that, even when they succeeded in having these actions dismissed, they still had to pay their own costs, which were generally very high.

The workmen, on their part, contended that the law as it stood was unfair to them in obliging them to prove the fault of the employer, or of those for whom he was responsible, especially as in many cases the only available evidence was that of their fellow-workmen, who were thus called to testify against their employer. They also maintained that statistics showed that in nearly fifty cases out of a hundred, accidents were due to fortuitous causes, to superior force, or to undeterminable causes, and that in all such accidents the law allowed the workmen no indemnity. They further complained that their limited resources did not allow them to follow the employer through the numerous appeals from one court to another, and that it often happened that a final judgment was not arrived at before several years after the institution of the action.

Mr. Walton gives one instance of the length to which juries would sometimes go under the old law in finding liability established. The workman, a man of twenty-two years of age, had been warned by the foreman not to touch a machine, but in spite of this prohibition did so and received an injury. The fact that the foreman was aware that his order had been disobeyed, and had not taken the means to enforce obedience of it, was held enough to render the employer liable. The verdict, awarding reduced damages, was sustained by the Court of Appeal on the ground that the jury were entitled to judge as to the questions of fact, and that, although the verdict might not commend itself to the Court, it was nevertheless one which twelve reasonable men were entitled to find.

The Quebec Workmen's Compensation Act, Mr. Walton thinks, is a frank acceptance of the new principle of "professional risk," a theory which has been the subject of much discussion during the past twenty-five years in almost all the countries of Europe. It rests upon the simple idea that every workman is entitled to compensation for injury caused to him by an accident in the course of his work, quite apart from the consideration whether the accident was caused by fault on the part of the employer.

Experience has shown that, in the conditions of modern industry, a large number of accidents to workmen inevitably occur, and, upon this theory, the cost of making compensation for them—so far as it is possible to compensate such losses in money—ought to be a charge upon the industry, just as much as the cost of the machinery or the fuel.

Mr. Walton traces briefly the practical considerations which have induced the legislatures of so many countries to accept such a principle. The evolution of society, he says, has been upon the same general lines in all the great manufacturing and commercial centres. All alike have become vast, noisy workshops, full of whizzing wheels, of live wires, and of dangerous chemicals and explosives.

Before the days of steam and electricity, and dyna-

mite, he continues, the workman could, as a general rule, protect himself by the exercise of ordinary care. His tools were few and simple. None of them moved except when he handled them, and no one was in a hurry. It is, therefore, not to be wondered at that the old law gave the workman no claim for damages unless some fault, at least of omission, could be clearly brought home to the employer. But the situation has completely changed. Under modern conditions millions of workmen pass their lives in continual danger. They have to deal at close quarters with complicated machines, to handle terrible explosives, to run the risk of coming in contact with "live wires"; in a word, to face a thousand perils. Even the strictest care cannot save them. A boiler may burst or some other accident occur, the precise cause of which can never be discovered. Hundreds of lives have been lost by this terrible accident anonyne, as it has been called. In many kinds of employment the workman knows that he is exposed to mysterious and sudden danger. He has to take the risk. It is inherent in the nature of the occupation. The master may have the best and newest plant. He may spare no expense and no vigilance in adopting every means for protecting his men. The workman may always be on the watch. But all this cannot prevent the accident. Is it fair that the workman should bear this professional risk? His employer may not be negligent, but, at any rate, the work is being carried on for his profit. It is idle to say that the workman is paid at a higher rate because his work is dangerous. The iron law of supply and demand compels him to take such wages as he can get in the state of the market. Mr. Walton's commentary will be perused with much interest.

GRADE SEPARATION.

W.H. Breithaupe, M. Inst. C.E., M. Can. Soc. C.E.

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 also an axiom. It has become an axiom. No so-called protected crossing—a grade crossing with gates, signals, derrails 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.

2. The grade on either traffic way, approaching the crossing, must be practicable for the traffic thereon.

The maximum height of loaded vehicles and any objects thereon on city streets or country highways has been ac-