

index scale, by which means the chance of errors from minute divisions is obviated.

The projector of the pneumatic telegraph is not in possession of any experimental results on a practical scale by the electro-magnetic, or by the hydraulic, telegraphs, employed at any considerably extended distances, or of their continued operation for any long period of time; nor can he offer much decisive information, of a practical nature, analogous to the operation of the pneumatic telegraph on these points; the following circumstances may, however, be referred to:—

There has been upwards of twenty years experience in the transmission of gas for illumination through conduit pipes of various dimensions. In several instances, the gas has been supplied at distances of from five to eight miles, by low degrees of pressure. As one proof of great rapidity of motion, it has been observed, that when any sudden interruption in the supply has occurred at the works, the extinction of all the lights, over large districts, has been nearly simultaneous. Another instance of the great susceptibility of motion which frequently happens, is the flickering motion of the lights at great distances when water has accumulated in the pipes.

The only experience in the transmission of atmospheric air through conduit tubes, which applies more particularly to this subject, may be referred to at three railway establishments, viz. Edinburgh, Liverpool, and Euston-square, London. In these establishments, air tubes, from $1\frac{1}{2}$ to 2 miles in length, have been employed for the purpose of giving notice when a train of carriages is ready to be drawn up the inclined plane by the stationary engine at the summit, so that it may, without delay, be put in motion. This notice is communicated by blowing a current of air through the tube at the foot of the inclined plane, and sounding an organ pipe, a whistle, or an alarm bell, at the stationary engine. It will be satisfactory to know, that this operation has been regularly performed from two to four years, without one single failure or disappointment.

It may further be noticed, that a trial was made with a tube of one inch in diameter, very nearly two miles in length, and returning upon itself, so that both ends of the tube were brought to one place:—the compression applied at one end, was equal to a column of seven inches of water; and the effect on the index at the other end, appeared in fifteen seconds of time.

Laws have been propounded by eminent men on the expenditure of aeriform fluids through conduit pipes, and of the resistance of the pipes; but these are not strictly applicable to the present question. Under all circumstances, it seems desirable that experiments on a practical scale, at extended distances, should be resorted to, as the most satisfactory guide for carrying into effect telegraphic communications of this kind.

Lond. Mech. Mag.

Prevention of Railway Accidents. By WILLIAM RUSSELL.

In the humble hope of drawing more efficient pens to the subject, I offer the following hints:—

1. When a person is in danger of being run over by a train, if he had the presence of mind to get into either of the *outside spaces*, it would be safer than in the *middle one*, (a presumed reason for which will be seen in the 5th article.)

2. Whether the individual be in the *middle space*, or in *either of the lines*,

he should immediately *fall flat on the ground*; it would, in the former case, prevent the commotion of air consequent on the rapid motion of the train, from drawing any portion of his dress towards the carriages; and in the latter case, the entire train would roll over him without doing him the slightest injury, as was exemplified in the case of a Pole, an officer on the Great Western Railroad, who, sometime ago, escaped unhurt, with the exception of a hot cinder falling from the furnace and slightly scorching his face: it is consequently *preferable to lie on the face; the hat should also be thrown off*, as there might otherwise be a chance of it coming in contact with some projecting point of the train.

3. It is therefore *safest*, when the individual cannot get to either of the *outside spaces*, (which is undoubtedly the best) to throw himself *flat on the ground*, in the *middle space*, or in *either of the lines*.

4. It is consequently an obvious duty which the various companies owe to humanity, to have their carriages so constructed that there would be sufficient space from the bottom of each (including cross beam or iron work) to the bottom or bed of the lines, that a man of the largest dimensions might lie there unhurt.

5. *The middle space is particularly unsafe* for any one to stand on, when there are two trains going in contrary directions and passing each other at the same instant: in proof of which, a poor man, about a fortnight ago, going to his daily labour, and having to cross the railroad at Kinton, near Harrow, whilst a train was approaching from the Euston-square terminus, instantly ran to *the middle space*, thinking, no doubt, that *there* he would be perfectly safe—but another train, at almost the same instant of time, coming up in a contrary direction, caused such a *commotion of air*, first from being agitated by the one train from east to west, and next this agitated air being met by the other train from west to east, that the poor man must have been, as it were, in the midst of a powerful *whirlwind*, and entirely under its impulse: we may, therefore, without hesitation, come to the conclusion, that his dress must have been blown about in every direction, and consequently come in contact with one of the carriages—thus drawing him towards inevitable destruction. The *commotion of air* here hinted at, may be supposed *hypothetical*; but let a reflecting mind pause before it comes to this conclusion; let a rational being ask himself what effect a body, of the weight and magnitude of an ordinary train, rushing through the air, at the rate, let us say, of 30 miles an hour, or $14\frac{2}{3}$ yards in one second; and another similar body passing by in an opposite direction at the same velocity, through a fluid so subtle as atmospheric air is known to be, and he cannot but be convinced that the agitation must indeed be terrific: hence the poor fellow lost his life. I would say then *avoid the middle space by all means, or, if you prefer it, fall flat upon the ground, with the face downwards*.

6. Might not some simple contrivance, say of the form of an arc of a circle, or that of the fin of a fish, with a spring attached to it, be so placed on either side of *the tender or first carriage*, as to throw off to the right or left any body that might accidentally come in contact with the same?

7. There ought to be the greatest possible vigilance enforced on those officers whose duty it is to see that no impediments be permitted to the free ingress and egress of the trains; and upon no account whatever should their attention be directed to any object unconnected with their duty, more especially when there is a train either on the point of start-

ing, or when near any of the places where they stop. The following account shows the listlessness—I might say heartlessness—of one of those men. “Lord Litchfield and three of his friends were nearly killed about month ago: the *hour* of the Manchester train was *changed without any notice*, which is a very common occurrence; and when his lordship got to Birmingham, it was gone. His lordship felt very much annoyed, as is royal highness the duke of Sussex and a large party were coming to dine at his seat, Ranton Abbey; he asked whether he could have an engine for himself and party, which was immediately provided. Away they went at great speed, but, owing to the *negligence of a policeman*, in not turning a plate, they were carried with great force *off the line*, and upset into a pit. They were all much injured.”

8. In tunnel transits, I would recommend fire works (say a small Catherine wheel) to be placed on the first carriage, to be lighted at the moment of entry, and so constructed as to burn during the entire transit; that the lights should likewise be of one colour for the left hand line, and of a different colour for the right hand one: this would, to a certainty, be the means of preventing such serious accidents as that which happened at the tunnel running from Chalk Farm to the vicinity of Kilburn, when Pickford’s train and another came so furiously in contact as to demolish some of the carriages, besides seriously injuring many, and alarming all, of the passengers.

9. In conclusion. If methods such as I have now stated, or others that may be more efficient, be not adopted, the public will, or at least ought, to demand, I say, *emphatically, demand*, that *the speed be lessened*. Let the companies look to this; it would certainly not, in a pecuniary point of view, be to their interest to lessen the motion—let them, therefore, apply other remedies.

Ibid.

Mechanics’ Register.

Substitute for the Sun.

The newly invented light of M. Gaudin, on which experiments were recently tried at Paris, is an improved modification of the well known invention of Lieutenant Drummond. While Drummond pours a stream of oxygen gas, through spirits of wine, upon unslaked lime, Gaudin makes use of a more ethereal kind of oxygen, which he conducts through burning essence of turpentine. The Drummond light is fifteen hundred times stronger than that of burning gas: the Gaudin light is, we are assured by the inventor, as strong as that of the sun, or thirty thousand times stronger than gas, and of course ten times more so than the Drummond. The method by which M. Gaudin proposes to turn the new invention to use is singularly striking. He proposes to erect in the land of the Pont Neuf, in the middle of the Seine, and centre of Paris, a lighthouse five hundred feet high, in which is to be placed a light from hundred thousand to a million gas pipes strong, the power to be varied as the nights are light or dark. Paris will thus enjoy a sort of perpetual day; and as soon as the sun of the heavens has set, the sun of the Pont Neuf will rise.

Ibid.

Wheatstone’s Electrical Telegraph.

On the bank by the side of the Great Western Railway, the directors are now laying down iron tubes containing wires, for communicating with the various stations, by means of Wheatstone’s electrical telegraph. The advantages, if it succeed, will be immense; the expense, we have heard, is about £100 per mile.

Ibid.