THE IMPORTANCE OF TRAMWAYS.

Tramways are of the greatest importance in large centres of population as a cheap, convenient, and ready means of communication from one part of a city to another, both as to long and short distances. The experience where tramways have been laid down shows that they tend not only to increase the value of property in the city, but also in suburban districts. They promote the extension of such suburbs by leading to the erection of residences for the wealthier citizens, and also dwelling-houses for the working-classes in healthier localities ; and in this respect their value as a sanitary agent cannot be over stated. The facilities afforded by the extension of tramways, allowing people to travel quickly and cheaply to and from the busier parts of the city, as well as their tendency to spread out the population, and thus prevent over-crowding (which is one of the sanitary difficulties of all large towns) render them of great public benefit commercially and sanitarily.

Besides their value in cities, there can be no doubt whatever that they will gradually come to be of equal importance for country districts. By the adoption of tramways on many of our turnpike roads where villages have become dormant or deserted owing to railway communication being too far distant to preserve the life which once existed, vitality would be restored; and the time will soon come when they will be laid down along all the important turnpike and public roads in the country. Tramways laid on such roads at a slight cost per mile, and worked by mechanical power, would not only give communication at a cheap rate, but be sure to pay those who embarked their capital in such an undertaking.

Besides the saving of the difference in the cost of laying down a perfect tramway on turnpike roads, as compared with a railway, the elaborate and expensive machinery for working the latter would be dispensed with. No stations or their necessary attendants would be needed, as the tramway train would be worked solely by the conductor, coming back very much to the system of the village carrier and the stage coach, with the improved means of locomotion ; and now that engines can be got to work gradients of 1 in 13, the traffic over even the worst of our highways could be profitably and expeditiously carried on, and a stimulus would be given to the agricultural, commercial and manufacturing interests of the country to an extent even greater than has been the case by the introduction of railways.

Another important advantage in having tramways on our turnpike roads would be that the expense of maintenance for ordinary traffic would be merely nominal, and that question which exercised the minds of landlords and tenants so much when the prudence of abolishing tolls was before the country, would be practically solved, as the expensive machinery of the old toll system would not only be saved, but the tax for maintaining such roads would be greatly reduced, and the development of tramways along roads, and even into farm steadings, with their cheap means of transit, would do more than anything else that has yet been devised to encourage the improvement of land that at present lies waste, unsheltered, undrained and badly cultivated, and which, no doubt, affects prejudicially our climate and seasons, and brings upon our agricultural communities such depressions as have, during these past years, been experienced.

Another valuable adaptation of the tramway system would be, in our great North-West, its convenience and suitabillty over the ordinary railway system, as feeders to the main trunk lines, would be enormous. It would open up the country districts cheaper and quicker than any other known system, and give farmers advantages similar to those situated nearly on the main road.

If this view of the question were properly considered by the Government, and acted upon, the North-West, in all corners, would soon become habitable, instead of a howling wilderness or prairie.

ELECTRIC CABLES.

The attempts which are made to devise a practical and cheap system of underground telegraphs continue to be numerous, but the actual progress which is made is not very marked. A history of underground telegraphs would indeed be a long list of failures, commencing in 1837 with the so-called "fossil" telegraph of Wheatstone, which consisted of bare wires placed in grooves in lengths of oak scantling. Most of these failures have not been due so much to actual defects in the inventions as to the inability of the inventors to push their commodities, owing to force of circumstances. The use of gutta-pecha shows no signs of falling off, and no substance has yet been brought into the market which has been proved to be a substitute for it.

Great attention is now being paid, says the *Electrical Review* (London) to lead-covered cables, the insulation of the latter, as in the Berthoud-Borel system, being due to resinous substance, which are far cheaper than gutta-percha. Provided the lead covering remains intact, there is no reason whatever why such cables should not remain good for an indefinite period. In certain soils lead is practically imperishable ; but, again, where the clay is present, rapid decay occurs. About ten years ago a cable consisting of a cotton-covered wire placed in a lead pipe, the latter being filled with paraffine wax, was laid in Windsor Park in a clay soil ; in a very short time this line became defective, and on examination it was found that the lead covering had been eaten into holes, which, by admitting moisture, rendered the wire useless ; in this case the paraffine wax was not able to effectually coat the copper core. Excellent as paraffine wax is as an insulator, it has the great defect that it shrinks very considerably on cooling, and is therefore extremely liable to crack ; indeed, most substances of this nature possess this element of uncertainty, and when used as insulators they practically can only be relied upon as "separators" to prevent metallic contact between the latter and a metal sheathing, the sheathing being the medium which keeps moisture out.

Lead, as a protecting covering, necessarily means considerable weight, and as a means of preserving single wires could hardly be adopted to any great extent. Multiple cables would have more chance of success, though the fact that the units of which they are built up are practically inseparable is a disadvantage ; and, moreover, if moisture does penetrate, it means that nearly all, if not all, the wires will become defective. For very special purposes, however, the lead-covered cables should prove to be all that can be desired. The use of paraffine oil as an insulator in the Brooks system has yielded excellent results, and is an undoubted success, but we are inclined to think that more satisfactory results might be obtained from a semi-fluid material, *i.e.*, one which would not be liable to become dispersed by leakage ; but which would at the same time have the property of settling down if by any chance it were disturbed, and thus sealing up accidental faults. There seems at present but little chance of india-rubber or gutta-percha being superseded for submarine purposes, but the employment of a cheap yet efficient substitute of these materials would probably give a renewed impulse to such telegraphy, and would richly reward the inventor.—*Ex.*

MRS. LOUISA REED STOWELL has just been elected a member of the Royal Microscopical Society, of London, England. Mrs. Stowell is the third lady ever elected to this Fellowship. She is the only lady instructor in the University of Michigan, and is the author of several treatises on microscopical subjects.