

of it an electric tramway would have been in operation between these two centres long ago, and it is evident that before long the need of a more frequent service will become so great as to necessitate a removal of the present legal obstruction, unless a service of the same general character is provided by the Railway Department. In course of time, in all probability, as a result of the growth of the population, an electric service on both the road and the railway will become a necessity. There is, of course, no question as to the advantages of electricity where frequent service is required—this is a matter of common knowledge; but at the same time, although the necessity may be great, it will be found that the actual conversion is postponed until the matter becomes an acute one, unless facilities in the way of obtaining a supply of power are available. These delays may not have the same direct retarding influence as delays in main-line electrification, but the argument in favour of a provision of electric power is equally valid.

AGRICULTURAL RAILWAYS

Another branch of electric haulage which may possibly have an important influence upon the destinies of New Zealand is the construction of light railways, by which I mean railways constructed with grades usually adopted for a good class of road—or, in other words, a tramway, which shall serve the country in the same way as a tramway serves a town and its suburbs, except that farm-produce would be conducted over it as a matter of course. These would not take the place of main or branch railways, but would act as feeders thereto. They would relieve the roads of heavy traffic, and would promote exchange between town and country and form an important link between producer and consumer. It is possible, of course, that there is no immediate use for this class of railway in New Zealand, but if there is no system of general electric supply the matter cannot be put to a test, as it would never pay to provide a separate power-station for each line. In any case it is quite certain that there is a future for rural railways where the population is closely settled, as we have the example of Belgium before us, and it is only a question of time before the necessity for them will arise in New Zealand.

ELECTRICITY AND COAL-MINES.

One would be apt at first to conclude that colliery-owners would have no use for electric power transmitted from elsewhere, yet the contrary is the case. In my own experience I have found the collieries amongst the first and most profitable customers of a power-supply undertaking, notwithstanding the fact that coal from outside the district was used to fire the boilers in the power-generating station. Large collieries in South Wales, Lancashire, Yorkshire, and the Midlands derive their electric-power supply from bulk supply services over long transmission distances, and collieries on the north-east coast of England, having an aggregate output of 20,000,000 tons of coal per annum, are entirely dependent on the north-east coast power-supply system for a supply of electricity, and it is calculated that a saving of 1,000,000 tons of coal per annum is effected thereby.*

It is sometimes assumed that the development of hydro-electric power is inimical to the development of coal-mines, and that the saving in coal which is effected by the substitution of electricity for steam-power means that so much less will be mined or imported. The contrary is, however, the case, because any great measure of economy when effected increases prosperity, and increased prosperity invariably increases the demand for coal.

It is suggested that the slack coal now produced will remain unutilized if certain power plants now using the slack cease burning fuel and take a supply of power from a hydro-electric source. My own view is that increased production which will result from a cheap and unrestricted supply of electricity will put up the demand for slack coal for auxiliary purposes; that there will always be a market for mine-slack that is normally produced, especially when improved methods of burning the slack are adopted.

A method is now coming into vogue for steam-raising purposes which has long been in use in cement-mills and in the open-hearth process of steel-making—viz., that of pulverizing the coal and forcing it under the boilers in the form of a jet by means of a fan. It is quite probable that this method will be largely used for marine and railway purposes in future, and experiments have been made with a view to adapting the method to the requirements of both marine engines and steam locomotives. It would seem that the next step in the process of economizing fuel will be in the direction of pulverizing the slack and using it in the way described.

Slack coal of very inferior quality is treated on a large scale in Germany for its chemical contents, and also made into briquettes of a comparatively high calorific value, but it is doubtful if such processes can be operated with advantage in New Zealand.

The erection of a power-house in the Huntly district has been suggested as a suitable source of electric power for the Auckland district, the plant being designed to burn the slack coal produced in mining the more marketable coals. There are several objections to this course. In the first place, if full advantage is to be taken of the cheapness of the slack the output of electricity would be dependent upon the slack produced, and the development of the power-supply business regulated accordingly. On the other hand, if the power business is to be conducted in such a way as to be free to expand and to keep pace with developments unhampered by conditions as to the quantity of slack produced, the power-station must be located in such a position that it can draw upon several coalfields, especially in view of the fact that the quality of the slack produced varies considerably in calorific value and other properties affecting the method of burning. My own experience is that slack even when obtained from the same seams varies even from week to week in such a way as to interfere with the combustion of the coal and the production of steam. I have known of a power-station located in one coalfield drawing its supplies of coal from another coalfield as a matter of economy and to facilitate the operation of the plant.

* "Interim Report on the Electric-power Supply in Great Britain": Ministry of Reconstruction, Cd. 8880, p. 27.