

Notes.

Mr. J. A. F. Aspinall, General Manager of the Lancashire and Yorkshire Railway Company, England, gave particulars of the conversion from steam to electric working of the line between Southport and Liverpool, the cost of which was £20,000 per mile, or about three and a half times the cost of the installation of a steam locomotive service. The weight of electric equipment of the trains is not less than the corresponding weight of locomotives. Electric traction was not adopted for the sake of economy but to increase the receipts. From this point of view the results have been satisfactory, as the traffic has largely increased, but the operation is more costly than locomotive power. The paramount reason for the conversion was the urgent necessity of decreasing the crowding of the Liverpool terminus during the busy hours of the day. The handling of steam trains necessitated four shunting and eight signal operations, whereas two shunting and four signal operations suffice for the electric trains. The line equipped is double, and carries a very heavy passenger traffic, Southport being a favourite watering-place.

Mr. A. Wilson, Assistant to the General Manager of the North Eastern Railway, England, supplied information on the use of electric traction on the suburban lines of Newcastle-on-Tyne. The cost of electric traction for the month of February, 1905, was as follows: Mileage of trains, 92,541; mileage of cars, 245,938; average number of cars per train, 2.75; average cost of power per car mile, 1.601d.; engineer's pay per car mile, 0.297d.; conductors' pay per car mile, 0.217d.; total cost of traction per car mile, 2.115d.; total cost of traction per train mile, 5.7d. Mr. Wilson, however, admitted the difficulty in making comparisons with steam traction. He maintained that electric working permits of a better utilisation of the existing lines, and experience has proved that the improved services which follow as a general rule lead to increased receipts. The North Eastern are apparently satisfied with the change, but I ascertained that the company bought current at specially low rates, and had not to incur a heavy capital expenditure on power.

The Lancashire and Yorkshire Company generate their own current, which I was informed cost the company much more than the North Eastern Company's current cost that company. In England there appears to be reluctance on the part of the railway companies to go in largely for conversions from steam to electric, largely on account of the very heavy expenditure involved. They are also holding back on account of the improvements which are being produced, which may result in a much greater economy of installation and working.

In America electric railways are numerous, and they are stated to be working very satisfactorily. Very costly experiments are being made by the two great manufacturing companies—the General Electric Company, at Schenectady, New York, and the Westinghouse Company, at Pittsburgh. I was present at a trial of an electric locomotive built by the General Electric Company at Schenectady. This locomotive worked at a voltage of 600, and collected the current from a third rail. Locomotives of this type, but without the most modern improvements, have been working successfully for ten or more years on the Baltimore and Ohio Railway. They were introduced to work a series of tunnels through which a heavy traffic passed, the smoke nuisance having become intolerable.

I was also favoured in being present when visiting Pittsburgh at a trial of the Westinghouse Company's new locomotive, known as the "Westinghouse-Baldwin single-phase alternating-current locomotive." It is the first of its kind constructed in America, and is designed for a current of 25 cycles and a trolley voltage of 6,600. Its weight is 136 tons, which is carried on six axles. Horse-power normal, 1,350. When working at nominal full load output this locomotive will develop a draw-bar effort of 50,000 lb. at a speed of ten miles per hour, but draw-bar pulls of from 80,000 to 85,000 lb. have been recorded by the dynamometer car. This record, I think, entitles it to rank as the most powerful locomotive, steam or electric, in the world. The Westinghouse Company claims that the successful completion of so large and powerful an alternating-current locomotive, without the usual series of developments through gradually increasing sizes, which is ordinarily required when so great a problem is undertaken, marks a distinct advance in the production of electrical apparatus for heavy-traction work, and now that the first important step has been taken should certainly prove the forerunner of the use of electric traction on trunk-line railways which has so long been looked for.

Considerable developments are also taking place in the same direction on the Continent and elsewhere, but I am of the opinion that in the matter of the electric working of railways that American capital, energy, and inventive genius will lead the world.

In New Zealand, a country so lavishly endowed with water-power, the value of electricity for working the railways cannot be over estimated. It is a question which should have early consideration, and certain lines on which electric current can be obtained should be so equipped, the locomotives now being used on such lines being utilised on lines which must remain steam for all time. I am assuming that electric power would only be used where cheap water-generated current would be available.

When in America I arranged with the principals of the Westinghouse and the General Electric Companies to keep me posted up in the development of the electric locomotive.

SECTION 3.

9. WORKING.

Lighting, heating, and ventilation of trains.

Reporters.—America—Mr. C. B. Dudley, Chemist, Pennsylvania Railroad; other countries—Mr. Cajetan Banovits, Superintendent of Rolling-stock and Motive Power of the Hungarian State Railways.