

# GENERAL ELECTRIC REVIEW

## THE WORLD'S RAILWAYS AND ELECTRIFICATION

Three of the articles presented in this issue of the REVIEW deal with the important subject of steam railroad electrification, those by Mr. Beeuwkes and Mr. Hare having special reference to the Chicago, Milwaukee & St. Paul Railway, and the third by Mr. Armstrong bearing upon the relation of railway electrification to the conservation of our natural resources.

In connection with these papers, a brief glance at the electrification situation may be of interest. There are in the Americas today roughly 358,000 miles of railroads operating with steam locomotives as compared with about 217,000 miles in Europe and 117,000 miles in Asia, Africa and Australia. The electrified divisions of steam railroads in the United States which may properly be classed as trunk line electrifications aggregate approximately 2500 miles, or more than double the steam road conversions in Europe.

Soon after the successful operation of Sprague's first trolley car at Richmond in 1887, electrical enthusiasts began to aspire to the electrification of our existing railroads. The Baltimore & Ohio put the first steam road electrification into operation in 1895 hauling heavy passenger and freight trains through a series of tunnels from the Camden Station northward a distance of 3.7 miles. The next step of importance was the equipment in France of the Paris-Orleans Railway in 1900 with electric locomotives for subway terminal service.

In the early 1900's, several steam roads in England and United States resorted to multiple unit trains for heavy suburban passenger service, but the next large installation of electric locomotives was on the New York City terminals of the New York Central and the New Haven Railroads.

Up to this time electrification had been adopted mainly to obviate the smoke nuisance

and to facilitate the handling of heavy suburban passenger traffic. Economic reasons were advanced as secondary considerations and it was difficult to secure sufficient operating data to bear out claims of more economical operation for electric equipment.

In 1913, however, the Butte, Anaconda & Pacific Railway purchased electrical equipment to supplant the heavy steam locomotives used for hauling ore trains between Butte and Anaconda with the definite intention of reducing operating expenses over and above reasonable charges against the increased investment. As was shown in tables published in the November 1914 issue of the REVIEW, the economies due to electrification exceeded the predictions of engineers, and this showing largely influenced the decision of the directors of the Chicago, Milwaukee & St. Paul Railway to electrify its 440-mile section of mountain railroad.

The actual operating data from electrifications abroad have been negligible and the character of all earlier projects precluded definite comparisons, so that data on the Butte, Anaconda & Pacific Railway have been especially illuminating. In this issue we are publishing the first data secured from the electrical operation of the Chicago, Milwaukee & St. Paul Railway which will doubtless receive the careful scrutiny of both railway operators and electrical engineers. From these preliminary data there is every reason to believe that figures for a longer period will be wholly favorable to electric train haulage.

That the results are eminently satisfactory to the railway officials is attested by the decision of the directors to make further conversion, as recorded in Mr. K. R. Hare's article in this issue. The description of the projected extension from Othello to the coast cannot fail to create the impression that the railway officials are relying upon electrification to solve the most trying problems of railway operation.