A REVIEW OF THE THEORY OF NARROW GAUGES AS APPLIED TO MAIN TRUNK LINES OF RAILWAY

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THEORY OF NARROW GAUGES

AS APPLIED TO

MAIN TRUNK LINES OF RAILWAY.

By SILAS SEYMOUR,
GENERAL CONSULTING ENGINEER.

NEW YORK:
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1871.

RAILWAY GAUGES.

LETTER FROM MR. MARSHALL O. ROBERTS.

TEXAS PACIFIC RAILROAD COMPANY,
OFFICE, CORNER WARREN AND WEST STREETS,
NEW YORK, *Sept.* 23, 1871.

HON. SILAS SEYMOUR,
20 *Nassau street, New York.*

MY DEAR SIR,—I have the honor to send you herewith, the report of our Chief Engineer, General Buell, on the subject of narrow gauges, which is of deep interest to me as the President of the Texas Pacific Railroad, a *great trunk line.*

Before deciding so important a matter as the adoption of a gauge for our road, I feel the necessity of obtaining all the information that can possibly be procured on this subject; and knowing your great experience whilst acting as State Engineer of New York, as Chief Engineer of the N. Y. and Erie Railroad, and other prosperous enter-

prises, and as Consulting Engineer of the Union Pacific Railroad, I am induced to solicit your written opinion, as to whether a first-class railroad, of equal speed, comfort to passengers, and capacity for freight, with those possessed by the gauges now in general use, can be built upon a narrow gauge; and if so, what gauge would you recommend?

By giving me your views, at your earliest convenience, you will confer a great favor on,

Yours very truly,

MARSHALL O. ROBERTS.

A REVIEW

OF THE

NARROW GAUGE THEORY.

MR. SEYMOUR'S REPLY.

No. 20 Nassau Street,
New York, *Oct.* 16*th*, 1871.

Dear Sir,—Having received your communication of the 23d ultimo, and the accompanying report of your Chief Engineer, during a somewhat protracted stay in Canada, I have taken the liberty of deferring an answer until my return to my office in this city.

I have read with some care the report of your Chief Engineer, General G. P. Buell, in which he recommends you to adopt a gauge of 3 ft. 6 inches in preference to the 4 ft. 8½ inch, or the 3 ft. gauge, for the Texas Pacific Railroad, extending from the Mississippi Valley to the Pacific Ocean, a distance of about 1,500 miles.

The confidence and earnestness with which your Chief Engineer presents his views and urges his recommendations upon this important subject, show, beyond a doubt,

that he is entirely honest in his convictions; and they are therefore entitled to full and fair consideration.

He admits, in his report, that your road will necessarily come in competition with two other grand trunk lines to the Pacific. And he claims that it "already has advantage of the other routes in climate, distance, and economy of construction." He also claims that "the whole subject hinges on the three points—speed (which is time), capacity, and economy;" and that these three points are secured by the adoption of a gauge 1 foot 2½ inches narrower than the gauge of the two other grand competing lines; and which has been in general and successful use throughout the civilized world, during the past half century.

The five following reasons are given for recommending the 3 ft. 6 in. gauge, in preference to the one of 4 ft. 8½ inches:—

"*First.*—That in the construction of the road-bed, etc., the difference will be 30 per cent. of cost of narrow gauge.

"*Second.*—That in the construction of the superstructure the difference will be 45 per cent. of cost of narrow gauge.

"*Third.*—That, with proper construction of rolling stock, a speed of 35 to 45 miles per hour can be attained with perfect safety.

"*Fourth.*—That in the construction of rolling stock the difference will be 50 to 55 per cent. of cost of narrow gauge.

"*Fifth.*—That in the loaded trains of mixed freights and cars, on the 3 ft. 6 in. gauge, the percentage of dead weight to load will be about $\frac{47}{100}$; while in the similar train on the broad gauge road, the percentage of dead weight to load is about $\frac{75}{100}$."

I cannot concur with your Chief Engineer, either in the premises which he assumes, or in the conclusions at which he arrives. Although I will admit, that, assuming everything else to be only equal, if either one of the reasons which he gives can be satisfactorily proven true, he will have gained his case.

The great difficulty, however, will be found to rest in obtaining this satisfactory proof. Take, for example, the construction of the road-bed. I should want to see two parallel lines of equal length, and running over precisely similar ground, constructed, one for the wide, and the other for the narrow gauge, having equal margins for right of way, drainage, slopes, bermes, etc.; and then the difference in cost could be correctly ascertained. But, in the absence of such a test, I cannot admit that there is anything like the difference claimed for this one item, in favor of the narrow gauge.

But as this test never has, and probably never will be made, it only remains to show, by *indirect* or *negative* demonstration, that the proposition cannot be true.

If I understand the proposition (which is stated somewhat ingeniously), it is, that if the narrow gauge road-bed costs $10,000 per mile, the wide one will cost $13,000, the difference being $\frac{3}{13}$, or about 23 per cent.

Perhaps I cannot illustrate my idea of the error better,