

**A COMMENTARY ON
CRITICISMS CONCERNING
AMERICAN V. ENGLISH
LOCOMOTIVES, PP. 3-54**

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A Commentary on Criticisms Concerning American V. English Locomotives, pp. 3-54 by W. W. Evans

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W. W. EVANS

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A COMMENTARY

— BY —

W. W. EVANS,

— ON —

CRITICISMS CONCERNING

American v. English Locomotives.

WITH

TESTIMONY BY ENGLISH ENGINEERS.

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A LETTER BY W. W. EVANS,
BEING A COMMENTARY ON MR. MAXWELL'S
CRITICISMS.

To the Honorable

SIR JULIUS VOGEL,
AGENT-GENERAL for NEW ZEALAND, London.

New, York, February 14, 1880.

Sir.—I have the honor to lay before you a few comments on parts of a parliamentary document sent to me from New Zealand headed *American and English Locomotives*.

This Document contains a long and able letter by Mr. R. M. Brereton, late Engineer-in-Chief of the Great India Peninsula Railway, a letter written by myself to Mr. Higinbotham, Engineer-in-Chief of the Railways of Victoria, Australia, and not intended for publication; a criticism on the above letters by Mr. J. P. Maxwell, of New Zealand, and some opinions on engines by Messrs. Neilson & Co., of Glasgow, and the Vulcan Foundry Company of Lancashire. As the letter of Mr. Maxwell contains some errors of fact as well as opinion, I beg permission to offer, in as brief a manner as possible, a few comments on his criticisms.

To combat ignorance and prejudice is a very thankless and unsatisfactory duty to perform, as it appears to be an inherent principle in the brain of man "to try to believe what he wishes to be true." Mr. Maxwell undertook a duty that he was sadly incompetent to perform, simply because he had never seen an American locomotive and knew nothing about them, and being a Civil Engineer he could not be expected to know much about locomotives of any kind. He has, however, written a long

letter, stated some things that are not based on facts, and jotted down a considerable amount of special pleading and fallacious argument. Most American Civil Engineers would "come to grief" if they attempted to write on English locomotives, for the simple reason that they know nothing about them. Mr. Brereton has written a long and very able letter in connection with railway economy, and deserves credit instead of severe criticism. He has given piles of facts and valuable data, and expressed opinions that any unprejudiced mind was sure to arrive at with such evidence as he had. He was well able to judge correctly on the subject he wrote on, as he had many years of experience in connection with railways, first in England, then in India as Chief on one of the most important lines of railway in the world, then for some years in the United States, and now in England again. Surely a man with such experience should carry some weight in his train when he expresses an opinion, and particularly when it is understood that he is an educated English gentleman, living in England and not in any way connected with any American enterprise or industry. He simply wished, without fee or reward, to give to railway progress a few facts from his storehouse of experience and knowledge, the same as Fox, McDonnell, Colburn and others had done before him, in the elaborate and clever papers they wrote and read before the Institution of Civil Engineers of England, and for which they were so highly complimented.

I have no knowledge of how my letter to Mr. Higinbotham came to get into print. It was a hurriedly written private letter, written to prove one single point, namely, that American engines were not short-lived affairs, and if that letter is not a full and convincing proof of that fact then I submit that figures are deceptive, and that there is no use in referring to them in discussion or argument.

It was asserted by an English writer on political economy, that any man who could make two spears of grass grow where only one had grown before, was doing a benefit to all mankind. In the railway world it has been conceded that the true measure of railway economy is the cost of carrying a ton a mile, and that any one who can, by any device or system, produce this result, is adding something to the progress of the age in which he lives. The whole matter of railway progress and economy is wrapped up in this one item of cost of carrying a ton of goods a mile, and a passenger a mile. It has often been

asserted by 'croakers,' afflicted with weak-thinking organs, that the superiority of the English railway system is proved by the fact that the ratio of expenses to receipts in England is less than 50 per cent., while in America it is more than 50 per cent. Any railway investigator can readily see that in a country where labor and materials are high priced, and where the railway tariff of charges is low as in America, the ratio of expenses to receipts must be higher than in England, where labor and materials were low priced and the tariff of charges high.

We claim in America that we have solved the problem of cost of carrying on railways a ton of goods a mile more finely and obtained more satisfactory results than has ever been obtained in any other country in the world. I will give the figures of cost of carrying a ton a mile for a series of years on the Pennsylvania Railway, and if any one can match them with better figures on any railway in England or Europe I will be delighted to see them:

PENNSYLVANIA RAILWAY. GOODS TRAFFIC COST IN CENTS PER
TON PER MILE.

Years, . . .	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878
Cost, . . .	1.82	1.54	1.25	1.20	1.00	0.87	0.886	0.857	0.719	0.616	0.582	0.552	0.483

It must be recollected that the through traffic of this railway is all carried over the Allegheny Mountains, on gradients of 1 in 55, and many curves of less than 1,000 ft. radius.

The fallacy of the argument in reference to the ratio of expenses to receipts proving anything, is shown when I state the facts that, in 1859, the expenses of the Grand Trunk Railway of Canada were 2 per cent. more than the entire receipts, and that in the same year the ratio of expenses to receipts on the Panama Railway were only 23 per cent., and that the same for 22 years, from the year it was finished to the last year I got the statistics, 1873, the average was 32 $\frac{4}{5}$ per cent., and this, too, with enormous expenses for labor and materials; but the tariff of charges was still more enormous.

Mr. Maxwell commences his letter by saying that there is but little information in Mr. Brereton's or Mr. Evans' letters that conveys any practical intelligence to a professional man, that they contain vague generalizations that are calculated to mislead an unprofessional man, and that the subject is taken up as if it was new. I submit that papers that are full of facts and few

of opinions are of service to all professional men, and cannot mislead any unprofessional man, who is a reasoning creature and has a brain above that of a "non-compos."

Mr. Maxwell complains that we do not give all the data of each engine, train and road. Such data would swell an ordinary letter to the size of a book. As Mr. Maxwell calls for some more explicit data, I will give some in another part of this letter, as I am desirous to give the truth, simple and full.

Mr. Robert Stephenson, once said to me at his own table in London, when I was offering some theory as a point in discussion, "Don't give us theory, give us facts; we have got past the age of theory." I admitted the strength of his argument, and have vividly recollected his bringing me up with a "round-turn" ever since. I will give Mr. Maxwell some facts to ponder over, but first let me correct some of his mistakes that are calculated to mislead the *professional man*, as well as the unprofessional man.

Mr. Maxwell says that the American engines cost £ 2,800, each. These engines cost on board ship, with tender, \$8,500 each: equal to £ 1,717. With insurance, freight, commissions, and a liberal allowance for cost of landing and erecting in New Zealand added, I make these engines to cost £ 1,998 each. I sold the bills on London to pay for them, and got one pound sterling for each \$4.94½. I also engaged the freight, so I am giving facts that are within my knowledge. There is a very wide difference between £ 2,800 and £ 1,998. How Mr. Maxwell came to make this big error, I leave to him to explain; but having made such an error, I would like to ask if there is not a possibility of his having made an error in the other direction, when he put down the engine he used, in his comparison, as costing *about* £ 2,700. I wonder what limit in sterling figures Mr. Maxwell gives to the word "about." It appears to be about £ 802, or say 40 per cent. of the whole in the case of the American Engines. Mr. Maxwell makes reference to an American Engine on the Iquique Railway, in Peru, and calls it the "Evans Engine;" saying it was too costly to work, and that the road was worked by Fairlie Engines. I beg to say in answer, that I never had anything to do with the engine he calls the "Evans Engine." I did not design, order, inspect, or receive it. I would here add that, in that particular case, it mattered not if the engine was good or poor, it was doomed before it left here. Mr. Fairlie had won the affections of the

"Brothers Montero," the owners of the Iquique Railway, and by some "hocus-pocus" had made them believe that the engine he called his, was something wonderful and destined to regenerate the railway world. The Monteros were "innocents," and allowed their money-bags to flow freely into the pockets of Fairlie. Their faith was supreme, but their money-bags had a bottom. Fairlie put his faithful Henchman, a Mr. Clemenson, on the road as locomotive superintendent, and from that day until the Monteros were nearly ruined and had to transfer their interests to an English Company, there was nothing believed in, "cracked-up," or allowed on that railway but the so-called "Fairlie Engine." Before Mr. Fairlie and his man Clemenson were known on that railway, the Monteros, thinking that one railway was the same as any other railway, and an engine an engine—the same as one goose is like another goose—bought, as they would barrows or bars, two ready-made locomotives of Stephenson & Co. Finding they could not run their sharp curves, as they were useless, they then bought two "Mogul Engines" I had built for mountain railways in Peru. For one whole year, and up to the advent of Fairlie & Clemenson, these two engines did the entire work of that railway, and almost without repairs, for they had no shops or tools. Mr. Clemenson soon remedied this state of affairs. There was not much time lost in burning the flues of these engines, and then they were run out by the sea-side to allow the spray of salt-water to finish the job. I must do Mr. Clemenson the justice to say that before he was kindly relieved of all authority on that railway, he had not only ruined all the American Engines but all the so-called Fairlie Engines also. A merchant in Lima, said the Fairlie Engines were the best he ever heard of, because they ruined the rails, they ruined themselves, and the more they got the more they wanted, and the more they ordered the more his commissions were.

Mr. Maxwell is in error in saying that the Iquique Railway is worked by Fairlie Engines. When that railway passed into the hands of some English merchants, there was hardly a Fairlie Engine on the road fit to run. The new company ordered a new set of engines of another type.

An eminent German railway manager says he has no engines on his lines that cost as little for repairs as the Fairlies, for he takes good care to never use them. When I found that there was such a hue and cry set up against the American engines on

the Iquique Railway in Peru, and such a blast of "music in the air" about the wonderful performance of the Fairlie engines on that Railway, I made an offer to Mr. Fairlie, through the editor of *Engineering*, that I would give him the price of a Fairlie engine if he could produce authentic data that any one of his engines on that road ever did, on any single occasion, as much duty in proportion to weight on driving-wheels, as the American engines had done, as a regular duty on that railway every day for a year. This offer was never accepted.

In 1870 Mr. Fairlie had some experimental trials of his engines in England in the presence of some foreign Counts and other noble railway experts. They declared the results to be wonderful, and were more than anxious to sign the strongest certificate that could be drawn. The data of these trials was sent to me. Wishing to see how it compared as to duty performed at two government trials (one in Peru and one in Chili, South America) with engines under my direction (the trials being under the eyes and certified to by clever and experienced English engineers). I reduced the data of all down to one common basis of comparison, namely, foot-pounds of work done per hour per ton of weight on driving wheels, in moving train alone exclusive of engine. The results were as follows :

Fairlie engine "Little Wonder," Festiniog Railway gauge, 1 ft. 11½ ins. equal to 9,024,739 ft. lbs.

Fairlie engine "Progress," Mid-Wales Railway gauge, 4 ft. 8½ ins. equal to 9,272,339 ft. lbs.

Rogers American engine "San Bernardo," Southern Railway of Chili gauge, 5 ft. 6 ins. equal to 41,587,020 ft. lbs.

Rogers American engine "Conquistador" Arequipa Railway of Peru gauge, 4 ft. 8½ ins equal to 25,377,544 ft. lbs.

A full table of these comparisons was published in *Engineering*, Nov. 11th, 1870.

I will send you a copy of these comparisons and also a pamphlet in reference to this much-lauded Fairlie engine. Mr. Fairlie has never been very desirous to put his engines on any railway, unless he could "saddle" his Locomotive Superintendent also on the railway. Mr. Meiggs, the railway contractor of Peru, gave Mr. Fairlie an order for one of his engines, after much solicitation, merely to test it. Mr. Fairlie wished Mr. Meiggs to build his Trans-Andean railways with "breathing places" for his engines. Our engines have now worked those railways for years without lung-complaints, these railways hav-