

and American engines, so that I could compare them. This was in 1874. The figures were as follow for 1873, and give averages for the year of all the engines they had :—

ENGLISH RAILWAYS.						Miles.
London and North Western	...	...	...	...	...	15,415
Midland	...	...	...	...	...	18,808
North Eastern	...	...	...	...	...	17,290
Great Western	...	...	...	...	...	18,320
						4)69,833
Average of all						17,458
AMERICAN RAILWAYS.						Miles.
Boston and Albany	...	...	...	...	...	24,500
Erie	...	...	...	...	...	27,550
New York Central	...	...	...	...	...	26,933
Pittsburg, Fort Mayne, and Chicago	...	...	...	...	...	31,737
						4)110,720
Average of all						27,680

The above gives an average of 10,222 miles for the American engines more than for the English. This is decimally 58 per cent. greater duty, and it was done on inferior tracks, in a more severe climate, over steeper gradients and sharper curves, and with heavier loads. It must be admitted in making this statement that the English engines no doubt showed a greater average speed than the American, but, with this admitted, they should show greater average mileage in the year.

Let us look at some more average mileages in 1876. The Illinois Central Railway had 202 engines. They averaged 27,819 miles in the year. See *Engineering*, March or May, 1876. In 1875 the Central Pacific Railway had 203 engines; they ran 5,676,030. This gives an average of 27,960 miles. The report of the Missouri, Kansas, and Pacific Railway for 1876 gives the engine mileage of that railway as averaging 37,811. *Engineering* for November gives mileage of that railway as averaging 37,811. *Engineering* for November 10th, 1871, pages 305 and 310, gives the average mileage of engines in England on twenty railways for six months as 9,168 miles; this for the year is 18,336. *Engineering* for May 11th, 1877, gives the average mileage of twenty-two railways in England in 1875 as 17,934. In McDonell's paper, No. 1469, on the repairs and renewals of locomotives, read before the Institute of Civil Engineers, January 16th, 1877, there are many statistics in relation to locomotives worthy of close study. On page 68 he gives the half-year mileage of twenty railways in England to July 31st, 1876, the average being 881,207 for the year. This gives 17,625. Facing page 35 he gives a table of mileage of 176 engines on the Great Southern and Western Railway of Ireland, which shows an average mileage for ten years of only 13,926. On page 41 he makes out that these 176 engines would last 11·95 years, running 20,000 miles a year. On page 49 he says the average age of the Great Western engines was 6·1 years. On page 74 the President, in his closing remarks, says, "Many engines had been killed earlier than they ought to have been, because the traffic had increased faster than the engines to keep pace with it." He also says on page 75, referring to the North-Eastern, "That company had scarcely a spare engine. The engines were at work day and night." Now, if this was the case, that the engines were at work day and night, I cannot understand how they came to have such low average mileages in a year as 17,000 to 18,000, particularly as the loads are light, the roads good, and the speed high.

The report of the Pennsylvania Railway for 1874 shows the average of all their 786 engines, passengers and freight, to be for the year 25,263. One of these engines, No. 133, on Middle Division, is put down in this report as having run in the year 83,820 miles, on passenger trains. They give the largest run of any engine on each division. Thinking this might be an error, I wrote to Mr. Ely, the Superintendent of Motive Power, to ask if he would confirm this tremendous run. He wrote me that this engine not only ran the 83,820 miles as reported on passenger trains in 1873, but ran 2,904 on freight trains. This makes 237½ miles a day for every day in the year, and is much the largest run I ever heard of. You may depend on it that engines that can perform such duty are not toys or flimsy things. Taking 17,500 miles as the general average of engines in England, this mileage shows that this engine, No. 133, did 5½ years in one.

This same report shows that a freight engine, No. 215, on the same division, ran 48,012 miles in the year. The Pennsylvania Railway does not give me the age of the engines or data to get it; but the Reading Railway does. They give No., class, weight, maker's name, date when first run, miles run in the last year, total miles run, and service employed on. I will give you a few figures from the company's report of 1875, giving data up to the end of their official year, 30th November, 1874, when they had 403 engines :—

No.	Class.	Weight in Tons of 2,240 lb.	When first run.	Miles run in Year 1874.	Total to Date.
23	1st	26·9	July, 1852	24,780	410,733
44	1st	26·2	May, 1857	25,484	438,541
45	1st	23·8	June, 1857	27,428	422,222
49	1st	25·2	Aug., 1857	28,593	475,733
57	1st	25·2	June, 1859	35,407	426,071
58	1st	25·2	June, 1859	35,142	455,428

The above-named engines were all built by the Reading Railway Company, at their own shops;