they were all passenger engines; they had been running from fifteen to twenty years, and you will see that each of them did a large service in 1874. Taking 17,500 miles as a fair yearly average, these engines had been doing the equivalent of twenty-three to twenty-six years. I do not give the above figures as averages in any way. I selected them as giving large runs for the last year, and large totals. Some of their engines have five pair of drivers coupled that can run without complaint around curves of 600 feet radius: we have five of such engines on the railways of the Consolidation Coal Company of Maryland, where I have a large interest, and was for years a director. They do us good service, haul immense loads cheaply, and are easy on the track. I sent a photograph of this class of engines to the Institution of Civil Engineers. When Mr. H. Coneybeare, a member, was here, he told me the gentlemen of the Institution in Great George Street thought these engines were a "myth." I took him over to the Reading Railway, and showed him they were not a "myth." I placed him by the side of a curve—the sharpest there—600 feet radius, and told him to note that these engines run the curve without a squeak or groan.

You are right about the engines looking light, but they are not so in reality. They can and do do their work, and live to an old age. Don't fear their living only six to seven years. Much of the life of an engine depends on various circumstances, such as having a good driver, good water, fuel without much sulphur in it, a good track to run on, mild climate, repairs when required, not overloaded and the fires not urged to their utmost, moderate speed, &c., &c. All these things tell on an engine.

No. 2.

The Engineer in Charge, North Island, to the Hon. the Minister for Public Works.

Public Works Office, Wellington, 18th January, 1879.

Re comparative merits of American and English locomotives, as set forth in Mr. Brereton's letter, and forwarded by Agent-General.

This communication has been carefully read and considered, and I herewith forward a memorandum, prepared by Mr. Maxwell, which will be found to place the matter in a light very different from that imparted by Mr. Brereton's letter.

Further information on the whole subject will be obtained hereafter and laid before you, but I think sufficient grounds will be found in the accompanying memorandum to warrant the continuance of orders for locomotive engines being sent to England: not necessarily to the exclusion of orders for American engines, which, doubtless, will be found to answer well on certain lines and under certain conditions. In reference to the length of time which elapses after giving an order for engines in England before the receipt of the engines here, I may venture to offer an opinion, and to express it strongly, that sufficiently prompt action is not taken by the Home Consulting Engineer on receipt of an order, but that much time is needlessly lost. There is no possible reason why large English firms, with all necessary appliances, with which most of them are equipped, should not turn out locomotive engines as speedily as the American makers.

The Hon. the Minister for Public Works. John Blackett.

Enclosure in No. 2.

The District Engineer (Unattached) to the Engineer in Charge, North Island.

Public Works Office, Wellington, 16th January, 1879.

Mr. Evans's and Mr. Brereton's letters contain but little information which conveys any practical intelligence to a professional man which would permit him to give a verdict on the respective merits of the engines. They contain some vague generalizations which are calculated to mislead an unprofessional man. The subject is taken up as though it were new and previously undiscussed: it has, however, formed a subject of minute examination by some of the best engineers in both countries for years past.

The data necessary to enable a professional man to judge and to compare would comprise—the gross weight of the locomotive in working order, the adhesion weight of same, diameter of cylinders, stroke of piston, diameter of driving-wheels, wheelbase and particulars, tank capacity, coal capacity, particulars of boilers, heating surface, &c., working pressure, the cost of engines, the cost of running them, the engine mileage, the data showing how the engine mileage is computed, the character of the gradients, curves, and gauge on which the various classes were required to work. Then any particulars as to the average performances would be of some service; but without such data no locomotive engineer would pretend to offer an opinion.

Amongst some of the general and vague statements in Mr. Brereton's letter to which exception may be taken are as follow: Speaking of America, he says they have "steeper gradients, sharper curves, more severe climate, heavier loads hauled, and less speed in running." He classes these as drawbacks in obtaining a large train-mileage; but that low speed is a drawback is a very questionable assertion.

As regards gradients and curves, English lines show every gradation from the Festiniog (1 ft. 11½ in. gauge), which has curves 1¾ chains radius, and the Monmouth and Blaenavon line, with 1 in 42 gradients and 6-chain curves, up to the first-class lines with no curves sharper than 30 chains, and seldom under 60 to 80, and gradients not steeper than 1 in 100.

Mr. Zerah Colburn, an American engineer of considerable eminence, and a most able writer on this subject, in a paper on American locomotives read before the Institution of Civil Engineers, London,