

SECT. II.—OTHER SELECTED PAPERS.

(Paper No. 3467.)

“Early Railway Construction in New South Wales.”

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RAILWAY construction in Australia was commenced late in 1850, by the Sydney Railway Company, of which Mr. Charles Cowper was the first Chairman and Mr. F. W. W. Sheilds, M. Inst. C.E., the first Engineer.

At that time all the goods- and passenger-traffic of the interior passed over the highway between Sydney and Paramatta, a distance of about 14 miles, passengers and mails being carried by stage-coaches, and goods by bullock-teams, and it was thought that there were fair prospects of a railway between the two places paying good dividends on the capital required for its construction. The scale of wages was low, labourers being paid about 2s. 6d. per day of 10 hours, and tradesmen, including mechanics, about 5s. per day. There was therefore good reason for assuming that the line could be completed at a moderate cost.

The preliminary and working surveys were completed in the latter part of 1850, and one small contract for earthwork and bridge-construction was let to a local builder early in 1851, and was carried on at a very slow rate. There were no railwaymen in the country at the time and no railway plant of any description. Mr. Sheilds had only a small staff of assistants, comprising one mechanical engineer, one railway surveyor, and the Author, who had recently arrived from home. In February, 1851, Mr. Sheilds resigned his position as Engineer to the Company, and Mr. H. C. Mais, M. Inst. C.E., was appointed in his place. In November of the same year the Author commenced work on a special survey for railway extension towards Goulburn; this survey was finished as far as Mittagong, over rough country, in February, 1852. An alternative loop-line was then marked over the Razorback range, through the town of Camden, and in April the survey was finished and camp was broken up. The length marked out was 58 miles. The contingent office-work was completed and the plans and report

were submitted to the directors and adopted by them in June. The Author was then appointed Acting Engineer in charge of the works of construction in progress. About this time Mr. James Wallace was appointed Chief Engineer to the Sydney Railway Company, arriving in Sydney in July. After inspecting the works he recommended the directors to stop them at once, and to begin afresh at the Sydney end of the line, under new management; this recommendation was acted upon by the Board. On 17 July Mr. Cowper retired from the Managing Directorship of the Company and succeeded Mr. Charles Kemp as President, Mr. Wallace being appointed to a seat at the Board of Directors, to advise but not to vote. On 29 July the contractor for the works in progress was asked to give up his contract, a fair value being allowed for the work done, and Mr. William Randle was appointed Manager of Works, it being intended to carry out the work on the small sub-contract system, the Company to supply necessary plant. On 7 August an agreement was made between Mr. Randle and the Company, under which the former undertook to carry out certain earthworks at the Sydney end, at agreed prices, including all plant and tools. There were as yet no earth-wagons, nor any rails; in fact, the first rails subsequently used were of hardwood, plated with flat bar-iron. On 10 August the first party of excavators under the new management was set to work at Redfern, at day wages. On 31 August the Government decided to bring out five hundred trained railway workmen from England, the available local labour being scarce and inferior. At the same time the Government agreed to advance funds to enable the Company to proceed vigorously with the works. At this time the Hobson's Bay Railway Company was formed in Melbourne.

On 14 October Mr. E. Deas Thompson, the Colonial Secretary, made a personal inspection of the works, and on 15 November a loan of £100,000 from the Savings Bank to the Company was authorized by the Government. On revision of the plans it was found that barely sufficient land had been purchased for a single line of railway, and as a double line had been decided on it became necessary to secure additional width throughout the entire length of the line. On 23 November a letter was received by the Directors from the Government offering to provide funds at the rate of £3 for every £2 of capital raised on shares, on condition, however, that the Government should appoint two directors, one of whom was to be President of the Board. On the same date there was an official demand on the part of the contractor for an increase in price from 1*s.* 6*d.* to 2*s.* 2*d.* per cubic yard for earthwork, on

account of increasing labour difficulties. On 2 April, 1853, the labourers working as excavators struck work for an increase of wages to 10s. per day. Very little progress was made with the works during April and May. Early in June the Hunter River Railway Company was formed to open up the Hunter River district, Mr. Charles Cowper being one of the directors. The line projected was to connect Newcastle and Maitland. On 3 October Mr. Wallace, the Chief Engineer of the Sydney Railway Company, was appointed Consulting Engineer to the Hunter River Railway Company. On 25 August two hundred railwaymen arrived in Sydney from England, engaged and shipped for the Government. Seventy ordnance tents were supplied for their accommodation, and they were placed temporarily in the charge of the Manager of Works. A second consignment of railway men arrived on 11 November and a third and final consignment on 10 December. Many of the newly-arrived labourers were Welshmen, and objected to working under other than Welsh gangers, and as many of them could not speak English there was a good deal of trouble in setting them to work. On 26 August the Government notified the Company of the appointment of Mr. Merewether as President of the Railway Board, and at the first meeting held under this new arrangement, on 29 August, Mr. Cowper resigned his position as a director.

Alteration of the Proposed Gauge of Railways from 5 Feet 3 Inches to the Standard English Gauge of 4 Feet 8½ Inches.—Mr. Wallace, on taking charge as Chief Engineer, strongly urged the Sydney Railway Board to adopt the standard English gauge of 4 feet 8½ inches instead of the 5-foot 3-inch gauge decided on prior to his arrival. Mr. Wallace's reason for advising the alteration was that for the standard gauge there would be no difficulty in obtaining an ample supply of rolling-stock at short notice; whereas for the 5-foot 3-inch gauge there was a very limited supply, there being only a small number of manufacturers of rolling-stock of this gauge. At that time (July, 1852) not a yard of permanent-way had been laid in any of the Australian Colonies, nor had any rails been imported. The directors approved of the recommendation, which was adopted by the Government, and the 4-foot 8½-inch gauge thus became the standard for New South Wales railways. An official communication was at once forwarded to the Government of Victoria giving particulars of the change decided upon, and asking that Government also to adopt the alteration; but, although railway construction had not been begun in Victoria, the authorities decided to adhere to the 5-foot 3-inch

gauge; hence arose the break of gauge between New South Wales and Victoria.

On 22 March, 1854, the first consignment of permanent rails arrived in Sydney. On 12 May the directors called for independent test tenders for fencing, and on 29 May the lowest rate tendered was 18s. per rod (16½ feet), being 3s. per rod higher than Mr. Randle's scheduled rate. There was no contract under seal for the Sydney-Paramatta line, the rates of payment for the various works being agreed upon from time to time, as the state of the labour market rendered revision of prices necessary. Mr. Randle was, in fact, the acting contractor for the line. There was no possibility of competition, as the only railwaymen in the country were those imported by the Government, supplemented from time to time by a few skilled artisans or labourers, attracted by the gold-diggings and the chance of employment on the only railway-works then in progress.

Cost of Labour and Materials.—During the years 1851-1857, many changes took place in the cost of labour and materials, and the following are some particulars relating thereto; the working-time for all classes of labour was fixed at 60 hours per week.

Rates of wages in the United States, 1851 :—

	Per Day of 10 Hours.
Labourers on public works	3s. to 4s. 6d.
Carpenters, bricklayers and masons	6s. 3d. to 9s. 4d.

Rates of wages in England, 1851 :—

Excavators	3s. to 3s. 6d.
Masons, bricklayers and carpenters	5s. to 5s. 6d.
Smiths	4s. 6d. to 5s.
Horse, cart and driver	7s.

Rates of wages in Sydney :—

	Sept. 1852. Per Day.	Sept. 1854. Per Day.
Labourers	5s. to 6s.	15s.
Masons and bricklayers	8s. to 8s. 6d.	26s. to 27s.
Carpenters	7s. to 9s.	18s.
Smiths	9s. to 10s.	15s. 6d.

Rates of wages in Sydney :—

	April, 1855. Per Day.	August, 1855. Per Day.
Masons	16s. to 21s.	16s. 8d.
Bricklayers	20s.	18s.
Carpenters	10s. to 11s.	10s.

On 10 August, 1854, an estimate of the cost of the Hunter River line was submitted by the Consulting Engineer, Mr. Wallace. The total cost was estimated at £310,000 for a double line 18¼ miles in length. The consideration of the estimate was postponed, and, meantime, the Resident Engineer was sent to

Newcastle to erect huts for the expected railwaymen. On 5 October tenders were received by the Hunter River Railway Company for the construction of the first section of the line between Newcastle and Hexham; the lowest was that of Mr. William Wright, which was accepted. On 16 November the Chief Engineer's estimates for the construction of the line were adopted. A Government Railways Bill was passed on 2 December. On 20 February, 1855, the two first locomotive-engines were received from the shops of Messrs. Stephenson and Sons, of Newcastle-upon-Tyne, and on 29 March No. 1 engine made its trial trip.

On the Sydney-Paramatta Railway approaching completion it was agreed that Mr. Randle should undertake the working of the traffic, receiving 55 per cent. of the gross revenue on condition that he maintained the works and rolling-stock in good order, wear and tear being allowed. On 18 August, 1855, the railway was officially opened. The first train consisted of No. 1 engine, three first-class carriages and a van. Several special trains were run during the month of August, but the line was not opened for public traffic, pending completion of the sidings and stations, until 26 September. Up to 1 September, 1856, the line was worked by four engines, Nos. 1 and 2 from Messrs. Stephenson's, and Nos. 3 and 4 from Messrs. Hawthorn's works, Newcastle-upon-Tyne. The following are particulars of No. 1 engine:—Inside cylinders, 16 inches in diameter by 24 inches stroke; six wheels; leading and driving wheels, coupled, 5 feet 6 inches in diameter; trailing wheels, 3 feet 9 inches in diameter; working boiler-pressure, 110 to 120 lbs. per square inch: six-wheel tender; wheels, 3 feet 9 inches in diameter; tank-capacity, 2,000 gallons: weight of engine, empty, 20 tons; with fuel and 500 gallons of water, 22·85 tons: weight of tender, empty, 9½ tons; with fuel and water, 20·55 tons: gross weight of engine and tender, 43·40 tons; hauling-capacity on the level, 372 tons; on a 1-in-66 gradient, 85 tons; cost, shipped, £2,725; freight and charges, £600; landing and erecting, £350; total cost, £3,675.

On 19 September, 1856, it was reported to the Commissioners that Mr. John Whitton had been appointed to succeed Mr. James Wallace as Chief Engineer. Mr. Whitton reached Sydney on 14 December, and was followed by three assistants a month later.

The foregoing notes are intended to provide some record of the progress of railway-construction in New South Wales up to the end of 1857.