

1899.
VICTORIA.

REPORT

FROM

THE PARLIAMENTARY STANDING COMMITTEE
ON RAILWAYS

ON THE QUESTION OF

INCREASING THE LIMIT OF EXPENDITURE

FOR THE

COLAC AND BEECH FOREST RAILWAY;

TOGETHER WITH THE

APPENDICES AND MINUTES OF EVIDENCE.

Ordered by the Legislative Assembly to be printed, 2nd November, 1899.

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EXTRACTED FROM THE VOTES AND PROCEEDINGS OF THE
LEGISLATIVE ASSEMBLY.

THURSDAY, 14TH SEPTEMBER, 1899

* * * * *
2. COLAC AND BEECH FOREST RAILWAY.—The Order of the Day for the resumption of the debate on the question—That the question of increasing the limit of expenditure fixed by section 5 of Act No. 1594 for the construction of the Colac to Beech Forest Railway be referred to the Parliamentary Standing Committee on Railways for consideration and report, *and on the following amendment*:—That the following words be inserted after the word “Railway”:
“and also the question of affording railway facilities to the Beech Forest by means of an extension of the Forrest line”—having been read—

Debate resumed.

Question—That the words proposed to be inserted be so inserted—put and negatived.

And, after further debate—

Question—That the question of increasing the limit of expenditure fixed by section 5 of Act No. 1594 for the construction of the Colac to Beech Forest Railway be referred to the Parliamentary Standing Committee on Railways for consideration and report—put and resolved in the affirmative.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON RAILWAYS.

(Fourth Committee.)

E. H. CAMERON, Esq., M.L.A., Chairman ;

The Hon. J. H. Abbott, M.L.C.,
A. W. Craven, Esq., M.L.A.,
A. Harris, Esq., M.L.A.,
The Hon. D. Melville, M.L.C.
(Vice-Chairman),

The Hon. E. Morey, M.L.C.,
J. Styles, Esq., M.L.A.,
W. A. Trenwith, Esq., M.L.A.,
J. S. White, Esq., M.L.A.

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COLAC AND BEECH FOREST RAILWAY.

LIMIT OF EXPENDITURE.

REPORT.

THE PARLIAMENTARY STANDING COMMITTEE ON RAILWAYS, to which the Legislative Assembly referred the question of increasing the limit of expenditure fixed by section 5 of Act No. 1594 for the construction of the Colac to Beech Forest Railway, has the honour to report as follows:—

1. The Colac to Beech Forest railway was recommended by the Committee as one of the experimental narrow-gauge lines, the construction of which has been decided on by Parliament, with the object of testing the capabilities of such lines for opening up sparsely-settled districts in Victoria. The narrow-gauge experiment.

In October, 1894, when the question of narrow-gauge railways was remitted to the Committee for inquiry, it will be remembered that railway construction in the colony had practically come to a standstill, owing, in a large degree, to the excessive cost of building and working broad-gauge branch railways, except in comparatively level country like the Mallee.

After obtaining information from Europe, India, and other countries where narrow-gauge lines have been built during recent years, the Committee, notwithstanding the fact that the engineers and other officers of the Railway Department were strongly opposed to any departure from the standard gauge, reported that the evidence obtained indicated that the desired object of affording to sparsely-settled country districts an adequate means of transport to the main lines might be attained by means of narrow-gauge railways or tramways, "properly constructed, adequately equipped for the traffic to be accommodated, and properly managed." The Committee further recommended the construction of one or two trial lines in suitable districts as an experiment. See Report on Narrow-gauge Railways No. 2, 1895.

2. The selection of localities for the permanent survey of these trial lines was remitted to the Committee in February, 1896, and on the 18th August, 1896, the Committee reported on the various localities visited, and selected four as the districts presenting the strongest claims to narrow-gauge railways, and the most suitable for the trial lines. Selection of localities for trial lines. See Report No. 2, 1896.

The Committee also recommended that, in view of the importance to the country districts of the trial about to be made and the strongly adverse views of the Railway officers, that a competent narrow-gauge engineer should be specially appointed by the Government to superintend the carrying out of the experiment.

The Beech Forest was one of the four districts thus selected, and the permanent survey of a line from Colac to Gardiners was undertaken under the direction of the Engineer-in-Chief.

Colac to Beech
Forest railway.

3. On the 16th November, 1898, when the survey was nearing completion, the construction of a 2ft. 6in. gauge railway from Colac to Beech Forest was referred to the Committee for inquiry and report.

The line was 30·03 miles in length, with a ruling gradient of 1 in 30, and curves of 2 chains radius. The cost was estimated by the Engineer-in-Chief at £86,365, or £2,898 per mile, exclusive of land and rolling-stock. The working expenses were estimated by the Commissioner at £3,065 per annum; the annual interest charge (including interest on £9,365, the estimated cost of rolling-stock) amounted to £3,350; the cost of transferring through traffic at the Colac junction was put down at £285; making a total annual cost of £6,700. The estimated revenue, based on local rates, was stated at £3,684 per annum. The line as proposed by the Department thus showed an estimated deficit of £3,016 per annum.

Committee's
previous re-
commendation.
See Report No.
10, 1898.

4. After very careful inquiries had been made, the Committee reported that it was of opinion "that a narrow-gauge line can be built to deal with the traffic, and any probable increase therein for a number of years, for a sum of £60,000," and it recommended that the proposed line be authorized as the last of the trial narrow-gauge lines, "provided the cost of construction shall not exceed £60,000, and provided further that special rates be charged on the railway."

On this basis the Committee showed that the deficit estimated by the Department would probably be reduced very materially, and that the estimated shortage would be about £371 per annum.

Limit of
expenditure
fixed by Act
No. 1594.

5. An Act (No. 1594) authorizing the construction of the railway was passed last session, when it was enacted as recommended by the Committee that "the expenditure for the construction of the said line of railway shall not exceed Sixty thousand pounds."

Decision of
Committee.

6. The question of increasing this limit of expenditure was referred to the Committee on the 14th September last. Having reconsidered the matter, and having carefully examined the revised estimates submitted by the Engineer-in-Chief and the contractors' schedules of prices, the Committee is of opinion that the sum of £60,000 is sufficient for the purpose of constructing an efficient narrow-gauge railway from Colac to Beech Forest as one of the experimental trial lines recommended by the Committee in its Report of the 18th August, 1896, if, as repeatedly recommended by the Committee, and promised by the Government, the undertaking is placed in the hands of an engineer who is in sympathy with the principle of narrow-gauge railways, and who has had experience in their construction. The Committee is also of opinion, as indicated in previous Reports, that the prospective traffic is not sufficient to warrant a larger expenditure than £60,000 on the construction of this line.

The revised estimates submitted by the Engineer-in-Chief and reports by the Commissioner and officers of the Railway Department are appended.

Divisions, sec. 5,
sub-sec. (6),
Act No. 1177.

7. The following extracts from the Minutes of the Proceedings of the Committee show the divisions that took place during the consideration of this question :—

TUESDAY, 31st OCTOBER, 1899.

Mr. Melville moved, That the Committee, having reconsidered the limit of expenditure fixed for the construction of the Colac to Beech Forest railway, and having carefully examined the revised estimates submitted by the Engineer-in-Chief and the contractors' schedules of prices, is of opinion that the sum of £60,000 is sufficient for the purpose of constructing an efficient narrow-gauge railway as one of the experimental trial lines recommended by the Committee in its Report of the 18th of August, 1896.

Debate ensued.

Question—put.

The Committee divided.

Ayes, 8.
The Chairman,
Mr. Abbott,
Mr. Craven,
Mr. A. Harris,
Mr. Melville,
Mr. Morey,
Mr. Trenwith,
Mr. White.

Noes, 1.
Mr. Styles.

And so it was resolved in the affirmative.

THURSDAY, 2ND NOVEMBER, 1899.

The Committee proceeded to consider the Draft Report on the question of the limit of expenditure fixed for the Colac to Beech Forest narrow-gauge line.

The Draft Report was read.

Paragraphs 1 to 5 inclusive again read and agreed to.

Paragraph 6 again read.

The Chairman moved, That the following words be inserted in line 7, after "August, 1896," viz. :—"if, as repeatedly recommended by the Committee, the undertaking is placed in the hands of an engineer who is in sympathy with the principle of narrow-gauge railways, and who has had experience in their construction."

Debate ensued.

Mr. Trenwith moved, as an amendment, That the words "and promised by the Government" be inserted after "Committee."

Question—That the words proposed to be inserted be so inserted—put and resolved in the affirmative.

Question—That the following words be inserted in line 7 of paragraph 6, after "August, 1896," viz. :—"if, as repeatedly recommended by the Committee, and promised by the Government, the undertaking is placed in the hands of an engineer who is in sympathy with the principle of narrow-gauge railways, and who has had experience in their construction"—put.

The Committee divided.

Ayes, 5.	Noes, 2.
The Chairman,	Mr. Melville,
Mr. Abbott,	Mr. Styles.
Mr. Craven,	
Mr. Trenwith,	
Mr. White.	

And so it was resolved in the affirmative.

Paragraph 6, as amended, agreed to.

Paragraph 7 agreed to.

Mr. Trenwith moved, That the Report, as amended, be adopted.

Question—put.

The Committee divided.

Ayes, 6.	Noes, 1.
The Chairman,	Mr. Styles.
Mr. Abbott,	
Mr. Craven,	
Mr. Melville,	
Mr. Trenwith,	
Mr. White.	

And so it was resolved in the affirmative.

Ordered—That the Report be signed by the Chairman and presented to the Legislative Assembly this day.

E. H. CAMERON,
Chairman.

Railways Standing Committee Room,
Parliament House, Melbourne, 2nd November, 1899.

APPENDICES.

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- B.—Reduced estimate by the Engineer-in-Chief, showing works to be provided by him for £60,000.
- C.—Certificate by the Engineer-in-Chief of the estimated cost of the line (£83,870).
- D.—Comparison of Engineer-in-Chief's revised estimate (£83,870) with his original estimate (£86,365).
- E.—Memorandum by the Railways Commissioner with reference to limiting the cost of construction to works included in Engineer-in-Chief's estimate of £60,000.
- F.—Memorandum by the Superintending Inspectors (Messrs. J. McNamara, W. Clark, and N. McInnes).
- G.—Memorandum by the Engineer for Existing Lines with reference to the reduced estimate of the Engineer-in-Chief.
- H.—Memorandum from the Secretary for Railways, and letter in reply thereto by the Chief Mechanical Engineer.

APPENDICES.

APPENDIX A.

LETTER FROM THE ENGINEER-IN-CHIEF FORWARDING (1) STATEMENT SHOWING ALTERATIONS NECESSARY TO REDUCE THE COST OF THE LINE TO £60,000; (2) CERTIFICATE OF ESTIMATED COST MADE PRIOR TO CALLING FOR TENDERS FOR THE CONSTRUCTION OF THE LINE; (3) COMPARISON OF REVISED ESTIMATE WITH ORIGINAL ESTIMATE.

Board of Land and Works
(Railways Construction Branch),
Engineer-in-Chief's Office,
Melbourne, 27th September, 1899.

E.C. 99/2840.

COLAC AND BEECH FOREST RAILWAY.

Sir,

Referring to your letter of the 23rd instant, respecting the question of increasing the limit of expenditure on the above-mentioned railway, I have the honour to forward herewith—

1. Statement showing alterations in works necessary, in my opinion, to reduce the cost to £60,000, the estimate of the Railways Standing Committee.
2. Certificate of estimated cost (supplied under Act 1250, Part I, section 9), viz., £83,870, made prior to calling for tenders for the construction of the line.
3. Comparison of revised estimate made from permanent survey, with original estimate submitted to the Committee, dated 14th November, 1898.

These show the position, and also all information asked for by your Committee.

I have the honour to be, Sir,
Your obedient servant,

F. RENNICK,
Engineer-in-Chief.

Thos. G. Watson, Esq.,
Clerk of Committees,
Parliament House,
Melbourne.

Board of Land and Works,
(Railway Construction Branch),
Engineer-in-Chief's Office,
Melbourne, 21st January, 1899.

PROPOSED COLAC TO BEECH FOREST RAILWAY.

2ft. 6in. Gauge.

Memorandum.

The attached statement shows the alterations in works necessary, in my opinion, to bring the cost of the line down from my estimate to the estimate of the Railways Standing Committee inserted in the Act.

The portion of the provision of 10 per cent. not required for contingencies (if any) might be expended on further clearing and hard ballasting.

The line on the reduced basis would be a very inferior one to that designed by me, and cost considerably more to work, and the safe speed, with no fencing, no hard ballast, and only part clearing, would be very low.

(Signed) F. RENNICK,
Engineer-in-Chief.

The Hon. the Minister of Railways.

APPENDIX B.

REDUCED ESTIMATE BY THE ENGINEER-IN-CHIEF (£60,000).

COLAC TO BEECH FOREST LINE.

2ft. 6in. Gauge.

	Estimate 14/11/98, £86,365.* (See notes below.)	Reduced Estimate, £60,000.† (See notes below.)	Remarks.
	£	£	
Land transfer expenses ...	500	500	
Clearing and grubbing ...	6,456	3,003	Work reduced to a minimum, taking risk of accident from falling timber
Fencing, cattle pits, and gates	1,744	...	Fencing omitted as provided in Act (leaving land-owners to erect fences or cattle pits)
Excavation in cuttings, side and back cuttings	16,850	11,618	Quantities and average lead reduced by steeper ruling grade, 1 in 25.
Excavation in ditches, drains, and foundations	1,680	1,680	
Provision for land slips ...	1,400	1,200	Depth of risky cuttings reduced by steeper grade
Excavation in approaches	200	164	Quantity reduced by steeper ruling grade
Dry rubble walls ...	625	625	
Excavation in station grounds	969	807	Approaches reduced in size
Bridges ...	3,694	3,694	
Pitching outlets ...	160	160	
Timber, concrete, or brick culverts	4,634	3,690	Timber substituted for brick or concrete in all but very high embankments, rendering renewals of timber culverts necessary
Metalling roads ...	1,283	55	Road approaches left like shire roads, no metalling
Ballast ...	5,940	1,013	Best material, loam, sand, &c., available at short lead substituted for stone and gravel. Hard ballasting postponed
Sleepers ...	4,545	4,545	Price cannot be reduced under present forest regulations <i>re</i> sleeper cutting
Permanent-way materials	10,667	10,667	Price fixed by Commissioner
Laying permanent way ...	2,840	2,840	
Terminal station ...	900	500	Part accommodation postponed
Roadside stations ...	450	450	
Junction station requirements	3,000	2,600	Part accommodation postponed
Turntable, engine-sheds, and tools	800	300	Part accommodation postponed
Water supply ...	1,000	550	Part accommodation postponed
Trucking yards ...	100	100	
Cranes ...	300	300	
Telegraph ...	600	450	Inferior poles and trees used
Provision ...	7,134	5,151	10 per cent. in each case
Engineering, &c. ...	7,894	3,338	Cost of survey to be charged to item "General Survey" and not to the line
Total ...	86,365	60,000	

Design altered to suit reduced money by steepening ruling grade (to 1 in 25), postponing half the clearing, all the fencing, and stone and gravel ballasting; substituting timber for concrete culverts; postponing accommodation at stations; charging surveys to general items, &c., &c.

The line, as made for the reduced money, would be in construction and equipment very much of the same character as the N. E. Dundas tramway in Tasmania.

The line can be regraded to original grade later on when the traffic develops.

* The estimate of 14.11.98—£86,365—is the Engineer-in-Chief's estimate for a substantial line, with ruling grade of 1 in 40 from Colac to Gellibrand, and 1 in 30 Gellibrand to Gardiners.

† The reduced estimate of £60,000 is the amount to which the Engineer-in-Chief's estimate was cut down by the Railways Standing Committee, and is the amount provided in the Act.

(Signed)

F. R.,
Engineer-in-Chief.
21.1.99.

APPENDIX C.

CERTIFICATE BY THE ENGINEER-IN-CHIEF OF THE ESTIMATED COST OF THE
LINE (£83,870).

Board of Land and Works
(Railways Construction Branch),
Engineer-in-Chief's Office,
Melbourne, 29th May, 1899.

COLAC TO BEECH FOREST RAILWAY.

In accordance with the provisions of Act 1250, Part I., section 9, I hereby certify that my estimate—

- (a) Of the cost of the above railway, constructed on a gauge of two feet six inches (2' 6"), with second-hand 60-lb. iron rails, including "roads, bridges, culverts, and works, also engineering supervision and a full equipment necessary for the opening and working of the railway for public traffic, exclusive of land, engines, and rolling-stock," is £80,870 ; and
- (b) My estimate of "the cost of all additional works, stations, and sidings which may be required within a period of three years after the railway has been opened for public traffic" is £3,000.

(Signed) F. RENNICK,
Engineer-in-Chief.

The Hon. the Minister of Railways.

NOTE.—The Commissioner's estimate for rolling-stock, as shown in Railways Standing Committee's Report of 1st December, 1898, pp. 4 and 9, is £9,365.

APPENDIX D.

COMPARISON OF ENGINEER-IN-CHIEF'S REVISED ESTIMATE WITH ORIGINAL ESTIMATE SUBMITTED TO THE COMMITTEE.
 COLAC TO BEECH FOREST.—(2ft. 6in. Gauge Railway.) Length, 29 miles 63 chains. Ruling grade, 1 in 30. Sharpest curve, 2 chains radius.
Comparison of Revised Estimate made from Permanent Survey with Original Estimate submitted to Committee.

Description of Works.	Original Estimate, 14th November, 1898.		Estimate based on Contract Schedule, No. 8211.		Increase.	Decrease.	Remarks.
	Quantity.	Rate.	Amount.	Quantity.				Rate.	Amount.
Land transfer expenses	...	£ s. d.	£ s. d.	Quantity.	£ s. d.	£ s. d.	
Clearing and grubbing	30.03 m.	215 0 0	6,456 9 0	29.6 m.	sum of	500 0 0	
Cattle pits	59 No.	6 10 0	383 10 0	52 No.	sum of	6,456 6 4	
Occupation and station gates	...	sum of	160 0 0	...	sum of	287 19 0	
Fencing	30 m.	40 0 0	1,200 0 0	59.2 m.	sum of	159 10 0	Less crossings required.
Excavation in cuttings (10 feet formation)	179,060 c. y.	0 1 4	11,933 6 8	190,000 c. y.	0 1 4	12,666 13 4	Full fencing now provided for.
Excavation in side or back cuttings	118,000 c. y.	0 0 10	4,916 13 4	114,000 c. y.	10d. & 11d.	4,818 15 0	Station ground cuttings added and slips below.
Excavation in side ditches and creek diversions	28,000 c. y.	0 0 9½	1,108 6 8	30,400 c. y.	9d. & 10d.	1,147 1 8	Benching, &c., to add, see below.
Excavation in drains	2,610 l. c.	0 3 0	391 10 0	2,700 l. c.	0 3 0	405 0 0	
Benching, soiling, rolling, &c.	...	...	...	...	sum of	119 1 8	See side cutting.
Excavation in foundations to culverts, &c.	2,400 c. y.	0 1 6	180 0 0	4,000 c. y.	1s. 6d. & 2s.	302 10 0	
Provision for landships	...	sum of	1,400 0 0	21,000 c. y.	0 1 4	1,400 0 0	Added to cuttings, making total 21,000 c. y.
Excavation in approaches, roads, &c.	3,200 c. y.	0 1 3	200 0 0	1,900 c. y.	0 1 5	134 11 8	
Dry rubble walls (building only)	2,500 c. y.	0 5 0	625 0 0	1,800 c. y.	0 5 0	450 0 0	
Excavation in station grounds, including platforms	15,000 c. y.	0 1 3½	986 15 0	4,200 c. y.	0 1 4	280 0 0	
Timber bridges, trestles and sheeting (local timber)	1,679 l. f.	2 4 0	3,693 16 0	1,300 l. f.	1 12 10	2,137 17 6	
Pitching inlets and outlets to culverts	800 s. y.	0 4 0	160 0 0	...	sum of	111 10 0	
Timber culverts, including ironwork (local timber)	14,300 c. f.	0 2 0	1,430 0 0	15,130 c. f.	0 1 11½	1,495 17 1	Less number required.
Brick and cement concrete culverts	1,068 c. y.	3 0 0	3,204 0 0	951 c. y.	3 0 0	2,853 0 0	Number increased.
Metalling and graveling roads, &c.	5,600 c. y.	0 4 7	1,283 6 8	5,650 c. y.	0 4 6½	1,282 10 0	Less number required, more timber used.
Ballast	26,900 c. y.	0 4 5	5,940 8 4	32,886 c. y.	0 3 7¼	5,939 5 0	Quantity increased; rate decreased.
Sleepers 5' 6" x 8" x 4" (local timber)	60,600 No.	0 1 6	4,545 0 0	69,390 No.	0 1 6	5,212 10 0	Number increased.
Permanent-way materials, main line and sidings, second-hand 60-lb. iron rails	31.32 m.	323 0 0	10,116 7 2	31.32 m.	323 0 0	10,116 7 2	
Points and crossings	...	sum of	550 10 0	...	sum of	550 10 0	
Laying permanent way, main line and sidings	...	sum of	2,840 0 0	...	sum of	2,828 5 0	
Terminal station	...	sum of	900 0 0	...	sum of	800 0 0	
Roadside stations	6 No.	sum of	450 0 0	...	sum of	1,811 12 4	
Junction station requirements	...	sum of	3,000 0 0	...	sum of	3,000 0 0	
Turntables, engine-shed, tools, &c.	3 No.	sum of	800 0 0	...	sum of	800 0 0	
Water supply	2 No.	sum of	1,000 0 0	...	sum of	1,000 0 0	
Trucking yards	3 No.	sum of	100 0 0	...	sum of	100 0 0	
Cranes	30 m.	100 0 0	300 0 0	...	sum of	300 0 0	
Telegraph	...	20 0 0	600 0 0	...	sum of	600 0 0	Additional equipment provided for.
Provision	10 per cent.	...	71,336 18 10	5 per cent.	...	71,304 7 9	Provision reduced by 5 per cent.
Engineering, surveying, and general supervision	...	...	7,133 13 11	...	...	3,565 4 4	Increased amount required to cover survey charges.
			7,894 8 5			1,105 11 7	
Net decrease			86,365 1 2			83,869 12 1	
						2,495 9 1	

APPENDIX E.

MEMORANDUM BY THE RAILWAYS COMMISSIONER WITH REFERENCE TO
LIMITING THE COST OF CONSTRUCTION TO WORKS INCLUDED IN ENGINEER-
IN-CHIEF'S ESTIMATE FOR £60,000.

Victorian Railways,
Commissioner's Office, Spencer-street,
Melbourne, 25th February, 1899.

MEMORANDUM.—COLAC TO BEECH FOREST NARROW-GAUGE LINE.

Adverting to Act 1594, authorizing construction of this line, section 5, which limits the expenditure therefor to £60,000, and the Hon. the Minister's request to be furnished with the Commissioner's views on the memorandum of the Engineer-in-Chief showing the reductions he proposes in order to bring his original estimate of the cost within the limit fixed by Parliament, the Commissioner has the honour to say that he has had the question carefully gone into with a view to seeing how the alterations indicated by the Engineer-in-Chief would affect future working.

In regard to the following items, he regrets he must take exception to the proposed curtailment of cost for the reasons stated hereunder, viz.:—

(1) *Clearing and Grubbing.* Reduced from £6,456 to £3,003.—The saving on this item is proposed to be made by reducing the quantity of clearing, leaving the Commissioner to take the risk of accidents from falling timber. A similar course was adopted on the Gippsland coal lines; but when the conveyance of passengers over these was entered upon it speedily became necessary, in the interests of safety to human life, to remove all overhanging trees. As the menace to safety on this line would be equally great, the Commissioner is not prepared to accept the responsibility, and he would point out that the work of clearing can be done at less cost during the construction of the line than would be the case afterwards.

(2) *Fencing, Cattle-pits, and Gates.*—Original estimate £1,744. Item proposed to be omitted altogether, and work left to land-owners to do.

As the Construction Act, while relieving the Board from responsibility for providing fencing, &c., does not make it compulsory for land-owners to do the work, it is probable the line will remain unfenced for a considerable time.

It will thus be subject to a great deal of trespass by stock, the clearing along the line permitting a freer and sweeter growth of grass, which will attract animals in the neighbourhood, add to the liability to accidents, and through the resulting damage to the formation, ballast, &c., increase the cost of maintenance by at least 5 per cent., or a sum more than sufficient to pay interest on the proposed saving of capital expenditure.

(3) *Excavation in Cuttings, &c.*—Estimate reduced from £16,850 to £11,618.

Provision for Landslips.—Estimate reduced from £1,400 to £1,200.

Excavation in Approaches.—Estimate reduced from £200 to £164.

The anticipated saving on these items is due, it appears, to reductions in quantities and average lead, owing to adoption of a ruling grade of 1 in 25. This will not seriously affect the cost of maintenance; but the adoption of the steeper grade will diminish the load which can be hauled over the line, and add to the estimated cost of working a sum of about £50.

(4) *Metalling Roads.*—Estimate reduced from £1,283 to £55. Road approaches left like shire roads, no metalling.

In a wet climate such as this it will not be possible to get traffic to or from the stations in winter time unless a reasonable amount of metalling is done.

(5) *Ballast.*—Estimate reduced from £5,940 to £1,013 by substitution of loam, sand, &c., for stone and gravel; hard ballasting postponed.

One of the first essentials of a good road-bed is good ballast. The Commissioner is advised by the Engineer for Existing Lines that in wet weather, especially in a locality subject to such heavy rainfall, and on a 2ft. 6in. gauge line with grades of 1 in 25 and curves of 2 chains radius, it would be unsafe to run trains even at a low rate of speed without proper ballast, and even if the question of safety were not involved, such an inferior line would cost at least 20 per cent. more to maintain than would one properly constructed.

(6) *Engineering, &c.*—Reduced from £7,894 to £3,338. Cost of survey to be charged to item General Surveys, and not to the line.

This cannot be done. It would simply mean that other lines would have to bear part of the burden that rightly belongs to the proposed Beech Forest line. The interest on the money expended would still have to be paid, whether booked as a charge to General Surveys, or transferred in accordance with the regular practice, and as it justly should, to the line to which it applies.

The Commissioner is informed that a sum of £5,960 has already been expended on surveys in connexion with this line, and the only straightforward way is to debit it against the line, instead of holding it in suspense in the General Account.

In view of the facts set out in the foregoing, the Commissioner, in the interests of safety and public utility, has no alternative but to ask that the line be so constructed that when handed over it shall be possible to work it without undue risk of accident, and at a cost within the estimate of working expenses supplied to the Committee.

In the right-hand column of the statement hereunder are set out the additional amounts which he considers necessary for this purpose.

Item.	Engineer-in-Chief's Estimate.		Estimated Cost of Work required for Safety, &c.	Difference. Amount to be added to Engineer-in-Chief's Reduced Estimate.
	Original.	Reduced.		
Clearing and grubbing	£ 6,456	£ 3,003	£ 6,456	£ 3,453
Metalling roads	1,283	55	1,283	1,228
Fencing, cattle-pits, and gates	1,744	...	1,744	1,744
Ballast	5,940	1,013	5,940	4,927
Engineering, &c.	7,894	3,338	7,894	4,556
	...	...	...	£15,908
Total of Engineer-in-Chief's reduced estimate ... ..	...	...	...	£60,000
Add additional amount required as above ... ..	...	...	...	15,908
Total estimated necessary expenditure for construction of line ... ..	...	...	...	£75,908

JNO. MATHIESON, Commissioner.

The Honorable the Minister.

APPENDIX F.

MEMORANDUM BY THE SUPERINTENDING INSPECTORS (MESSRS. J. McNAMARA, W. CLARK, AND N. McINNES).

Railway Department,
Office of Engineer of Existing Lines,
Melbourne, 6th February, 1899.

MEMO. FOR THE ENGINEER FOR EXISTING LINES.—COLAC TO BEECH FOREST RAILWAY.

Re attached, we beg to report that the first consideration in the construction of a railway should be the stability of the road-bed which cannot be obtained without the use of good ballast. With the loam and sand proposed to be used it is questionable if the line might not become unfit for traffic in wet weather even at a low rate of speed, as the ballast would become mud and, consequently, unworkable for packing purposes. The lives of the sleepers would also be affected through the means of drainage being insufficient with this material.

Doing away with the metalling of the station yards will result in attention being required in this direction, as in order to gain ingress and egress teams have to turn and twist, in fact the yards would be practically impassable in winter, and we venture to assert that it would then be necessary to do at an increased cost what is now being omitted.

The absence of fencing would be a danger, and we quite agree with Mr. W. R. Rennick in this matter.

It is considered that unless all overhanging trees, or those which if blown down would fall across the line, are cut down accidents would sooner or later occur.

In conclusion, we beg to state that after giving the matter our careful consideration, we are of opinion that the cost of maintenance of a line of this description in a wet locality would be materially affected if constructed on the reduced estimate, and in addition to which a certain amount of risk would be involved in its working.

The increased cost of maintenance would be about 20 per cent.

J. McNAMARA, }
W. CLARK, } Superintending
N. McINNES, } Inspectors.

APPENDIX G.

MEMORANDUM BY THE ENGINEER FOR EXISTING LINES WITH REFERENCE TO THE REDUCED ESTIMATE OF £60,000.

Railway Department,
Office of Engineer of Existing Lines,
Melbourne, 17th February, 1899.

MEMO. FOR THE SECRETARY.—COLAC TO BEECH FOREST RAILWAY.

The items on which the estimate has been reduced, as shown in the Engineer-in-Chief's statement of 21st January, 1899, are—

Clearing and Grubbing.—Estimate reduced from £6,456 to £3,003. The saving is proposed to be made by reducing the quantity of clearing, and taking the risk of accidents from falling timber. A similar course was followed in constructing the coal lines, but it was found necessary on these lines to clear all overhanging trees soon after the line became used for passenger traffic. Such clearing is essential for safe working, and can be done at less cost during the construction of a line than afterwards.

Fencing, Cattle-pits, and Gates are omitted from the new estimate, it being proposed that land-owners shall erect fences and cattle-pits. Unless there is power to compel land-owners to erect fences and cattle-pits the line will probably remain unfenced for a considerable time, in which case it will be subject to a great deal of trespass from stock, and, in addition to the liability to accident through such trespass, the cost of maintenance will be considerably increased by the damage that will be done to the formation, ballast, &c.

Excavation in Cuttings, &c.—Estimate reduced from £16,850 to £11,618.

Provision for Landslips.—Estimate reduced from £1,400 to £1,200.

Excavation in Approaches.—Estimate reduced from £200 to £164.

The explanation given is, "that the quantities and average lead are reduced by the sleeper ruling grade of 1 in 25." This alteration will not seriously affect the cost of maintenance, but it will, of course, diminish the load which can be hauled on the line.

Excavation in Station Grounds.—Estimate reduced from £969 to £807.

The explanation is, "approaches reduced in size." This is a small matter, and in the absence of complete plans of stations no objection can be raised to the reduction.

Timber, Concrete, or Brick Culverts.—Estimate reduced from £4,634 to £3,690.

Explanation—"Timber substituted for brick or concrete in all but very high embankments rendering renewals of timber culverts necessary." If timber of first-class quality is used, no renewals should be required for, say, fifteen years, after which time renewals will be heavy and expensive.

Metalling Roads.—Estimate reduced from £1,283 to £55.

In a wet climate such as this it will not be possible to get traffic to or from the stations in winter time unless a reasonable amount of metalling is done to the approaches.

Ballast.—Estimate reduced from £5,940 to £1,013.

Explanation—"Best material, loam, sand, &c., available at short lead substituted for stone and gravel. Hard ballasting postponed." This item is specially referred to by the Superintending Inspectors in their report of the 6th inst., which is attached hereto, and I entirely agree with their remarks. It would be the reverse of economical to dispense with the use of good ballast on a line of 2ft. 6in. gauge, with grades of 1 in 25 and curves of 2 chains radius, in a wet climate such as that of the Otway Forest. Such a line, if constructed without proper ballast, would undoubtedly be unsafe to work in wet weather; besides which, such an inferior line would cost at least 20 per cent. more to maintain than would a line properly constructed.

Terminal Station.—Estimate reduced from £900 to £500.

Junction Station Requirements.—Estimate reduced from £3,000 to £2,600.

Turntable, Engine Sheds, and Tools.—Estimate reduced from £800 to £300.

Water Supply.—Estimate reduced from £1,000 to £550.

The explanation of these items is, "part accommodation postponed."

I do not see much objection to postponing these works until traffic shows that the higher expenditure is required, but it should be understood that the funds will be forthcoming to complete them when necessary.

Telegraph.—Estimate reduced from £600 to £450.

Explanation—"Inferior poles and trees used." This will probably be found to be false economy.

Provision.—Reduced from £7,134 to £5,151.

Explanation—"10 per cent. in each case." I have nothing to say about this item.

Engineering, &c.—Reduced from £7,894 to £3,338.

Explanation—"Cost of survey to be charged to item 'General Survey,' and not to the line." I have nothing to say about this item.

C. E. NORMAN,
Engineer for Existing Lines.

APPENDIX H.

MEMORANDUM FROM THE SECRETARY FOR RAILWAYS AND LETTER IN REPLY THERETO BY THE CHIEF MECHANICAL ENGINEER.

Victorian Railways,
Commissioner's Office, Spencer-street,
Melbourne, 22nd February, 1899.

Memo.

COLAC-BEECH FOREST LINE.

The Engineer-in-Chief advises that in order to keep the cost of construction of this line within the limit of £60,000 fixed in the Act, he proposes, among other things, to alter the ruling grades as under :—

Section.		Original Proposal.	Amended Proposal.
Colac-Gellibrand ...	Down	1 in 37½	1 in 25
	Up	1 in 37½	1 in 30
Gellibrand-Gardiners ...	Down	1 in 30	1 in 25
	Up	1 in 30 falling	1 in 25 falling

The traffic anticipated is chiefly potatoes, timber, and live-stock, of which the quantities stated in the following table are expected to be loaded at the stations named, viz.:—

Station.	Miles from Colac.	Estimated Tonnage of Potatoes.		Estimated Tonnage of Timber.		Estimated Number of Trucks Live Stock per Week.
		Per Annum.	Average per Day (two months).	Per Annum.	Average per Day (twelvemonths)	
Gardiners	29 $\frac{3}{4}$	1,000	say 20	3,756	12	3
Sixth station	26 $\frac{1}{2}$	500	10	...	...	1
Fifth station	21	300	6	...	...	1
Gellibrand	17 $\frac{1}{2}$	1,200	23	3,756	12	3
Third station	13 $\frac{1}{4}$	300	6	1,878	6	...
Barrongarook	6 $\frac{3}{4}$	100	2	3,756	12	...
First station	4	...	...	...	...	...

A reference to the sections herewith will show that a considerable portion of the line between 12 $\frac{1}{2}$ and 7 $\frac{1}{2}$ miles from Colac will have the ruling grade against the "Up" loading, and, further, that between the points named the rise is continuous.

The Commissioner will therefore be glad if the Chief Mechanical Engineer will say what effect the altered grades proposed will have on his estimate of locomotive working expense for the line.

It should be noted also that the Engineer-in-Chief proposes to use loam and sand for ballast, and postpone hard ballasting.

R. A. McL.,
pro Secretary.

The Chief Mechanical Engineer.

24.2.99/(R).

The Secretary.

COLAC-BEECH FOREST LINE.

The running expenses of the Locomotive Branch will be affected to some extent by the increase in the ruling grade from 1 in 37 $\frac{1}{2}$ to 1 in 30 and 1 in 25, and also by the absence of ballast. The total daily loads to be drawn (as per table) during the potato season would, even with the original grade, be somewhat more than could be taken on single trains, and extra trains would probably have to be run in any case; but, of course, more of them with the increase of grades. These extra trains would probably consist of trips from Colac during the interval between the morning and evening regular trains to the first, second, or third station.

Owing to the increase of grade, the general consumption of coal throughout the year would be greater; and, further, owing to the absence of ballast, trains would necessarily run more slowly, thereby increasing the time of the enginemen, and there would be more repairs, especially as regards springs, wear of tires, motions, &c.

The total extra annual expenditure, which, of course, can only be approximately estimated, will be, in my opinion, about £50.

T. H. W.,
Chief Mechanical Engineer.

MINUTES OF EVIDENCE.

WITNESS.

Rennick, F., Engineer-in-Chief, Victorian Railways	Page
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MINUTES OF EVIDENCE.

TUESDAY, 31ST OCTOBER, 1899.

Members present :

MR. CAMERON, in the Chair ;

The Hon. J. H. Abbott, M.L.C.,
The Hon. D. Melville, M.L.C.,
The Hon. E. Morey, M.L.C.

Mr. Craven,
Mr. A. Harris,
Mr. Styles,
Mr. Trenwith,
Mr. White.

Francis Rennie, sworn and examined.

1. *By the Chairman.*—The Committee is anxious to get some information as to the difference in the prices between the first schedule and the last schedule—take, for instance, the item of clearing and grubbing. The Committee thinks the price is excessive ; it thinks that if the trees were felled 8 feet or 10 feet above the ground, the work could be done for much less?—I do not agree with that view ; I do not think it would be much less.

2. There is an increase in the item “Excavation in cuttings (10 feet formation)—you have added 10,000 cubic yards to the schedule you submitted to the Committee for consideration—is that necessary?—The excavation of cuttings has been re-arranged, the total quantity is the same as before ; the difference between 179,000 cubic yards and 190,000 cubic yards consists of the block cuttings in the station grounds—that has been included in that item in the revised schedule and taken out of excavation in station grounds in the original schedule, where you will see 15,000 cubic yards provided as against 4,200 cubic yards in the present schedule—it has simply been transferred from one item to another ; the total quantity remains the same. In the one case it was an estimate based upon a trial survey taken out in the usual way ; in the other it was carefully taken out from the permanent survey with a view of letting the contract, and the figures were re-arranged for that purpose. The “Remarks” column explains the difference.

3. That is since the Committee reported on the Beech Forest line?—Yes, because the revised schedule was not made out until it was proposed to let the contract, and after the permanent survey was made. You had not the revised schedule before you when you reported.

4. How is any Committee to decide upon a thing that does not exist at the time the matter is referred to them?—The information that was placed before you was derived from the trial survey, and was sufficient, in my opinion, to give any one a knowledge of what the works would be likely to be, and how the approximate estimate was arrived at.

5. The item “Excavation in foundations to culverts, &c.” is given at 2,400 cubic yards in the original estimate ; now you put it at 4,000 cubic yards—how was the Committee to know it would be increased by that quantity?—I did not know, any more than the Committee ; but that is the result of the careful permanent survey. A permanent survey never makes the works, especially in difficult country, the same as the trial survey. The estimate from the trial survey has to be taken with a good deal of give and take, and there is always a percentage added for contingencies.

6. You still adhere to the £1,400 for landslips?—Yes ; it is explained in the margin that that is added to the cuttings.

7. Is that a thing that you have to cope with in the first instance?—That is one of the things that I apprehend will happen ; it is very likely to happen.

8. Then it should be put down in the contingencies?—I considered it necessary to make a special provision for that, because the country is so liable to slip. The cuttings are very deep, and, judging from our experience in the coal country at Korumburra, I apprehend that the country will slip more or less.

9. *By Mr. Craven.*—What will be the general run of the deeper cuttings?—They go up as high as 30 feet or 40 feet, and on sideling ground it might be even 50 feet.

10. *By the Chairman.*—You reduce the item “Excavations in approaches, roads, &c.”?—Just in the same way ; that is from a more careful survey.

11. You can do with less now?—Yes.

12. *By the Hon. J. H. Abbott.*—Is this statement final, or is there any chance of the figures being altered again?—No doubt the construction of the line would vary from these figures, because we might encounter things we do not expect, and changes are made in the design for the work as we go on ; that is always done in every railway, and in railways in difficult country it is done very largely. There was a celebrated line let in Queensland for a very small amount, but I think the final cost was three or four times what was contemplated.

13. We would not be justified in anticipating anything like that in this case?—Not to that extent, of course.

14. *By the Chairman.*—“Excavation in station grounds” has been reduced from 15,000 cubic yards to 4,200 cubic yards?—That difference is included in the excavations for cuttings—that is part of the 190,000 yards for cuttings, which was originally 179,000 yards. It is simply a transfer to another item—a re-arrangement of the schedule to suit the contract, and make the contract binding and definite as far as possible.

15. You have reduced the price for timber bridges from £2 4s. to £1 12s. 10d. per foot?—Yes, because the permanent survey enabled us to substitute banks for tall trestles, and so the bridges for the revised line would not be so much as were contemplated in the trial survey.

16. You think the latter price is as good as you thought the former price was at the time?—Yes, based on the same rates for labour, to meet the modification of the works derived from the permanent survey.

17. You have metalling and gravelling roads at 4s. 7d. per cubic yard—is that the cost generally?—It varies according to the nature of the stone that you get and have to break and put on the line, the difficulty of transport, and the distance to the place where you have to put it.

18. Did you find out that the metal is not to be got at the same places where it was to be got before?—No, it is simply a more careful forecast, that is all.

19. You reduce the cost of ballast from 4s. 5d. to 3s. 7½d. per cubic yard?—That is based on the schedule prepared for the contract, in which there are three classes of ballast provided—gravel, broken stone, or scoria, and that is the average price of those three items, as we priced them in the schedule proposed for the contract.

20. The amount is the same?—Practically, the amount is the same. These are only estimates, and one has to be guided by the best light he can get. Estimates are estimates, and are very seldom realized in carrying out any works, much less railway works.

21. *By the Hon. J. H. Abbott.*—The estimates are generally exceeded?—That has been our experience, but I hope, in this case, they will not be.

22. *By the Chairman.*—Since you have had charge of the Railway Department, have not your estimates oftener been above the mark than under?—Yes, and I hope they will continue to be so. I desire to make perfectly safe estimates, and not to mislead the country or the Government.

23. Your success in that way has not been in work done under contract?—No; with the butty-gang system we have reduced the cost very materially.

24. For sleepers you still adhere to 1s. 6d. as the price?—Yes, because although we will get supplied with sleepers at a much lower rate than that, they have to be conveyed to the place where they will be put on the line, and they have to be adzed, and the rails fastened to them. Moreover, during the platelaying and ballasting, a large expenditure is incurred in keeping a top on the road, for the running of the trains, and that has to be put down in some item; my practice is to put it down to the sleepers and the ballast, and that is a very large item of expenditure in the construction of a railway.

25. What do the same kind of sleepers cost you now?—We are not getting any in the Beech Forest. On the Gembrook line we are getting them as low as 9d. each and up to 1s. 2d., and then there is a lot of work upon them after that, so that you cannot judge what sleepers cost you by the quotation of such prices as those.

26. Do you think there should be any difference between the price of sleepers in the Beech Forest and in the Dandenong Forest?—Yes, I think it would be more difficult to get sleepers for the Beech Forest line; the country is more precipitous.

27. *By Mr. Trenwith.*—Will you not have the timber all along the line?—In places we will, but on a large portion of that line the timber is killed.

28. *By the Chairman.*—Is not 20 miles of the Beech Forest line much more come-at-able than the Gembrook line?—For the first 18 miles, to the Gellibrand River, there is little or no timber fit for sleepers, and they will have to be brought from some distance.

29. Is not the messmate in that locality good?—Nearer the river it is, but near Colac there is none. I may be quite wrong in my opinion of the prices, but these are my opinions. That is one of the things that have been made a great handle of, and you have had evidence to show that you can get them for 6d. apiece.

30. No; 8d. was the lowest for sawn sleepers where there would be no adzing required?—Possibly; we very frequently get hewn sleepers cheaper than sawn ones. There are two kinds of adzing—there is the adzing of the sleeper out of the round sticks, and the adzing of the sleeper to receive the rails.

31. *By Mr. Trenwith.*—Preparing and handling the sleeper is added to the cost?—Yes, and also the maintenance of the road. A portion of that expense is put down to the sleepers.

32. *By the Chairman.*—In your original estimate you allowed 10 per cent for contingencies; you have now reduced it to 5 per cent. Why was that reduction made?—We have considered what would be required more carefully for a contract than we did in the rough estimate from a trial survey, and I consider 5 per cent. is sufficient on the revised schedule.

33. The item "Engineering, surveying, and general supervision" is increased by about £1,100?—Yes, because we found the cost of surveying that line has been so large that we had not provided sufficient in the rough estimate.

34. Do you include all the surveys that have been made in that forest in that item?—All the surveys made from Colac to Gardiners in the Beech Forest where this line terminates.

35. How many lines have been surveyed?—A good number; I could not say how many. I should say three or four, or even more if you include all the rough surveys that were made before the permanent line was located.

36. *By Mr. White.*—What is that item charged to if no line is constructed?—The item of general surveys in the Railway balance-sheet.

37. *By the Hon. D. Melville.*—Does that £9,000 include the old broad-gauge survey?—No.

38. Then you charge the broad-gauge survey to the narrow-gauge line?—I am not quite clear as to that, but it certainly includes all the narrow-gauge surveys. The amount here of £9,000 has to include, and does include, the cost of the preparation of all the drawings and all the office work that has been done in connexion with this line up to the present stage, and has to cover the engineering and supervision of the construction.

39. *By the Hon. D. Melville.*—This money is irrecoverable in any case?—£6,000 has been absolutely spent. That sum goes into the item of general surveys in the Railway balance-sheet, and when the line is constructed it is taken out of that and transferred to the cost of the line.

40. *By Mr. Trenwith.*—The Kerumburra to Outtrim line runs through similar country to this?—Yes.

41. What did you pay for excavation there?—It cost us up to 2s. 6d. per yard for the excavation in rock.

42. Do you expect to have any excavation in rock in this case?—Not so hard as that, but we will have sandstone, slate, and schist.

43. What did you pay for excavations in earth, for cuttings and formation?—I cannot say, but in the Railway Report for 1897 you will find details of the cost of all the lines constructed up to that date—it may not give the rate per yard, but it will give you the cost of the earthworks.

44. For "Excavation in cuttings (10 ft. formation)," 1s. 4d. per yard; that seems a high price?—It certainly is a high price, according to the evidence you have got, but that evidence I should discount, because the people who tendered it knew nothing of railway construction. These cuttings are only 10 feet wide at the bottom and there is not room for two drays to take them out completely. The cuttings are narrow and there is a great deal of trimming required to make the cuttings the exact size, because there is no margin in the width; it is the minimum width we are adopting and it must be taken out fully to that extent.

45. You say you are getting sleepers as low as 9d. in connexion with the Gembrook line—is the Gembrook country more or less difficult for getting sleepers?—I think it is less difficult.

46. Taking that part of the Beech Forest line where all the timber has not been killed, do you think it is more difficult there?—Yes, in the Beech Forest it will be more difficult to get the sleepers to the line, on account of the precipitous and broken character of the country.

47. Is it not possible that the sleepers will be got from a part of the forest where the timber has not been killed, and is actually on the line?—Yes, we expect to get some sleepers from the trees we have to cut down in the clearing, but I do not think we will get a very large number in that way.

48. *By Mr. Craven.*—Suppose that you had this work to carry out on the butty-gang system, could you carry it out cheaper than the contractors have offered to do it for in their tenders?—Not much. I consider the lowest tender was low, but there is this to be said—if the contractor did the amount of work scheduled he would be paid the full amount of his contract, and, even under those conditions, there might be large claims for extras which would have to be met, and that might bring up the amount considerably in excess of his tender; but in doing the work under the butty-gang system, I consider my estimate a safe one, and we would not exceed it—we would probably save on it.

49. Would it have increased the length of the line materially if you had kept more on the rising and falling contour, rather than have gone into so much cutting?—Yes, it would.

50. You gave us a reduced estimate of £50,000 with a gradient of 1 in 25. You say you could make a line similar to the one from Zeehan to Dundas, but with a gradient of 1 in 25. Would it materially increase that £60,000 to make it a gradient of 1 in 30?—You have all that information in the comparative quantities; you have the estimate for the earthwork in each case. The permanent survey provides for a 1 in 40 grade to the Gellibrand, and from the Gellibrand to Gardiners 1 in 30 is the ruling grade; altering that to 1 in 25 would reduce the amount as shown here. There is also £3,000 taken off the item of clearing—that would mean clearing a narrow track and taking the risk.

51. Taking a similar type of line, but with a gradient of 1 in 30 instead of a gradient of 1 in 25, what would it cost?—You would have to add £5,000 or £6,000 to the previous estimate.

52. Taking the item "Engineering, surveying, and general supervision," is a proper proportion of your salary and the salaries of the various officials in the Department engaged in the work included in that item?—Certainly, every charge for the head office and the field and everything that could be fairly charged to the line is included.

53. It is all in the £9,000?—Yes, it is all there.

54. *By the Chairman.*—Is there any uphill grade between Gardiners and the Gellibrand, coming down to the Gellibrand?—I am not quite sure, I hardly think there is—it is nearly all down hill.

55. On what part of the line would a gradient of 1 in 25 occur coming from Gardiners to Colac?—All over the line, in places—wherever we have 1 in 30 now it would be modified to 1 in 25, where it would effect economy in the earthworks. Where it would not effect economy there would be no alterations made.

56. Except for economy there would be no need to have a 1 in 25 gradient from Gellibrand to Colac?—No, it is purely as a matter of economy.

57. Is it not a comparatively easy country?—It is much easier than the other part.

58. *By the Hon. D. Melville.*—Have you any suggestions to make on the matter of making the line more remunerative. We estimate that with an expenditure of £60,000 there will be a deficiency of £371 per annum; with your £83,000 the deficiency would be increased. Can you make any suggestion to the Committee with a view of lessening that loss?—I would not recommend an inferior railway to what was designed, but if somebody else took the responsibility you could reduce the cost in any of the ways that I show in my comparison between the £60,000 and the £86,000. I think it would be highly undesirable to alter the gradient, but you could do with less clearing, less ballast, no fencing, and a mere skeleton equipment at the stations until it was seen what the traffic would be. I apprehend, however, that when Mr. Mathieson got the line into his hands he would immediately ask for more money to bring it up to what he considered such a line should be, with the result that it might cost more than I provided for those items in the original construction of the railway. I have not to make railways to work them myself, I have to make railways that will be accepted by the working branch of the Department; they have their ideas as to what works are necessary, and it is my duty to estimate for those works.

59. You cannot suggest anything to get rid of this annual loss?—No; but I should say that a line which promised so much traffic as only to incur the loss estimated by the Commissioner in the first instance, and running through such country as there is in the Beech Forest, might be expected in a few years' time to develop into a paying line.

60. Can you give us an example of such a line as that in Victoria?—No; we have no experience that would bear out that view, but I do not think we have had any similar case to the Beech Forest where the construction of a cockspur 30 miles long would tap such a large extent of good country, and if the cross line is made connecting the Beech Forest with Ballarat, it seems to me there ought to be a very good future for the timber of that district.

61. *By Mr. Craven.*—In that case would not the break of gauge be rather a drawback?—It would be a detriment, undoubtedly; but, notwithstanding that, I think the Ballarat mining district would draw a considerable proportion of its supplies of mining timber from the Beech Forest.

62. It is generally reported that you have stated you could make an efficient line there for £70,000?—I have not stated any such thing as that. I can make a better line for £70,000 than for £60,000.

63. You have not stated that to any one?—Certainly not. I have stated that the line could be made for £70,000, undoubtedly; but not such a line as I think ought to be made, or that the Commissioner would be prepared to take over without further expenditure.

64. What is the lowest amount that you would be prepared to make an efficient line for?—We might save the 5 per cent. for contingencies or some portion of the money provided for slips. My estimate was that the line could be opened for public traffic for about £80,000 or a little more.

65. *By Mr. Trenwith.*—That is for a line that the Commissioner would take over?—Yes.

66. *By Mr. A. Harris.*—Would that line, if constructed, necessitate much cost for maintenance afterwards?—The mere maintenance would not be more than if it cost the higher figure, but during the first three years the Commissioner might have to ask for more money to equip the stations if the traffic developed.

67. *By Mr. Trenwith.*—What are the elements of danger in the Dundas and Zeehan line?—The trees falling on the line is one danger.

68. You mean danger to the train?—Yes.

69. I assume that in that country, and on such a line, the train would only travel in daylight and at a slow rate of speed?—Yes; but in going round curves, if the train is going at the rate of 15 or 20 miles an hour, and there is a tree across the road, the driver cannot see it and pull up in time, so there would be a smash. There would be a great deal more risk of that in the Beech Forest line, because the trees are so much higher than on the Dundas line.

70. The country is not so precipitous?—No, but that is a special line of railway practically made all the way out of sideling.

71. On the Dundas line a tree might fall half-a-mile off and come on to the line?—I do not think so.

72. You do not think there would be any material saving by cutting the trees 10 feet up from the butt. Have you seen any of that work done?—Yes, plenty.

73. What is the difference in area between 2 feet from the ground and 10 feet?—Taking the mere circumference, there would be a large difference; but, generally speaking, those large trees are hollow, and the hollow 2 feet from the ground is larger than it is 10 feet up. Then you have to make a scaffold when you cut the tree higher up, and that costs time and money, so that I do not think that there would be a great saving. Moreover, we provide for some of the clearing to be done in that way where the trees are a safe distance away.

74. I suppose the reason of that is economy?—Yes, in that case if the contractor prefers to do it there is no objection.

75. You do not know from actual experience what the difference is?—No, I never timed a man. A tree is likely to come down with less cutting at the bottom than 10 feet higher up, because there is more leverage for the wind to play on.

76. *By the Hon. E. Morey.*—For what width do you intend to clear the line of timber?—On the first portion the clearing would be light, and the width there is only 60 links on each side, which will be quite sufficient, but when you get into the Beech Forest you will have to fell trees 200 feet away from the centre line because they are so tall that if they fell they would reach the railway.

77. Would not those trees be good for market purposes?—Most of them are dead. They have been rung by the selectors.

78. They would be no good for a saw-mill?—No.

79. You put down £250 a mile for clearing, is not that a big price?—It has cost as much as £500 on the Korumburra line.

80. Were the clearers good bushmen?—We engaged the best axemen we could get—you must remember that farmers pay their men 10s. or 15s. a week, and give them their rations, whereas we have to pay 6s. or 7s. a day.

81. It comes to about £27 an acre?—Some of it might come to that.

82. Do you not think you are giving a high price for fencing—you put down £40 per mile?—Not quite; I think it is a little over £30—there are so many twists and turns and angles in that fencing.

83. They have the timber on the ground?—Yes, but the timber is only for the posts; it is a wire fence with posts 25 feet apart—what we call a dropper fence. Wire, both steel and iron, has gone up 50 per cent. of late; we are doing the fencing on some of the mallee lines at a little over £25 per mile, but fencing in the Beech Forest is a totally different thing.

84. *By the Hon. J. H. Abbott.*—Has there ever been any case of an accident occurring through the falling of timber on any of our railways?—Yes, I think so; there have been some very narrow squeaks where a tree has been discovered by the repairers just before the train has passed. In the case of the coal lines at Korumburra, we adopted the system of partial clearing only; we thought it would do very well for coal trains, but as soon as the traffic developed, and they had to carry passengers, there were hundreds, and perhaps thousands, of pounds spent in additional clearing at the instance of the Railway Commissioners.

85. *By the Chairman.*—Have you seen much of the forest cut down for splitting palings?—No.

86. Have you been on the Plenty Ranges?—Yes, I have been over a part of the Plenty Ranges.

87. Have you seen the splitters there cut down a tree for splitting purposes lower than 8 feet from the ground?—I cannot say I have. I never noticed it. I have seen timber cut as has been suggested 10 feet or 12 feet from the ground, but those would be solid trees, and in that case it would make a great difference—it is not of such importance in cutting hollow trees.

88. Are they all hollow in the Beech Forest?—Nearly all the large trees are. I do not know that I have seen a large tree in the forest that was a good sound tree.

89. *By Mr. White.*—It would save the removing of that 10 feet or 12 feet?—Yes, but you would also incur the risk of fire if you leave a tall stump near a line of railway; if a bush fire gets into that stump it may set fire to the line, or scorch the train. There is provision, however, in the specification for

trees outside a certain distance of the line to be cut down in that way, if the contractor can save anything by it.

90. *By Mr. Trenwith.*—That provision does not save you anything?—Yes, because he takes that into account in framing his tender.

91. If it is a fact that four trees can be cut at that height where one could be cut close to the ground, would not that be a great saving?—Certainly, if such were the case.

92. Assuming that a tree is 60 feet in circumference 2 feet from the ground, what would be its circumference at a height of 12 feet?—You could count the trees in that forest 60 feet in circumference on one hand.

93. But what would the difference be?—There would be a considerable difference; it might be 20 feet in diameter 2 feet from the ground, and only 15 feet in diameter 12 feet up.

94. *By Mr. White.*—Do you cut the trees down if they lean away from the line?—Yes, some, if they are unsound trees.

95. *By the Chairman.*—Have any broad-gauge surveys of this line been made recently?—No, I do not think so; there may have been an investigation to see what route the line would take if the broad gauge were adopted, but there has been no large amount of money spent on any recent broad-gauge surveys there.

96. *By Mr. Craven.*—You say “Engineering, surveying, and general supervision,” £7,894; have you the schedule from which that has been prepared?—No, that is one of the items that has to be lumped; we base it on the cost of similar work on other lines.

97. Is there not an account kept of all the surveys in connexion with that line and a certain proportion taken?—Yes. A strict account is kept of the cost of the surveys, but this item provides for engineering and supervision—that is worked on a percentage; it may be 5 per cent., 7 per cent., or 9 per cent., just as we anticipate difficulties.

98. The item of surveys would be a fixed amount?—That can be ascertained when the surveys are completed; the railway bookkeeper should be able to say what they cost. I think the Commissioner states in one of the papers before the Committee what the surveys have cost.

99. Is there sufficient information to enable you to estimate approximately the length that the line would really be if it were all in side cutting?—The line would have to be laid out afresh. I do not know that you could even realize that idea in that country. The line is simply a line laid out with a limit of grades and curvatures, and also with a view to economical working and maintenance—that is to say, curvature is reckoned as so much, extra length as so much, and so on.

100. The Zeehan and Dundas line is practically in side cutting, except where you go through sharp points?—Yes, it follows in the most slavish manner the contour of the country; to reach one point which is only $5\frac{1}{2}$ miles as the crow flies from another, the line meanders for $12\frac{1}{2}$ miles.

101. If you had laid out that line you would have gone in for more cuttings and embankments?—Yes.

102. Would not that have materially increased the cost?—No, I think with very little more expenditure a much better location could have been obtained.

103. *By the Hon. D. Melville.*—Have you plenty of old rails to use?—No, we have not; they are scarce.

104. What would those second-hand rails, which you now put down at £10,000, cost when they were new?—More than double, nearly three times that price—those rails are twenty years old.

105. *By Mr. Styles.*—What are they charged at now?—£2 15s. a ton.

106. Twenty years ago they would be £8 or £9 a ton?—Yes, or £7 at any rate.

107. *By the Hon. D. Melville.*—As a matter of fact, if you have the old rails there is no outlay?—Yes, the Commissioner would make it an outlay when he got the money to credit to his account.

108. You say that £6,000 of this £9,000 for surveys is already spent, so if we wipe that out and the money for the rails, the State does not lose much, because the money is already spent?—Yes, the money is spent, and you cannot recover it.

109. *Cassier's Magazine*, which contains the latest information on electric railways, says—“The European practice for light railways, assuming a gauge between 24 and 30 inches, indicates the use of rails weighing about 25 lbs. per yard”—that is the new steel rails?—They used those at Mount Lyell, and when they were down two years they were taking them up and laying a 35 or 40 lb. rail on a 2-ft. gauge line, so their experience was that that was a mistake.

110. The article goes on—“Ties, spikes, and miscellaneous supplies we may reckon at £100 per mile, if wooden ties are used, as would generally be the case”—is that correct?—I have no reason to doubt that. Those would probably be fir sleepers. I do not think that is the newest idea. I think it is about the oldest idea in connexion with the narrow-gauge railways. The newest idea is that that flimsy construction is totally unfitted for rough country where you have heavy grades and sharp curves—it is simply throwing money away.

111. “In fairly easy country grading and surfacing will amount to, say, £120 per mile, and laying and ballasting to about £100 per mile more. This brings the total up to £660 per mile, and adding, say, £40 a mile for engineering and miscellaneous expenses, we may fairly say that £700 per mile will put down a good substantial narrow-gauge track under ordinary conditions”?—I do not believe a word of it in any country in the world—the last qualification kills the whole thing.

112. They are constructing these lines to-day?—How many miles have they constructed at that price? This is perfectly new to me. If you look at the statistics of the cost of railways in any country in the world you will not find such figures as those.

113. *By Mr. Trenwith.*—Have you been over any of the Queensland lines?—No.

114. Have you seen any of the half-round sleepers used?—Yes, they were put in the main line here years ago.

115. Is there any economy in using them?—There is a little, but when you consider the amount of labour on them and the maintenance, our experience is that they are a mistake.

116. Is there more maintenance in connexion with them?—Yes, you get all the sap wood; they are inferior in every respect.

117. *By the Chairman.*—Do they bend up at the ends?—All our sleepers do that more or less; the men often pack the ends when they should not.

118. *By Mr. White.*—Do you say that if you were constructing the line yourself you would not reduce the construction to a lower amount than £80,000, but you might get the line constructed for less if some one else had to take charge of it?—I say I can construct a railway for £60,000, but I would not recommend it as a proper railway for the district.

119. *By Mr. Craven.*—Do you think a railway constructed for £60,000 would be taken over by the Commissioner?—I do not think it would.

120. *By the Chairman.*—What induced you to offer to construct it for £60,000?—The Act prescribes £60,000 as the total cost of the line. I had to advise the Minister as to what could be provided for that money, my estimate being £86,000.

121. Did the Commissioner object to a railway at £60,000?—The Minister sent the papers to the Commissioner for his views, and the Commissioner made a report which I think the Committee have got.

122. Did that induce you to make another estimate of £83,000?—No; if you have the complete file of papers you will see that the papers were returned to me by the Minister, to prepare the drawings, with a view of letting the contract for such a line as would be taken over by the Commissioner, and I prepared them—that is the £86,000 estimate.

123. *By Mr. Trenwith.*—That is based upon the lines of the £86,000 estimate, with more complete information?—Yes.

124. *By the Hon. J. H. Abbott.*—Has there ever been a line of railway constructed in this colony that the Commissioner hesitated or declined to take over?—Not that I am aware of; but we have never constructed such a skeleton line as would have to be constructed in this case for £60,000.

125. *By the Chairman.*—Did the Commissioner object to take over the Katamatite line?—I cannot say; but I think he recommended a considerable expenditure on it.

126. Did the Commissioner tell you that he would not take over this line if it were constructed for £60,000?—He did not tell me, but he put in his report, and after that I prepared an estimate for £83,000.

127. The Government took the Katamatite line over as a skeleton line?—Yes.

128. *By Mr. Craven.*—Has the Koondrook line been taken over?—No.

129. *By Mr. White.*—Leaving the Commissioner on one side altogether, if you had to construct this line, and have the supervision of it afterwards, could you make a line that would suit that district for a great deal less money than you have recommended?—No; I would have to consider that, although I might be engineer for maintenance, I would have no control over the traffic, and the people who had the ordering of the trains would have their views as to what works were required to make the line safe and complete, such as goods sheds, metalling, platforms, and that sort of thing.

130. But supposing that you had to work the traffic yourself, with the experience you have had in the construction of lines, could you not make a line that would serve the district at a much less price?—You could make a line and take the risks. For instance, with incomplete clearing, there is a risk of accidents; with no fencing, cattle would trespass on the line.

131. Would you be frightened to take such risks?—Yes; I would not take those risks.

132. *By Mr. Trenwith.*—Could not some deductions be made from the cost without taking risks; there is no less risk of accident with a fully equipped station than there is without. Then, travelling slowly, and in the daylight, is there great risk in doing without fencing?—Yes, I think there is a risk; there have been terrible accidents from collisions between trains and cattle and horses in this country. I know of two or three serious ones.

133. In daylight?—Yes, when the contractor was ballasting the line.

134. *By the Chairman.*—Do not those accidents also happen when the line is fenced?—No. Of course, when the cattle get on the crossings you take a risk.

135. *By Mr. White.*—What is the reason you increase the length of the fencing; your first estimate was only 30 miles, now it is 59 miles—do you fence the whole line in the second estimate?—My idea in the first instance was that partial fencing in the most dangerous places would do, and that the rest of the fencing might be erected during the first three years. The provision of 10 per cent. was to cover such contingencies as that, but the Commissioner said in his report that an unfenced line in any part would not be a proper thing at all, so I added the cost of the fencing to the estimate.

136. Would the 5 per cent. include the extra fencing?—No, that is already provided for in the schedule; the 5 per cent. is to cover other contingencies and miscellaneous works.

The witness withdrew.

Adjourned.