(No. 60.)

1875.

TASMANIA.

HOUSE OF ASSEMBLY.

MAIN LINE RAILWAY.

ADDITIONAL CORRESPONDENCE.

Laid upon the Table by the Attorney-General, and ordered by the House to be printed, August 17, 1875.

MAIN LINE RAILWAY CORRESPONDENCE.

Additional Correspondence in continuation of Paper No. 29.

Colonial Secretary's Office, 16*th July*, 1875.

My dear Sir,

You will remember that, about eighteen months since, it was thought desirable to invite Mr. Greene to visit Tasmania and take a look over the Main Line Railway, and report thereon for the information of our Parliament. As the Railway is now rapidly approaching completion, we have invited Mr. Greene to pay us another visit; and with your permission he will walk over the Line, and give us a further report for the information of our Parliament.

Will you kindly favour me with a letter authorising him to proceed along the Railway and make his observations?

I have, &c.,
(Signed) THOS. D. CHAPMAN.

C. H. Grant, *Esq.*, *Engineer-in-Chief*,
Main Line Railway Company.

MEMO.

Upon receiving this letter, Mr. Grant immediately called on the Colonial Secretary and expressed his readiness to afford Mr. Greene every facility for inspecting the Railway and works.

THOS. D. CHAPMAN.

Colonial Secretary's Office, 6 p.m. *July* 16*th*, 1875.

Colonial Secretary's Office, 17*th July*, 1875.

Sir,

In the interview you had with me yesterday I explained to you the nature of the inspection I wished you to make of the Main Line Railway and works; I have now the honor to forward a memorandum which will probably more fully convey to you the wishes of the Government.

I have, &c.,
(Signed) THOS. D. CHAPMAN.

W. H. Greene, *Esq.*, *Ship Hotel*, *Hobart Town.*

Colonial Secretary's Office, 17*th July*, 1875.

MEMO.

The following are the principal points upon which Mr. Greene is requested to report upon for the information of the Government in reference to the Main Line Railway between Hobart Town and Launceston:—

1. The character and quality of the works now completed and in course of construction on the Main Line Railway, classifying the works under the usual headings of Earthworks, Ballast, Permanent Way, and Rolling Stock, having reference to those clauses in the Contract with the Tasmanian Main Line Railway Company which provide for the said Railway, together with all

Stations, Rolling Stock, and all other works connected therewith being of the best material and of a thoroughly substantial character, and that the Ballasting the Line of Railway is also in accordance with the Contract.

2. In Mr. Greene's last report he stated that in his opinion such a line of railway as the Contractors are constructing could be completed for £4500 per mile; or, in round numbers, from Hobart Town to the Evandale Junction for the sum of £540,000. Does he see any reason to alter that estimate of the cost of the Railway?

3. Would he recommend the Government to have an inspection of the railway and rolling stock to be made before the line is opened for traffic?

4. Will he be good enough to state whether he considers the conditions of the Contract can be carried out with regard to the speed at which two daily trains shall run each way between Hobart Town and Launceston, having a due regard to the safety of the lives of the passengers?

5. From the present condition of the Railway and works, will he be good enough to state at what period the Railway and works should be ready for opening, provided the Contractors use due diligence?

6. Mr. Greene will be good enough to make any other observations that he may consider useful for the information of the Government.

(Signed) THOS. D. CHAPMAN.

W. H. GREENE, *Esq.*, *Ship Hotel, Hobart Town.*

Kyneton, Victoria, 12th August, 1875.

SIR,

I HAVE the honor to acknowledge the receipt of your letter of the 17th ultimo, in which you enclose a memorandum of the principal points in connection with the Main Line Company's works upon which you desire information; in reply I beg to submit the following Report.

I inspected the Railway works between Hobart Town and Launceston, and for the greater part of the distance I was accompanied by Mr. Grant, the Company's Chief Engineer, who very kindly gave me every information, and to whom I am indebted for the use of trains, engines, &c. to go over those portions of the line where the rails were laid.

In reporting on the several classes of work I propose to follow the same order in which they were dealt with in my previous Report to you dated the 9th April, 1874.

Earthworks.

The earthworks, with the exception of trimming the embankments, a work which is usually deferred until they are settled by the weather, are all completed, and do not call for special notice.

I observed two slips in the slopes, one in a cutting near the south end of the tunnel at Flat-topped Hill, and the other in an embankment not far from the same place. They are not at present very important, and I believe can be remedied by the usual expedients, viz. the removal of the loose ground and thorough drainage.

Bridges.

The bridges, most of which were in progress when I visited the works last year, are now completed, and although there is a good deal of rough work in them, they appear with one or two exceptions to be substantial enough.

I am unable to say, of course, whether the covered portion of the work is equal to the exposed masonry, or if the foundations have been put in sufficiently deep.

The south abutment of the bridge over the Hunting Ground Rivulet near the Corners, which is of rough rubble bluestone masonry, is failing, and must shortly be rebuilt.

The pile bridges, especially that over the South Esk at Clarendon, appear to be sound and sufficient.

The iron swing bridge over the River Derwent at Bridgewater requires some slight additions, which Mr. Grant informs me are now being provided.

The sleepers carrying the permanent way on the principal bridges are fastened to the longitudinal stringers, whilst the bridges at the Risdon Road and the York Rivulet have a platform with ballast for the reception of sleepers; this latter is much the better mode of construction, the vibration of trains having a most injurious effect on bridges when the permanent way is fastened to the superstructure.

Tunnel.

The tunnel at Flat-topped Hill is completed, and the ballast and material trains are now running through it. The material through which it is driven is freestone, and in several places required to be lined; this has been done in rather a rough though apparently a strong manner, the side walls being of masonry, with brick rings to support the roof.

It may be necessary hereafter to line other portions of the tunnel, as the action of the atmosphere will in time probably affect the stone; but additional lining, if it should be necessary, could be put in without interrupting the traffic.

I do not anticipate any difficulty in working the trains through the tunnel,—it is perfectly dry except for a few yards at the lower end, where a spring has been tapped.

Culverts.

Most of the culverts had been completed at the time of my first inspection, and a few of those I then complained of, near the northern end of the line, have been repaired and improved; the majority, however, of the culverts north of the Flat-topped Hill can neither be regarded as sound nor substantial, the work in many of them cannot be classed as masonry of any description, nor can the stones used in the floor of the culverts be called inverts.

Fencing.

The fencing is completed: a great portion of it is of very indifferent quality, and although sheep proof is not in many places sufficient to prevent trespass of cattle.

The greater portion of the line in the Midland district is enclosed with a fence of one rail and five (5) iron wires of very light gauge.

Ballast.

The ballasting, which is a most essential feature in railway construction, is, I regret to say, of exceedingly bad quality.

Near the Hobart Town terminus, and in some short lengths along the line in the Middle and Northern Districts, there is some good ballast, but it bears an insignificant proportion to the whole.

The material used is of all sizes and descriptions, and in all stages of decay, and it will be impossible to maintain a good road unless the line is re-ballasted.

Some of the sand used for ballast on the Northern sections of the line, which I noticed in my previous report, has been covered with shingle to prevent its being blown away; but this expedient will only last until the line is opened up for repairs, when the sand will come to the surface, and be either blown or washed away.

The ballast is certainly not of the depth (18 inches) specified in the Contract; the contract quantity may, however, be supplied before the line is completed.

Sleepers.

The sleepers on the Southern portion of the line are for the most part square, and of the dimensions specified in the Contract,—in other districts half-round sleepers, cut out of young trees, are used, and the sap-wood being left upon them, they must very soon decay.

Permanent Way.

The Permanent Way has been laid from the Southern end to Lake Tiberias, about forty-nine (49) miles distant from Hobart Town, and at the Northern end of the line between Tunbridge and Evandale Station, on the Launceston and Western Railway, from whence a third line has been laid along that railway into Launceston Station.

I do not consider that sufficient care has been exercised in laying the Permanent Way, as the sleepers are not evenly adzed, or the rails carefully bedded upon them; want of care in this respect will give a great deal of trouble in keeping the line in good running order.

I should have preferred to space the sleepers somewhat differently, so as to strengthen the rail joints, and thus secure a greater uniformity of strength and elasticity; the joints now are evidently weak, and this defect is readily observable when an engine passes over them.

The third rail laid between the two rails of the Launceston and Western Railway is not properly secured, the iron-dog fastenings being too short to take a sufficient hold in the sleepers. This can easily be remedied by using fastenings of a sufficient length; it is a matter, however, which must be attended to before the line is opened for traffic.

The tyres of the rolling stock are cylindrical, and not coned as is usually the case on broad-gauge and on some narrow-gauge lines; the rails are therefore laid upright, instead of being canted to meet the inclination of coned tyres. This gives rise to a difficulty in using one of the rails on the Launceston and Western Railway, between Evandale and Launceston, the rails of which are canted, and when the narrow-gauge stock is used on that portion of the lines, the wheels on one side will be running on the outside edge of a canted seventy-two pounds (72 lbs.) rail, while the wheels opposite will run on the top of an upright forty pounds (40 lbs.) rail. This will injuriously affect both the Launceston and Western rails and the tyres of the Company's stock, and will give rise to serious inconvenience, which can only be avoided by laying a fourth rail.

The rails themselves are evidently of a very mixed quality, a large number show signs of failure, and many have already been taken out of the road; this doubtless is, in a great measure, attributable to the excessive weight of the locomotives, but partly also to the indifferent quality of the iron used in the manufacture of the rails. A number of damaged rails I observe to be branded "I.S.R.," being originally intended for the Indian State Railways.

I regard the premature wear of the rails as a very serious matter; rails weighing only forty pounds (40 lbs.) to the yard have no strength to spare, and when they show signs of failure must promptly be removed.

Level Crossings.

Gates have been fixed at the Main-road crossings, and at many other places where cattle-guards were formerly provided.

Huts for the gate-keepers have yet to be constructed at many of the crossings.

Rolling Stock.

I am indebted to Mr. Grant for the following statement of rolling stock provided and being made:—

Provided—

- 11 Locomotive Engines.
- 8 First-class Carriages.
- 2 Composite Carriages (1st and 2nd class).
- 12 Second-class Carriages.
- 4 Passenger Break Vans.
- 10 Cattle Waggons.
- 20 Covered Goods Waggons.
- 40 High-sided Goods Waggons.
- 20 Low-sided ditto.
- 20 Ballast Waggons.

Being made—

- 25 High-sided Goods Waggons.
- 25 Low-sided ditto.
- 6 Horse Boxes.
- 4 Goods Break Vans.
- 20 Double-tier Sheep Waggons.

Of the eleven (11) locomotives, two are small engines used by the Contractors in the construction of the line, and are of very limited power, and having rigid axles are not suited to the curvature of the line.

Two of the locomotives last imported are intended for express passenger traffic, and have four wheels coupled, four feet and six inches (4 ft. 6 in.) in diameter, with a four-wheeled bogie frame in front; these engines are quite capable of high speed, and have fair hauling power, but owing to their weight are entirely unsuited to the permanent way.

There is not less than a weight of four and a half ($4\frac{1}{2}$) tons on each of the driving wheels. According to all recognised rules the maximum weight to be used on a forty-pounds (40 lbs.) rail should not exceed three and a third ($3\frac{1}{3}$) tons per wheel.

The other locomotives are still heavier, some of them weighing thirty-three (33) tons each, and have a weight of five (5) tons or more on each wheel. These engines would require a rail weighing not less than sixty pounds (60 lbs.) to the yard.

All the engines sent out were those known as tank engines,—none of them are provided with tenders.

It has been found necessary to remove the tanks in order to take some of the weight off the wheels, and tenders must be provided in lieu of tanks before the engines can be worked in ordinary traffic.

The carriages are of very light construction, the framing being especially so,—they are hung upon volute springs, which are only a very indifferent substitute for the usual plate springs.

These carriages have a rigid wheel base of ten feet and six inches (10 feet 6 inches) in length, and they are altogether unsuited to the requirements of the line, as from their extreme lightness they would be unsafe to use except at a very moderate speed, and their slender construction is not calculated to withstand the wear and tear of ordinary traffic.

Stations.

Many of the station buildings are now in progress of construction.

The passenger accommodation being provided at Hobart Town, and several of the intermediate stations, may be sufficient for the probable traffic, but the accommodation for goods is exceedingly limited, and altogether insufficient for a traffic which would pay working expenses.

The offices, engine-shed, and workshops at Hobart Town are built of stone, all the other station buildings are of timber; the use of this material is permitted in the Contract. The wooden buildings, however, are far from being substantial.

The goods shed at the Hobart Town terminus is about two-thirds the size of that at the Launceston terminus of the Western Railway; and the latter shed is, I am informed by Mr. Lord, the Manager of the Railway, hardly large enough for the traffic at the terminus of the Line, which is only forty-five (45) miles in length.

The outside platforms are not completed either at Hobart Town or the intermediate stations.

Cost and Value of Works.

With respect to your enquiry as to the probable cost of the Railway I have to remark, that, in estimating the cost of the construction at five hundred and forty thousand pounds (£540,000) —or at the rate of four thousand five hundred pounds (£4500) per mile—between Hobart Town and Evandale, I anticipated that the expenditure on rolling-stock would have been greater than it has been, and that the station accommodation would have been of a more extensive and substantial character than that now being provided; I am, therefore, of opinion that the amount stated in my Report of April, 1874, is in excess of the actual cost of the works, and that such a line as the Company has constructed would have been completed by local contract considerably within the amount of my estimate.

As instancing the excessive value put by the Main Line Company upon some of the materials, I would ask your attention to the statement, No. 54, at page 36 of the Correspondence, (No. 29), House of Assembly, 1875, wherein the cost of the rails, with necessary fastenings, is stated at twenty pounds (£20) per ton. The cost of light permanent materials imported by the Victorian Government, and purchased when the English iron market was at its highest, did not exceed fourteen pounds and ten shillings (£14 10*s.*) landed at Melbourne.

In the same statement the price of seven (7) locomotives is given at four thousand pounds (£4000) each, or twenty-eight thousand pounds (£28,000). The price of such imported engines, complete and in running order, at Melbourne, would be two at two thousand two hundred pounds (£2200), and five at three thousand one hundred pounds (£3100) each, or say twenty thousand pounds (£20,000).

Forty (40) permanent trucks are stated to have cost two hundred pounds (£200) each, or eight thousand pounds (£8000). They can be made in Melbourne for less than half that sum.

If the cost of all the Company's works is in proportion to those items, it is not surprising that the whole of the guaranteed capital has been expended.

Inspection by Board of Professional Officers.

The Contract provides that the "Railway, together with all stations, rolling stock, &c. shall be constructed of the best materials and in a thoroughly substantial manner." I regret to have to record my opinion that in the most essential particulars this provision has been disregarded; and I beg to advise that at the time fixed for the completion of the Contract, or so soon after as the line may be ready to be opened for traffic, the Government should appoint a Board or Commission of two or three professional men of the highest standing, and of experience in the construction and working of railways and rolling stock, and who have not hitherto been consulted upon the subject of the Main Line, to inspect the Railway and to enquire and report to the Government upon the whole subject. The advice of such a Board or Commission would doubtless be of good value to the Government, and would fortify them in any position which they might consider necessary to take up.

Contract Speed.

Referring to your enquiry as to the possibility of the contract speed being maintained, having a due regard to the safety of passengers, I am decidedly of opinion that an average speed of twenty-three (23) miles an hour, including stoppages, cannot be maintained, and that to attempt it with an ordinary passenger train would be a hazardous experiment which I hardly think any responsible officer of the Company would undertake.

It might be possible for one of the express engines without a load, or perhaps with one or two passenger carriages attached, to run through from Launceston to Hobart Town (133 miles) in five and three quarter hours ($5\frac{3}{4}$ hours), stopping only where necessary for the purpose of taking fuel and water for the engine; but I very much doubt if even this could be accomplished,—it certainly could not be carried out from day to day for any length of time.

I believe that if a higher average than fifteen (15) miles an hour is adopted and continued for the passenger trains, the rolling stock must be altered and renewed, and a great portion of the line re-ballasted within a few months from the opening.

Time of Completion.

With respect to your enquiry as to the probable time of completion of the railway works between Hobart Town and Launceston, I may state that there is a gap of about twenty-five (25) miles in the plate-laying, between Lake Tiberias, forty-nine (49) miles, and Tunbridge, seventy-four (74) miles, from Hobart Town.

Mr. Grant informs me that the sleepers for this district are now provided, and that the rails and fastenings are at Hobart Town: this being the case, there would be no difficulty in laying the whole of the permanent way between Hobart Town and Launceston by the end of the year; many, however, of the station works, including those at Launceston station, remain to be done. I am therefore of opinion that the line cannot be ready for opening throughout before February or March next.

I have the honor to be,
Sir,
Your obedient Servant,
W. H. GREENE.

The Hon. T. D. CHAPMAN, *M.L.C.*,
Colonial Secretary, Tasmania.

JAMES BARNARD,
GOVERNMENT PRINTER, TASMANIA.

MAIN LINE RAILWAY.

Further Correspondence in continuation of Paper H.A., No. 60.

Tasmanian Main Line Railway Company, Limited, Engineer's Office, Hobart Town, Tasmania, 18th August, 1875.

SIR,

I HAVE the honor to address you in reply to the observations made by Mr. Greene in his Report to you on the Main Line Railway, dated the 12th instant.

Mr. Greene mostly repeats, in his present Report, the observations made on the 9th April, 1874, and which I fully replied to at the time. In following him upon this occasion, I will, for the sake of brevity, omit any reference to the matters with which no distinct faults are found.

I cannot at all understand the tone of the document, as it differs so greatly from his remarks made in lengthened conversations. It however clearly appears, that he considers himself specially retained by the Government to find every possible fault with the Railway; and make the very most of each ground of complaint, however trivial. Many of the matters specified are mere differences of professional opinion; and others are incorrectly stated, as I will proceed to point out, in the order he adopts:—

Earthworks.

The two slips in the slopes are only such as must occur on every Railway; but I doubt if the slips have ever before been so unimportant on any Railway of equal length as on this, and certainly not on any Railway I am acquainted with.

Bridges.

Mr. Greene frequently informed me that the Main Line Bridges were very much stronger than any of those on the new broad-gauge lines in Victoria, although intended to carry a much less load; and often hinted that they were of unnecessary strength. They are all many times stronger than the Bridges on the Launceston and Western Railway.

I wish Mr. Greene had particularised the one or two he considers not substantial, because I am not aware of any such; while he must know that nothing but exteriorly rough work could possibly result when native timber is used.

It is only the south-west wing of the abutment at the Hunting Ground Creek that shows a few slight signs of settlement, such as is common to all masonry. It would be monstrously absurd to touch it, unless more unfavourable indications occur. This ordinary and very trivial peculiarity was certainly not worth remarking on.

As regards the permanent way being carried over some of the bridges on sleepers fastened to the longitudinal stringers, Mr. Greene might have stated that it is the almost invariable practice to place the rails direct on the stringers, as is done on the Launceston and Western Railway, and some of the new Victorian lines, and is much more objectionable. The platform, with ballast under the sleepers, which I have adopted in many of the bridges, is quite an innovation on established practice; and therefore I am glad that it has his approval.

Culverts.

Mr. Greene states that the majority of the culverts north of the Flat Top Hill can neither be regarded as sound nor substantial. On this point I join issue with him, and challenge him to show *even one* culvert that is not *perfectly sound;* while as regards their substantiality that would appear to be sufficiently proved by their withstanding more than two years use, without showing even the slightest sign of failure or insufficiency,—although during this time they have been exposed to heavy storms, and far more running over by trains (and those of a heavier character) than they will hereafter be required to sustain.

I make no claim that the stones used in the floors of these small culverts should be called "inverts:" it would be sufficient for most engineers that they be properly "pitched," in doing which I have never known the roughness of the stone objected to, if the length is sufficient to reach across the culvert, and under the side walls. The masonry is of the same character as, and at least equal to, that used on the Launceston and Western Railway; and on nearly all other railways, and roads; being rubble masonry, mostly set in mortar, and of the best stone procurable.

A few culverts that were only partially finished at the time of Mr. Greene's first visit, and were condemned by me, have been satisfactorily rebuilt; and there is not at this time, to my knowledge, one imperfect culvert throughout the line.

Fencing.

The fencing made of one rail and five iron wires is exactly that used on all the new lines in Victoria, and on some of the trunk lines, while the gauge of the wire is, I believe, precisely the same.

Ballast.

On this subject I have already mentioned that Mr. Greene has a monomania, which is fortunately not shared in by most of his profession, or the length of railways annually constructed throughout the world would be enormously reduced. He considers nothing satisfactory but broken bluestone of the hardest possible character; and informed me that in Victoria it had cost from 15*s.* to 16*s.* per cubic yard, and that 1,500,000 cubic yards had been used in laying and replacing ballast, &c.,—the item of ballast alone costing upwards of £6000 per mile of the double line.

This very costly ballast may be admissible on railways made direct for the Government, and regardless of cost or time of completion, but cannot be thought of for the Main Line, unless in the districts where it is readily procurable.

Even this bluestone is of the same chemical composition as the heavy ballast we use, and its decay is simply a matter of time. While stating most emphatically that we have obtained throughout the Main Line Railway the very best ballast reasonably procurable, and such as would be approved by most engineers, I must assert that if the line were at once re-ballasted, it could only be done in a reasonable time with precisely the same materials.

I have been glad to use coarse sand wherever procurable, because it makes a better travelling road, and must be more durable than even hand-broken bluestone.

In illustration of Mr. Greene's extreme views on this point, I will mention, as in my own experience of the leading railways in England, that the south end of the Great Northern, and part of the Midland, were ballasted with burnt clay from the cuttings; the Main (Victoria) Lines of the London and Brighton, and London, Chatham, and Dover Railways, were ballasted with mere chalk, as was also the Reading branch of the South-eastern, the London and South-western (London end), and the London and North-western (Buckinghamshire), and Midland (portions of branches) Railways were ballasted with fine sand, as is also the railway through Egypt, and many of the Indian and South American (English-made) lines. On many English and foreign lines a dry loam, the slag of furnaces, ashes, &c., or even a dry earth, has been used. In fact every practical engineer simply obtains the best and driest material readily available at the time of construction; and in this respect we have really been most fortunate, since our road-bed must prove drier than part of that of the Launceston and Western line, and the ballast is of full average quality throughout.

In America no ballast is used on the new lines, and I have travelled over thousands of miles of lines there that carry an enormously heavy traffic, but on which there is no pretence of ballast.

It would have been far more satisfactory had Mr. Greene stated that any other ballast than that we use is obtainable, except his favourite blue metal, which neither the time of construction nor its cost allow us for a moment to entertain the use of.

The iron-stone gravel which Mr. Greene condemned in his previous report still forms the best ballast on the line; and the excellent quartz gravel then alluded to as being in abundance, I took a late opportunity of showing him was a mere superficial layer, only about 9 inches thick, and full of roots, which, however, we had obtained and used as far as reasonably possible. That the ballast varies in quality and condition is simply a proof that we have always selected the very best obtainable.

The ballast throughout the line has been laid to a considerably greater depth than that named in the Contract, and the total quantity used will average more than one-third extra. Mr. Greene has probably mistaken the 18 inches as the depth of ballast under the rail, whereas this contract dimension applies only to the *top of the rail* above formation. I do not think there is a part along the line where a greater depth than 18 inches has not been given.

Sleepers.

I read with some amazement Mr. Greene's criticism of the half-round sleepers. Did he, or did any one else, ever hear of such where the sap-wood had been taken off? I have required extra dimensions to allow for the sap-wood, although this is not usual, and the Contract specifically allows these half-round sleepers of smaller size. Mr. Greene is also mistaken in stating that these sleepers are cut out of young wood, since they are mostly old, and excessively hard and dry, stunted peppermint. The best judges of colonial timber assure me that these half-round sleepers will have fully twice the life of the large squared sleepers that are approved.

Permanent Way.

The adzing of the sleepers has all been done to proper templates, and under careful supervision, which pursues the sleepers until imbedded in the ballast.

Mr. Greene objects to the spacing of the sleepers; but this could not be altered in the manner suggested without destroying the character of the fish joint as a "suspended joint," and thus making the road ride very rough, while damaging the ends of the rails. When examining the work on the Launceston and Western Railway we could not find any loose spikes of the Main Line rail, therefore Mr. Greene assumes them to be of the ordinary kind, and 1½ inches shorter than they are. These spikes were, however, specially manufactured, and pass as far into the Launceston and Western Railway sleepers as do the ordinary spikes into any sleeper of the Main Line, and they must, therefore, be amply sufficient.

The suggestion as to the injury that would be done by the Main Line Railway cylindrical wheels to the Launceston and Western rails is a purely theoretical one, as Mr. Greene would have seen had he made a full-sized diagram. I have done so, and it shows that the surface of the Main Line Railway tires, and that of the centre of the Launceston and Western Railway rails, exactly correspond together. This plan is at your service, and will effectually dispose of the suggestion about a fourth rail, which would cause infinitely more cost and inconvenience in every way.

Had the relative weight of the broad-gauge and narrow-gauge stock been considered, no alarm could have been felt for the 72 lbs. rail.

It is really very unfair for Mr. Greene to remark upon the quality of rails that he has not tested in any way, and can therefore know nothing whatever about.

The "I.S.R. rails" I have frequently and most carefully tested, and found to be exceptionally strong iron. These tests are now in my office. Like all strong iron it is subject to lamination, and (as on every line) a defective rail has now and then to be changed. Mr. Greene saw a small collection of those that had been removed, after an enormous amount of running of heavy material and ballast trains had passed over them.

The Contractors were very glad to get "I.S.R.," or any rails whatever, at the time these were sent out, with the approval of the Company. Each rail is most carefully inspected before put in the track, and rejected for the slightest imperfection.

Every damaged rail will be removed and replaced with a sound rail, by or at the expense of the Contractors, before the Line is accepted from them.

Rolling Stock.

Mr. Greene erroneously states that the two small engines first imported have rigid axles, and therefore are not suited to the curvature of the Line; but this is fully provided for by the leading wheels having a lateral motion, or 3-inch play on each side, the axle boxes being fitted with V sides, to return them to a central position when not on a curve.

They most readily traverse curves of five chains radius.

The weight of the larger locomotives is objected to as being too great, but I should much like to know what construction of engine Mr. Greene would adopt to convey the traffic over the Main Line Railway. Heavy as they undoubtedly are, their tractive power is none too large for working the traffic with reasonable economy; and I much doubt if engines with less weight on the driving wheels can ever be advantageously used. It would necessarily be a great advantage to have a heavier rail on the southern end of the line, but this can be adopted when the traffic increases sufficiently to warrant it. The full contract weight of rail has been given.

The formula quoted by Mr. Greene is never regarded as an inflexible rule, but is always varied by Engineers to suit the necessities of the circumstances.

The heavy locomotives alluded to as weighing 33 tons have been reduced to 26 tons (or to the same weight as the express passenger engines) by removing a pair of flangeless wheels and the side

tanks. This alteration has been made because the flangeless wheels did not work satisfactorily, and not because the engines were too heavy at first

These engines, and also the rolling stock, were designed and are vouched for by the most eminent English authorities on such matters, who had been made especially acquainted with all the peculiarities and requirements of the Main Line Railway. They were constructed by makers of vast experience. The rolling stock by the very well-known firms of "The Ashbury Carriage Company, Manchester," and "Brown, Marshall, & Co., Birmingham," who for the last 40 years have been the leading firms as manufacturers of rolling stock, and whose productions have supplied every part of the world.

If any professional authorities could be trusted to supply what rolling stock it required for this railway, it was the special Engineers and manufacturers through whom it came to us; and therefore I am loath to condemn it in the off-hand manner adopted by Mr. Greene. The engines and rolling stock of the Victorian Railways have never been *in any way* under the charge of the Railway Engineering Staff, but under that of the Locomotive Superintendent (Mr. Meikle), who has long been on the line. I had the pleasure of showing the whole stock to Mr. Meikle last summer, and he took trips on the engines and in the carriages, and expressed his approval of all the arrangements. The few suggestions he made we were happy to immediately adopt.

The wheel base of the carriages is 10 feet, and not 10½ feet; while, as regards their lightness preventing their being run except at a moderate speed, many thousands of people have safely travelled in them at a rate exceeding 30 miles per hour on this unfavourable end of the line, without experiencing even the slightest accident. So far as tried at present, the carriages appear eminently satisfactory, and seem to be most popular with travellers.

Stations.

Mr. Greene states that the wooden buildings are far from being substantial, an opinion in which I venture to think very few builders will agree with him. I have often been twitted with their extreme strength; but no one has before suggested their unsubstantiability, nor could they justly do so.

As regards the size of the goods shed at the Hobart Town Terminus, I consider it amply large enough to commence with, since it can be most readily and quickly extended at any time, without interference with the traffic. It is now the size of that first put up at Launceston, but I doubt if it will be as much used. The present Launceston shed was presumed to be large enough to take the whole Main Line Traffic, in addition to that of the Launceston and Western Railway; and it is only within the last month that separate goods sheds have been proposed.

With the ample storage accommodation in Hobart Town, and facilities for removing freight direct from the trucks, shed accommodation is almost unnecessary; and I venture to say that very little use will be made of it, as in the Launceston and Western Railway. Hereafter it may be advisable to build sheds for bonding purposes.

Cost and Value of Works.

Since Mr. Greene has no materials with which to make even an approximate estimate of the cost of the line, his figures cannot be other than a mere rough guess, and it is certainly somewhat wide of the truth.

Taking however Mr. Greene's estimate of £540,000 as the net cost of making the line from Hobart Town to Evandale junction by local petty contracts, and adding thereto the profit and contingencies that the superior contractor (through whom alone a Government or English Public Company would work) would most properly be entitled to; adding also the cost of engineering and management here, and the £25,000 allowed Mr. Coote and others for preliminary expenses, it will be seen that the cost of the line proper considerably exceeds £700,000. When to this is added the £48,750 of discount on debentures, a small allowance for the Company's London expenses, with the preliminary cost of raising the capital, &c., the whole outlay *must be found* to exceed £800,000, between Hobart Town and Evandale, on *Mr. Greene's own estimate*; and such has been truly the case, the excess over this sum being of a *most important* character.

That these expenses were inevitable in obtaining the line through the medium of a public company on the prescribed terms must have been known to, and concurred in, by the Government from the first.

As regards the statement (No. 54, page 36, Main Line Correspondence, 1875,) that Mr. Greene most unfairly selects and comments on, although perfectly well aware from the context that it was merely a rough guess of Mr. Coote's, who had no practical knowledge on the matter, and only exhibited the estimate during a conversation with the Colonial Treasurer—not handing it in as an official document—I cannot see anything very wrong. The rails alone were purchased at £12 10*s*.

to twelve guineas per ton, the market quotation then reaching to £13, as may be seen by referring to circulars at that date. By these it will also be noticed that rails of any kind, at even the very highest price, were then practically unobtainable; adding thereto the extra proportional prices of the fish-plates, bolts, and spikes, which reached £26 per ton, and the cost of local carriage, freight, insurance, shipping charges, transhipments, &c., &c., I do not think the estimate was a false one, especially if a small contractor's profit be allowed.

Mr. Greene's price of £14 10*s*. refers to *rails* only, doubtless coming direct from the manufacturers, and at very much lower freight than to Tasmanian ports.

For the above reasons the price of £4000 for each locomotive corresponds with Mr. Greene's estimate, and any error in the rough assumption of the cost of the trucks is of a most trivial total amount. The document is not, and was never intended to be of any authority in the Contract; and Mr. Coote remarks thereon in an official letter written three days after its date (No. 59, 19th June, 1874)—

"With regard to this memo. I have to request that you will not assume it to represent the actual cost of the items or the details of the London expenditure, as this I have no means of giving, but simply know the articles shipped. It is certain that the Company for their own protection would not under any circumstances pay the Contractors more than was due to them by the strict terms of the Contract, and the general custom in such matters."

Inspection by Board of Professional Officers.

With Mr. Greene I regret that he considers any of the essential provisions of the Contract disregarded, but feel satisfied that if he viewed the progress made, with the consideration induced by a more varied experience, especially that of an engineer accustomed to "light" or foreign railways, or to work done on a contract where the resources are limited, he would find far more to praise than to criticise, and would allow that every reasonable condition had been amply and properly fulfilled, although this loyalty to the work involved the Contractors in a large and most serious loss.

Contract Speed.

Although not an advocate for the excessively high speed of the express trains named in the Contract,—on account of the extremely injurious effect it must have upon the traffic receipts from local sources, and because it must deprive the inhabitants of the country districts of that reasonable accommodation, and development of their resources, which they have been led to expect,—I have no hesitation in stating that the condition can be exactly complied with, notwithstanding Mr. Greene's doubt on the matter.

Since this contract condition of speed is so much in question, I trust that the circumstances under which the Government inserted it into the Contract will be fully and freely explained, as is only just and honest.

Was it done under professional advice? Was any engineer consulted as to its practicability on the Main Line Railway? Or was it the mere caprice of some one who had no practical knowledge either of the construction or working of railways? The extreme working speed on the Queensland Railways is 14¾ miles per hour; of the Norwegian Railways (Hamar, Elvernin, and Rena, and the Throndjheim and Storen), 12 miles per hour; of the Belgian (Antwerp to Ghent) and French (Monthicon to Gamat) Railways, about the same; of the Prince Edward Island Railway, the Toronto and Nipissing, and the Toronto, Grey, and Bruce, (which all pass over an unusually easy country), 16 miles per hour, *express;* and all these lines are about the same gauge as the Main Line. The United States narrow-gauge Railways of the States of Utah and Colorado do not attain quite 14 miles per hour, and the long metre-gauge lines of India are restricted by the Government regulations to the very low speed of, I believe, 10 miles per hour, as is also the line from Arcounm to Congeveran of 3 ft. 6 in. gauge.

I cannot find that there is any narrow-gauge line in the world, however expensively constructed, (and many have cost upwards of £10,000 per mile, or made in countries which offer no physical obstructions whatever to the passage of railways, and in this respect differ so much from Tasmania) in which the working speed exceeds sixteen miles per hour including stoppages.

Even on the standard gauge lines of New South Wales, and throughout the vast railway system of Canada and the United States, the express speed of trains is but 20 miles per hour. In Victoria it is true that on the *Main* Line, of 5ft. 3in. gauge, the express trains average over 24 miles per hour, but Mr. Greene assures me that this involves the running at from 50 to 60 miles per hour between stations.

I do not mention these details with any desire to seek an alteration of the contract speed, but simply to show the conclusions that practical men have arrived at in other countries.

The original time tables from which these particulars are quoted are in my possession, and entirely at your service.

Since Mr. Greene virtually certifies that the present railway, with its rolling stock and appliances, is safe and sufficient for an average speed of fifteen miles per hour, it would appear that he considers it equal in character to any of its more costly prototypes of the narrow-gauge, and his adherents can feel little doubt as to the utility of the line.

Comparatively few are interested in the single light express trains; because three-fourths of the whole railway business must necessarily be done by the local, or the heavy, frequently stopping, freight trains, of which the contract speed need not exceed ten (10) miles per hour.

I have already stated that the rolling stock has been found, by the unerring test of practical experience, to run safely at any speed required for the due fulfilment of the Contract.

Why the line should require re-ballasting within a few months on account of a little extra speed of the trains, I am totally at a loss to understand, because many circumstances affect the ballast in a much greater degree than the speed.

Time of Completion.

Mr. Greene concurs in my opinion that the Railway can be completed before the earliest date named in the Contract for its final opening for traffic.

With the exception of 18 miles of permanent way it is now prepared for public use. I anticipate that the rails will be continuous throughout in October.

I cannot but think that much trouble and public anxiety would be avoided by the Government realizing the consideration that the line was not—as they seem to imagine—being constructed for them, and at their sole cost; but rather, that British capitalists had provided the whole of the necessary funds, and were having the line made, for their account and risk, to be owned by them in perpetuity; and therefore they may be trusted to look after their own interests, which are simply to obtain the best possible line that their resources will provide.

The interest of the Colony—as I regard it—is virtually the same as that of the Company; but the former have the satisfaction of reflecting that—through peculiar circumstances—they have secured the best railway bargain that has probably ever been made, and are only liable for a contingent guarantee (at a low rate of interest) on a very much less sum than the cost of the line, while they have secured all the benefits that the Railway must afford.

I have the honor to be,
Sir,
Your most obedient Servant,

CHARLES H. GRANT.

Hon. T. D. CHAPMAN, *M.L.C., Colonial Secretary.*

Tasmanian Main Line Railway Company, Limited, Engineer's Office,
Hobart Town, Tasmania, 23rd August, 1875.

SIR,

SINCE I had the honor to send you my reply to the Report of Mr. Greene on the Main Line Railway, it has occurred to me that, on the much vexed question of speed, I only quoted the rate of running, including stoppages, of railways (from time tables in my possession) made to a similar gauge with the Main Line, and omitted to supplement this information by giving the opinion of eminent Engineers on the capabilities in this respect of narrow-gauge Railways.

Much valuable information thereon will be found in Mr. S. V. Kemp's report to the Government on the Main Line Railway, (Parliamentary Paper, No. 90, 1874,) in which a very long extract is taken from a report made by my friend Mr. J. E. Boyd, (now constructing the Prince Edward Island Railway on the 3½ feet gauge), who has always been strongly opposed to running at high speeds, and limits that on his last constructed Railway to 12 miles per hour. Mr. Kemp fixes the maximum speed of the Main Line at 18 to 20 miles per hour, including stoppages; and I think that the Government must have overlooked this important recommendation, when, with the report in their hands, they doubled the speed.

Mr. Carl Pihl, the Engineer of the narrow gauge Norwegian Railways, states that on his lines the trains run 14 miles per hour, including stoppages; but the latest time tables show that the speed is only 12 miles per hour.

Mr. Higinbotham fixes 15 miles per hour as the highest running speed for the narrow gauge; and this speed was adopted by Mr. Major for the Geraldton and Northampton Line, in Western Australia, but Mr. W. T. Doyne allowed only 10 to 12 miles.

By an Act of the South Australian Parliament, 31 Vict. No. 22, clause 6, the speed of the passenger trains for the Port Augusta and Trans-Continental Line was determined at not less than 10 miles an hour, including stoppages, for the whole length of the line, and the gauge is fixed at 3½ feet.

In the Report of the Royal Commission on Railway Construction in Queensland, 1872, it will be seen that the Commissioners paid especial attention to the question of a suitable speed for narrow (3½ feet) gauge Railways; and—after quoting the opinions of nine (9) different engineers and contractors, (all different authorities to those I have before alluded to), of whom seven fixed from 8 to 15 miles per hour as the range of maximum speed, one allowed 16 miles, and the ninth (who was a too enthusiastic narrow-gauge advocate) estimated from 12 to 25 miles per hour—they recommended that the lines should be worked "with a limited speed."

It should be remembered that all these opinions are based—as will be seen in Mr. Kemp's report—on Railways constructed in *the very best possible manner, quite regardless of the cost;* which has varied to as much as £11,000 per mile in net cash. Mr. Kemp estimated the cost of the Main Line Railway, made as "a good, useful, lightly constructed line," at £6310 per mile in net cash.

There are many other examples of narrow-gauge lines, running at very much lower speeds than that of the Contract; amongst others, the Glasgow and Cape Breton Railway of Nova Scotia, the Railways in Chili, the Wellington, Grey, and Bruce Railway, and the New Zealand lines recently opened, (all 3½ feet gauge); but of these I am not at present able to furnish the exact particulars, as is given of those above mentioned.

As I cannot find an example of the high contract speed having been practically obtained upon even one Railway, (however costly in construction, and working under extremely favourable conditions in regard to high speed, as some are,) and as the opinion of every practical man (with one exception) is entirely opposed to such a rate of speed under any circumstances, I trust you will pardon my great anxiety to ascertain the conditions under which it was imported into the Contract.

I find that the narrow-gauge lines of India, as also the celebrated Festiniog Railway, are absolutely restricted by the Government to a speed of 12 miles per hour.

I have, &c.,
(Signed) CHARLES H. GRANT.

The Hon. the Colonial Secretary.

Tasmania,
Colonial Secretary's Office, 26th August, 1875.

SIR,

I HAVE the honor to acknowledge the receipt of your letter of the 12th instant, containing your Report on the Main Line Railway between Hobart Town and Launceston, for which I have to thank you.

Mr. Grant, the Engineer-in-Chief of the Main Line Railway, has addressed me two letters, under date the 18th and 23rd instant, commenting on your Report, copies of which I forward herewith; and I shall feel obliged by your favouring me with any observations you may desire to make thereon, if possible, by return steamer.

I have, &c.,
(Signed) THOS. D. CHAPMAN.

W. H. GREENE, *Esquire, Railway Department,*
Kyneton, Victoria.

Kyneton, Victoria, 4th September, 1875.

SIR,

I HAVE the honor to acknowledge the receipt of your letter of the 26th ultimo, enclosing copies of two letters addressed to you by Mr. Grant, Chief Engineer of the Tasmanian Main Line Railway, commenting upon the Report which I addressed to you on the 12th ultimo, and you invite any observations which I may desire to make upon Mr. Grant's letters.

I do not consider that any good purpose would be served by following Mr. Grant's remarks *seriatim*, as many of them refer to technical details which cannot be appreciated by unprofessional persons. Some of them are simple denials, and a few are personal innuendoes, which I will not

further notice beyond saying that they are unjustifiable and utterly groundless. I may say, however, that my opinions are not in the least shaken by Mr. Grant's replies, many of which, relating to matters of fact, could be very summarily disposed of.

The broad questions at issue seem to be,—

1. The character of the works.
2. The cost of them.
3. The probability of maintaining the Contract speed with safety.

Upon these points I believe the opinion of a Board of Engineers, as I suggested, would be most valuable.

I cannot gather from Mr. Grant's letters whether he approves of the suggestion. I may presume, however, that as he is firm in his opinions he would rather encourage investigation.

Character of the Works.

As to the character of the works, it is unnecessary for me to repeat in detail what I have already said of it. I will only refer to the permanent way, which is almost the principal item in Railway construction: the cost of maintenance and the working expenses depend in a great measure upon its character, and the quality of its materials.

Platelaying.

I believe the platelaying, sleepers, ballast, and rails of the permanent way of the Main Line to be seriously defective.

The rails are not properly seated upon the sleepers; the line is not accurately or uniformly gauged; and the sleepers are so spaced that the weakness of the joints is very apparent.

Half-round sleepers are intermixed with square sleepers,—consequently there can be no uniformity of strength, or elasticity in the road. A rail has a bearing upon a square sleeper of eight inches, and upon the half-round sleeper adjoining it has a bearing of only three or four inches. When a joint occurs between a square and a half-round sleeper the fish-plates and bolts are subject to an undue strain, which soon makes itself felt.

Sleepers.

The half-round sleepers are *not* cut from old stunted trees, but from young saplings. They are adzed irregularly, and not sufficiently to remove the sap-wood from underneath the rails,—consequently the rail will work in its seat as soon as the sap-wood decays.

Ballast.

I do not know upon what grounds Mr. Grant states that I have a bias in favour of bluestone ballast: I have not said so. I much prefer good gravel, which is chiefly used on the Victorian lines,—the best substitute for it being good sound broken stone, which is used where gravel is not obtainable.

The material lying on the formation of the Main Line between Oatlands and Tunbridge is not ballast: it may, and doubtless will, be covered over with ballast, as similar material used in lieu of ballast on the northern section has already been covered up.

In those places where the Line has been ballasted to rail level there is not the Contract quantity (18 inches) below the top of the rail.

Miles of the Hobart Town section of the line have been ballasted with material taken from a depôt near New Town. A large proportion of this contains marly clay, which retains moisture, and after wet weather the sleepers work loose in it; but this material, though only very indifferent, is less objectionable than much of that used for bottom ballast on the middle and northern sections of the line.

Rails.

I may observe that I did not, as Mr. Grant assumes, estimate the quality of the rails, or extent of their premature wear, from a small stack of broken rails lying near one of the stations, but from observation of a large number of rails in the Line which were partially worn, and some that have been already taken out south of Brighton and north of Campbell Town.

It appeared to me that the larger portion of the damaged rails were of the Indian State Railway brand; and I am, therefore, led to believe that the wear of these rails is due rather to their indifferent quality than to the amount of traffic over them.

The circumstance that the rails upon the terminal sections of a line 120 miles in length are seriously affected by the traffic necessary to complete the middle section of it, will probably strike many persons as singular.

Cost of the Works.

My estimate of the value of the Railway Works is objected to, and stated to be unreliable, inasmuch as there were no materials for making it.

The section furnished by the Company to the Government in December, 1873, and the Schedule of the bridges, &c., supplied the means of ascertaining approximately the quantities; the prices were taken from existing Contracts for works in Victoria, very superior in character to any on the Main Line.

Labour in Victoria is at least ten per cent. higher than in Tasmania; and imported building materials, large quantities of which are used in the Railway works, are subject to a heavy Customs duty, and wharfage rates.

As a check upon my previous estimate, it may be useful to compare the cost of some of the light lines in Victoria with the estimated cost of works on the Tasmanian Main Line Railway.

The average cost of construction of one hundred and thirty-two miles (132 miles) of light lines which have been opened for traffic has been Two thousand seven hundred and fifteen Pounds (£2715) per mile, exclusive of stations, rolling-stock, rails, and fastenings, purchase of land, and engineering expenses.

I have selected the lines on which the works are much heavier than those on the Tasmanian Main Line.

The gauge is 5 feet 3 inches; alternative tenders for this and the 3 feet 6 inches gauge were obtained for a portion of these lines with a view of determining the difference in cost between the broad and narrow gauge. This difference averaged Two hundred and sixty Pounds (£260) per mile.

If they had been constructed on a 3 feet 6 inch gauge, the cost would, therefore, not have exceeded Two thousand four hundred and fifty-five Pounds (£2455) per mile, exclusive of the items mentioned above, which would be the same for either gauge. The estimate of the cost of the Main Line between Hobart Town and Evandale will be as follows:—

	£	*Total Amount.*
(*a*) Construction	2455 per Mile × 123 miles	£301,965
(*b*) Rolling-stock.....	410 ditto, ditto	50,430
(*c*) Stations	100 ditto, ditto	12,300
(*d*) Engineering	280 ditto, ditto	34,440
(*e*) Purchase of land	300 ditto, ditto	36,900
(*f*) Rails and fastenings	932 ditto, ditto.....	114,636
TOTAL.....	£4477	£550,671

(*a*) With the permission of the Honorable the Commissioner of Railways, I transmit specifications and lithographed drawings of the works on the light lines. It will be seen that the materials and workmanship are minutely and carefully described, and are of the highest class,—

Some of the large river bridges being of ashlar masonry and iron; the culverts of brickwork in cement and mortar, with stone or cement copings.

All the piles used in bridges and two-thirds of the sleepers being of the best quality of red gum or ironbark timber.

(*b*) The estimate of the rolling-stock is arrived at from Mr. Grant's list, priced out at extreme rates.

(*c*) The estimated cost of the buildings at Hobart Town is included in the sum of Twelve thousand three hundred Pounds (£12,300).

(*d*) This is above the average on the Victorian Lines, including cost of clerical staff.

(*e*) This is about the average rate paid in Victoria, including all compensation and the purchase of many valuable town and house properties: it represents a rate of, at least, thirty pounds (£30) per acre for all land occupied by the Tasmanian Main Line Railway, including the Government Reserves, which the Company do not pay for. As I have no means of ascertaining the actual cost, I have taken care to give extreme rates.

(f) The rails and fastenings are priced at the highest rates paid by the Victorian Government during the last four years, including freights and all other charges.

Contract Speed.

My opinion as to the impossibility of maintaining the Contract speed is founded upon many years experience and observation of the working of traffic over lines of various capacities and under a variety of conditions.

There are at least 35 miles of the Main Line on which it would be dangerous, if not impossible, to run at a speed exceeding fifteen miles an hour.

Any train which would go through from Hobart Town to Launceston at the average rate of twenty-three miles an hour, including stoppages, must run for 98 miles of the distance at a speed exceeding forty miles an hour,—and neither the line nor the rolling-stock is capable of this.

In the above calculation the time necessarily lost in stopping, standing, and starting at four intermediate stations, for engine purposes, is taken into account.

I am not surprised at the extreme anxiety shown by Mr. Grant that the condition of speed should be waived by one of the contracting parties, as it is almost the only precise condition in the Contract: the true interpretation of the general clauses relating to the character and quality of the materials and works will be debateable until the cost of maintenance and renewals make it too apparent that the line with its equipment is not substantial within the meaning of the Contract; but the maximum speed attainable, or rather unattainable, from day to day will be shortly demonstrable.

Mr. Grant is careful to show that his anxiety for a slower speed does not proceed from any doubt on his part that the line or rolling stock is capable of maintaining the Contract speed, but that it is due to his desire to see the public better accommodated. One daily fast train, however, from each terminus will not interfere with running slow trains, which Mr. Grant believes will serve the public so much better. There is nothing in the Contract to prevent the Company running as many ten miles an hour trains as will be necessary for public convenience.

I think, however, that the public, who have contributed by taxation to provide the interest on what I believe to be the whole amount expended upon the Railway, will surely expect some better means of passenger transit than is already afforded by the punctual and well-appointed coach service on the road from Hobart Town to Launceston.

A ten mile an hour speed may be expected from any tramway, and if the Tasmanian Main Line Railway is capable of no higher, its title will be pretentious and inappropriate.

I have, &c.,

(Signed) W. H. GREENE.

The Hon. the Colonial Secretary.

P.S.—I regret that I did not receive your letter in time to reply by the return steamer.

W. H. G.

JAMES BARNARD,
GOVERNMENT PRINTER, TASMANIA.