No. 315. Read the following letter from Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Madras, 10th November 1874, No. 688 :—

ADVERTING to paragraph 4 of the letter from the Government of India, under date the 16th August 1873, No. 1,447 G. R., I have the honor to state that shipments of Australian coal have lately been received by both of the Railway Companies in this Presidency, and that trials have also been made of Bengal coal. In the matter of cost, the comparison between these coals and the last received English coal is as follows :—

Vide Proceedings, Madras Government, 25th September 1873, No. 2,368.

Coal.	Madras Railway cost per ton as received into Store at Madras.	South Indian Railway cost per ton as received into Store at Negapatam.
	Rs. A. P.	Rs. A. P.
Australian	27 13 1	25 12 0
Indian	21 8 0	19 0 0
English	31 11 5	30 6 0

The Australian coal was in both cases shipped at Newcastle, New South Wales. The supply received by the Madras Railway is what is known as "Best Waratah" coal. The Indian coal was in both cases obtained from the Raneegunge collieries, and is known as "Sanktoria" coal.

2. With reference to this subject, I beg to enclose letters* from the Agents of the two Companies, giving the interesting results of trials which have been lately made with a view to determine the comparative value for locomotive purposes of the three descriptions of coal. These results, which may be summarized as follows, will be seen to agree in a remarkable manner :—

* From Agent, Madras Railway, No. 919, 14th October 1874.
From Agent, South Indian Railway, No. 100, 15th September 1874.

Coal.	Madras Railway.		South Indian Railway.	
	Average consumption per mile.	Cost per mile run.	Average consumption per mile.	Cost per mile run.
	lbs.	A. P.	lbs.	A. P.
Australian	27·35	5 5·21	31·45	5 9·41
Indian	31·08	4 9·28	32·32	4 4·64
English	31·23	7 0·89	35·72	7 9

placing English coal decidedly at the bottom of the list, even as regards the locomotive value of the coal per lb., irrespective of its cost. The result of the experiments have exhibited the Indian coal in an unexpectedly favorable light, and I understand from the Agent of the Madras Railway Company that he has received an offer to supply coal of the same description and quality as that

experimented with, at a rate of Rupees 18-4-0 per ton delivered in store at Madras. This would reduce the locomotive fuel expenses to 4 annas per mile run, being about half the cost of English coal, and about two-thirds that of Australian coal.

From R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company, to Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E, Consulting Engineer for Railways, dated Madras, 14th October 1874, No. 919.

WITH reference to previous correspondence, and in continuation of my letter of the 24th of July last, No. 647, I have the honor to enclose herewith, for submission to Government, a copy of the Acting Locomotive Superintendent's report* upon the trials he has recently made in view to determine the comparative merits, as locomotive fuel, of English, Australian, and Indian coal. I also enclose copies of the two statements referred to in the report.

* No 372, 8th October 1874.

2. The results shown by the trials are favorable to the Australian and Indian coals, especially the latter, and I propose to suggest to my Board the policy of making arrangements for shipping smaller quantities of English coal in order to admit of our making larger purchases of fuel that is shown to be so much more economical in working.

3. The price we are at present paying for Indian coal is Rupees 21-8-0 per ton delivered in our yard, but I have reason to believe that a considerable reduction in this rate would be effected were there greater facilities for obtaining freight for coal from Calcutta to Madras.

From E. C. BOODLE, Esq., Acting Locomotive Superintendent, to R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company, dated Perambore Works, 8th October 1874, No. 372.

REFERRING to the correspondence noted in the margin, I beg to report, for your information, the result of the several trials which have been made with Indian and Australian coals, as compared with the coal received from England.

Indian Coal.
To Agent and Manager, No 81, 6th Feb. 1874.
From ,, ,, 2,029, 3rd July ,,
To ,, ,, 261, 17th ,, ,,
From Consulting Engr. ,, 811, 28th Aug. ,,

Australian Coal.
From Board, No. 503, 17th Jan. 1873, para. 4.
From Agent and Manager, ,, 595, 19th Feb. ,,
From Board ,, 521, 5th Dec. 1873, paras. 5 and 6.
From Agent and Manager, ,, 103, 10th Jan 1874.
From ,, ,, 1,036, 1st April ,,
From ,, ,, 1,697, 23th May ,,

2. The first trials were made during the months of April, May, and June, when Patent Fuel, Australian coal, and Hastings Hartley coal were used, respectively, with three engines of the same class, and doing similar work; each description of coal being used by each engine in rotation for the space of one month. In the month of June trials were likewise made of the Indian coal received ex ship *Olive Branch*.

3. The results of these experiments were favorable to the Australian and Indian coal, but as the engines, which had been burning the latter description of fuel, had been working trains of a different class, and had consequently run at as lower rate of speed than those in which the English fuel had been used, I considered it desirable, before forwarding my report on the subject, to make a further trial, and thus ensure the results arrived at being as reliable as possible.

4. I therefore arranged for the coal mentioned below to be burnt exclusively in five engines of a similar class, and as nearly as possible in the same state of repair :—

Indian Coal, ex *Olive Branch*,	priced at	Rupees	21-8-0 including all charges.
Australian Coal, ex *Bengal*,	,,	,,	27-13-1 do.
Cowpen Hartley Coal, ex *Orion*,	,,	,,	32-6-4 do.
Do. ex *Ella*,	,,	,,	32-6-4 do.
Hastings Hartley ex *Lena*,	,,	,,	30-5-8 do.

5. The engines selected were numbered 70, 71, 72, 61, and 68, and the experiments lasted for five weeks; the engines burning in turn, for the space of one week, each of the descriptions of coal mentioned.

6. It was also arranged that these engines should be employed alternately on trains of a similar description, and running at the same rate of speed, the circumstances therefore under which the various tests were made were as identical as it was possible for them to be. There is, of course, always a chance of increased or decreased consumption of fuel according to the state of the weather, wind, etc., but, as the trials extended over so long a period as five weeks, I think that, in that time, the quality of each coal would be very fairly tried, and that the results which I have shown in the enclosed statements may therefore be accepted as conclusive.

7. The statement accompanying this, marked A, exhibits the weekly working of each of the five engines employed. The mileage run is the same in each case, and it will be observed that the variation in the result of the weekly working, as regards the consumption of each description of coal, is very slight, having regard also to the variation in the respective loads.

8. Statement B is an abstract of Statement A, and exhibits the results of the working of the whole of the five engines with the respective descriptions of coal. In it is also shown the cost per mile and the relative percentage of the cost of the fuel consumed. The comparison points evidently in favor of the Indian and Australian coals, the cost of which stands respectively as Annas 4 Pies 9·28 and Annas 5 Pies 5·21 per mile, against Annas 6 Pies 11·75, Annas 7 Pies 1·28 and Annas 7 Pies 1·42, the price of the English coal. The consumption per mile of the Indian coal is 31·08 lbs., and of the Australian coal 27·35 lbs., while that of the English coal is from 30·16 lbs. to 32·83 lbs.

9. The Australian coal is of very good quality, steaming well, and making very little clinker or ash.

10. The Indian coal also steams well; but from the large quantity of ash formed, the fire box and ash-pan have frequently to be cleaned out on the journey. This has been, however, to a great extent remedied by a special arrangement of the fire bars. The clinker is very small, and easily removed.

11. Taking into consideration the results which I have stated, and the general condition of the Indian and Australian coal which has been received, I think that further purchases of these two descriptions of fuel may with advantange be made.

A.

MADRAS RAILWAY.

LOCOMOTIVE DEPARTMENT.

Statement exhibiting in detail the Weekly results of the several trials made on Locomotive Engines with Australian, Indian, and English Coal.

DATE.	Number of Engine.	Total miles run.	Quantity of fuel consumed	Average number of vehicles hauled per mile.	Average consumption of fuel per mile.
	Australian Coal, Ex "Bengal."				
			CWT. LBS.		LBS.
1st week	71	737	173 16	14·2	26·31
2nd ,, ...	70	737	161 84	15·4	24·58
3rd ,, ...	61	737	190 56	15·0	28·95
4th ,, ...	64	737	187 56	15 3	28·49
5th ,, ...	68	737	187 0	15·2	28·42
	Indian Coal, Ex "Olive Branch."				
1st week	70	737	182 56	14·4	27·73
2nd ,, ...	72	737	207 84	14·9	31·57
3rd ,, ...	68	737	203 56	15·1	30·94
4th ,, ...	61	737	212 56	15·2	32·29
5th ,, ...	71	737	216 56	15·7	32·90

Date.	Number of Engine.	Total miles run.	Quantity of fuel consumed.	Average number of vehicles hauled per mile.	Average consumption of fuel per mile.
			CWT. LBS.		LBS.
		Cowpen Hartley, Ex "Orion."			
1st week	72	737	208 24	16·3	31·64
2nd ,, ...	61	737	196 84	15·6	29·90
3rd ,, ...	70	737	180 0	14·4	27·35
4th ,, ...	68	737	211 28	15 0	32·10
5th ,, ...	71	737	196 28	15·5	29·82
		Cowpen Hartley, Ex "Ella."			
1st week	61	737	199 28	15 0	30·28
2nd ,, ...	68	737	209 28	14·4	31·80
3rd ,, ...	71	737	202 0	15 9	30·70
4th ,, ...	70	737	188 0	15 1	28·57
5th ,, ...	64	737	212 0	15·4	32 22
		Hastings Hartley, Ex "Lena."			
1st week	68	737	212 0	15·0	32·22
2nd ,, ...	71	737	217 28	16·0	33·01
3rd ,, ...	64	737	220 0	12·9	33·43
4th ,, ...	70	737	205 0	16·8	31 15
5th ,, ...	61	737	226 0	14·8	34·34

B.

LOCOMOTIVE DEPARTMENT.

Statement showing the average results of the several trials with Australian, Indian, and English Coal, exhibiting also the cost per ton, the actual cost per mile, and the relative percentage of the cost per mile of each description of fuel.

Description of Fuel.	Total miles run.	Total consumption of fuel in cwts., lbs.	Average consumption per mile.	Average number of Vehicles hauled per mile.	Cost per ton including landing charges, etc.	Cost per mile run.	Relative percentage of cost per mile.
			lbs.		RS. A. P.	A. P.	
Australian Coal	3,685	899 100	27 25	15·02	27 13 1	5 5·21	17·30
Indian Coal	3,685	1,022 84	31 08	15·06	21 8 0	4 9·28	15·20
Cowpen Hartley, Ex *Orion* ...	3,685	992 52	30·16	15·36	32 6 4	6 11·75	22·22
Do. do. Ex *Ella* ..	3,685	1,010 56	30 71	15·16	32 6 4	7 1·28	22·62
Hastings Hartley Ex *Lena* ...	3,685	1,080 28	32 83	15·10	30 5 8	7 1·42	22·66

8th October 1874.

(Signed) E. C. BOODLE,
Ag. Locomotive Superintendent.

From W. S. BETTS, Esq., Agent of the South Indian Railway, to Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, dated Negapatam, 15th September 1874, No. 100.

I HAVE the pleasure to forward herewith, for your information, copy of a report from this Company's Locomotive Superintendent regarding certain recent comparative trials of English, Australian, and Indian coal, in the working of our trains.

Proceedings of the Madras Government, Public Works Department,
16*th December* 1874.

Letter from the Locomotive Superintendent, to the Agent, dated 2nd September 1874, *No.* 1,344.

I now send you the tabulated result of the English and Australian coal trials with our engines as requested by the Board. I have also incorporated a trial sample of Bengal coal (Raneegunge Sanktoria). I have been thus long obtaining these results, as I wished the tests to be made in each case under circumstances as nearly as possible similar, and also because at the time the Board's wishes were communicated to me, I had no English coal that I could get at to have it unmixed with other coal. In these trials the same driver, engine, and class of train has been employed. You will observe that my former opinions have been fully borne out regarding the superiority of the Australian over English for locomotive purposes. The Sanktoria coal has surprised me much. I can only account for the very favorable result by supposing the coal to be fresher than the other samples, and that the heavy load suited it better. I would suggest a shipment from Calcutta being obtained, say, 700 or 800 tons.

SOUTH INDIAN RAILWAY.

LOCOMOTIVE DEPARTMENT.

Trial of English Coal.

Date.	Engine No.	No. of vehicles.	Miles run.	Gross weight of Train.	Fuel consumed.	Fuel per mile run.	Ash per cent. of fuel used.	Average pressure of steam.	Water consumed in gallons.	Water consumed in lbs.	Water evaporated per lb. of coal.	Average evaporation.	Remarks.
1874.				TONS.	LBS.								
20th June ...	3	16	82	127 16 0 10	2,732	33·31	9·26	88	2,133	21,330	7·80	7·92	Strong wind.
22nd ,, ...	3	16	82	139 4 2 14	3,029	36 93	8·68	88	2,418	24,180	7·98		Do
25th ,, ...	3	16	82	150 3 3 26	3,029	36·93	6·60	88	2,418	24,180	7·98		Fair weather.

Trial of Australian Coal.

1874.													
27th June ...	3	15	82	128 1 0 4	2,138	26·07	12·33	88	2,006¼	20,063	9·38	9·20	Fair weather.
16th Aug ...	2	16	82	148 1 2 20	3,024	36·87	16·40	88	2,727½	27,275	9·02		
25th ,, ...	4	16	82	134 10 0 8	2,576	31·41	11·29	88	2,375	23,750	9·22		

Trial of Indian Coal.

1874.													
18th Aug. ...	2	16	82	166 12 1 10	2,688	32 77	18 86	88	2,848	28,480	10·50	10 28	Fair weather.
20th ,, ...	2	16	82	156 2 3 8	2,576	31·41	17·62	88	2,539	25,390	9·85		
22nd ,, ...	4	16	82	166 19 0 17	2,688	32 77	15·29	88	2,847	28,470	10·50		

N.B.—In each case the trials took place on the same trains between Negapatam and Trichinopoly (material specials) and the same driver was employed.

NEGAPATAM,
1st September 1874.

(Signed) E. G. SHEWARD,
Locomotive Superintendent.

No. 316. ORDER THEREON, 16th December 1874, No. 3,532.

RAILWAY, No. 51.

THE subject of the fuel used on Indian Railways attracted the attention of the Government of India in November* 1872, and they desired to be furnished with information as to whether Indian collieries could not be utilized with advantage; wood, imported English or Australian coal, and patent fuel having hitherto formed the staple of consumption on the railways in this Presidency.

* G. O., No 2,742, dated 21st Nov. 1872.

2. The Consulting Engineer accordingly submitted reports with calculations of the probable cost of getting coal from the Lower Godavery fields by inland water carriage to Madras; and these were duly furnished* to the Government of India, with a suggestion that further information might be obtained from the Government of New South Wales as to the cost and description of Australian coal best suited to locomotive purposes. The Government of India, in reply,* desired that the subject of Australian coal should, in the first instance, be formally brought to the notice of the Local and Home Authorities of the Railway Companies.

* Letter No. 1,258, dated 2nd May 1873.
" " 2,025, " 14th Aug. "

* Para. 4 of letter No. 1,447 G. R., dated 16th August 1873.

3. The Consulting Engineer now submits the results of some extremely interesting experiments which have been carried out both on the Madras and South Indian Railway, designed to show the comparative advantages of English, Australian, and Indian coals.

4. The experiments have evidently been conducted with considerable attention, and care taken that the trial of each description of coal should be carried on under conditions as little varying as possible. The time occupied with the experiments as well as the similarity of the results obtained by the two Companies, acting independently, afford an additional guarantee of their reliability.

5. The results are summarized in paragraph 2 of the Consulting Engineer's letter, and, as observed by that officer, exhibit the Indian coal in an exceptionally favorable light; for, while the average consumption per mile is only 31·70 lbs. against Australian 29·40, and English 33·47, the cost compares still more favorably, being only Annas 4 Pies 6·96 against Australian Annas 5 Pies 7·31, and English Annas 7 Pies 4·94. It appears, moreover, that the Agent of the Madras Railway has received an offer of supply which will reduce the cost of Indian coal to 4 Annas per mile run. The Indian coal used is known as Sanktoria, and was obtained from the Raneegunge collieries.

6. His Excellency the Governor in Council highly approves of the arrangements made by the local Railway Authorities to utilize the produce of the Indian fields, and desires that the behaviour of the coal may continue to be carefully watched, and further reports of the quantity used, and relative cost per mile, may be submitted from time to time. Arrangements should also, if practicable,

be made for determining the comparative amount of sparks, smoke, and dust or ash emitted by the various coals when under combustion.

7. These papers will be forwarded for the information of the Government of India.

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government.

No. 317. (DOCKET No. 3,533, dated 16th December 1874.)

COPY of the above forwarded to the Government of India.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

Exd. S. T. Austin.

Spare Copies

No. 100

SOUTH INDIAN RAILWAY.

Agent's Office.

Negapatam, 15th September 1876.

From

THE AGENT,

South Indian Railway,

To

THE CONSULTING ENGINEER,

for Railways,

MADRAS.

Sir

I have the pleasure to forward herewith, for your information, copy of a report from this Company's Locomotive Superintendent regarding certain recent comparative trials of English, Australian, and Indian coal, in the working of our trains

I have the honor to be
Sir
Your most obedient Servant
William Betts
Agent

Letter from the Locomotive Superintendent to the Agent
dated 2nd September 1874 to 1874

South Indian Railway

Encl

From send you Mr. Galbraith's result of his English and Australian coal trials with the engines as requested by the Board. I have also interpreted a trial example of Bengal coal / Ranegunge Sanktoria / I have been long obtaining here results, as I wished the trials to be made in such a case under circumstances as nearly as possible similar, and also because at the time the Board's orders were communicated to me I had no English coal but I could get all I have if summoned with other coal in here trials the same Owner, Engine, and Class of train has been employed. You will observe that very former results have been fully borne out by subsequent trials with superior English coal for locomotive purposes — &c. Southern coal has subsequently proved inferior. I am only informed for the very favourable results by superior English coal to be fresh, Mr. Galbraith the other Examiner and that the heavy load limited it better. I would suggest a shipment from Calcutta being obtained, say for 500 tons

/ True copy /
Wm Galbraith
Chief Clerk

The Agents
S. I. Railway
To
The Consulting Engr.
for Railways

Dated 15th } September 1874
Read 16. }
Instt.

No 100

P.G. 16 Dec 74
In B No 315

Forwarding copy of a report from the Locomotive Superintendent regarding certain recent comparative trials of English, Australian and Indian Coals.

MW. 7093/74
7

South Indian Railway

Locomotive Department

Trial of English Coal

Date		Engine No	No. of vehicles	Miles run	Gross weight of Train Tons cwt	Fuel consumed lbs	Fuel per mile run	Ash per cent of fuel used	Average pressure of steam	Water consumed in gallons	Water consumed in lbs	Water evaporated per lb of Coal	Average evaporation	Remarks
1874 June	20	3	16	82	127. 16. 0. 10	2732	33.31	9.26	88	2133	21,330	7.80		Strong wind
"	22	3	16	82	139. 14. 2. 14	3029	36.93	8.68	88	2,418	24,180	7.98	7.92	do
"	25	3	16	82	150. 3. 3. 26	3029	36.93	6.60	88	2,418	24,180	7.98		Fair weather
		1	2	3	4	5	6	7	8	9	10	11	12	13

Trial of Australian Coal

1874 June	27	3	15	82	128. 1. 0. 4	2138	26.07	12.33	88	20064	20,062	9.38		
Augt	16	2	16	82	148. 1. 2. 20	3024	36.87	16.40	88	2727	27,275	9.02	9.20	Fair weather
"	25	4	16	82	134. 10. 0. 8	2576	31.41	11.29	88	2376	23,750	9.22		

Trial of Indian Coal

1874 August	18	2	16	82	166. 12. 1. 10	2688	32.77	18.86	88	2848	28,480	10.50		
"	20	2	16	82	156. 2. 0. 5	2576	31.41	17.62	88	2539	25,390	9.85	10.28	Fair weather
"	22	4	16	82	166. 19. 0. 17	2688	32.77	15.29	88	2847	28,470	10.50		

Negapatam
3rd September 1874

N3 In each case the trials took place on the same trains between Negapatam and Trichinopoly / Material Specials / and the same Driver was employed

(Signed) E. G. Cheward
Loco' Supt

True copy
Wm Calthorpe
Chief Clerk

No. 919

MADRAS RAILWAY.

AGENT AND MANAGER'S OFFICE.

Madras, 14th October 1874

From

R. D. Elwin Esqre

Agent and Manager. M. R. Co.

To

Lt Col. J. Hell Shaw Stewart, R.E.

Consulting Engineer for Railways.

Sir,

With reference to previous correspondence and in continuation of my letter of the 24th of July last, No 647, I have the honour to enclose herewith for submission to Government a copy of the Acting Locomotive Superintendent's Report upon the trials he has recently made in view to determine the comparative merits, as Locomotive fuel, of English, Australian and Indian Coals. I also enclose copies of the two statements referred to in the Report.

2. The results shown by the trials are favourable to the Australian and Indian Coals, especially the latter, and I propose to suggest to Govt, &c. and the policy of making arrangements for shipping smaller quantities of English coal in order to admit of our making larger purchases of fuel that is known to be so much more economical in working.

No 872 - 8th October 1874.

Rd. 16 Dec/74
Ans 13 Jan 75
M 29 Dec 74

17

3. - The price we are at present paying for Indian Coal is Rs. 21-8-0 per ton delivered in our yards, but I have reason to believe that a considerable reduction in this rate would be effected were there greater facilities for obtaining freight for Coal from Calcutta to Madras.

I have the honour to be,
Sir,
Your most Obedient Servt.

Chas. J. Lawrie
Kerr Tweed & Co Managers.

Encl

MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer

for Railways.

P.S. D/16 Dec 1874
Ltr No. 315.

Dated 14th Feby 1874.

Recd. 15 Inst.

No. 919.

Forwarding Copy of Letter from the Chief Engineer, Eastern Division, Bengal, reporting the result of a trial made by him of Indian Coal, and Newcastle Coal.

MP. 7093 1/74

No 372

Madras Railway
Locomotive Superintendents Office
Peramboor Works
8th October 1874.

The Agent and Manager
Dear Sir,

Referring to the Correspondence noted in the margin, I beg to report, for your information, the result of the several trials which have been made with Indian and Australian Coals, as compared with the Coal received from England.

Indian Coal

To agent & Manager No 31 - 6th Feby/74
From ——— Do ——— " 2029 - 3d July "
To ——— Do ——— " 261 - 17th " "
From Cons Engr " 811 - 28th Augt "

Australian Coal

From Board — No 503 - 17th Jany/73 Board's Letter No 4
From Agent & Manager " 595 - 19th Feby "
From Board — " 521, 5th Dece/73 Letters 5 & 6
From agent & Manager " 103 - 10th Jany 1874
From ——— Do ——— " 1036, 1st April "
From ——— Do ——— " 1697, 28th May "

2. The first trials were made during the months of April, May and June, when Patent Fuel, Australian Coal, and Kastungs Hartley Coal were used respectively with three Engines of the same class, and doing similar work; each description of Coal being used by each Engine in rotation for the space of one month. In the month of June trials were likewise made of the Indian

Engines with the respective descrip-
tions of Coal - which is also shewn the
Cost per mile and the relative per
Centage of the Cost of the fuel
Consumed. The Comparison
points evidently in favour of the
Indian and Australian Coals, the
Cost of which stands respectively
as 4d. 9.28 P and 5d. 5.21 P per mile,
against 6d. 11.75 P, 7d. 1.28 P and 7d. 1.42 P,
the price of the English Coals. The
Consumption per mile of the Indian
Coals is 31.08 lbs, and of the Australian
Coal 27.85 lbs, while that of the English
Coal is from 30.16 lbs to 32.83 lbs.

9. The Australian Coal is of
very good quality, steaming well,
and making very little clinker
or ash.

10. The Indian Coal also
steams well, but, from the large
quantity of ash formed, the fire-
box and ash-pan have frequently
to be cleaned out on the journey.
This has been, however, to a great
extent remedied by a special
arrangement of the fire-bars. The
clinker is very small, and easily
removed.

11. Taking into Consideration the

the results which I have stated, and
the general condition of the Indian
and Australian Coal which has been
received, I think that further
purchases of these two descriptions
of fuel may with advantage be
made.

Yours faithfully
(Signed) C. C. Boodle
Ag Loco. Superintendent

(True Copy)

Agent Engineer

Engd

A

Madras Railway.

Locomotive Department.

Statement exhibiting in detail the weekly results of the several trials made on Locomotive Engines with Australian, Indian and English Coal

Date	No. of Engine	Total miles run	Quantity of fuel Consumed	Average number of Vehicles hauled per mile	Average Consumption of fuel per mile
			cwts. lbs.		lbs.
			Australian Coal Exc "Bengal"		
1st Week	71	737	173 . 16	14 . 2	26 . 01
2. do	70	737	161 . 84	15 . 4	24 . 58
3. do	61	737	190 . 56	15 . 0	28 . 95
4 do	64	737	187 . 56	15 . 3	28 . 49
5 do	68	737	187 . 0	15 . 2	28 . 42
			Indian Coal Exc "Olive Branch"		
1st Week	70	737	182 . 56	14 . 4	27 . 73
2. do	72	737	207 . 84	14 . 9	31 . 57
3. do	68	737	203 . 56	15 . 1	30 . 93
4 do	61	737	212 . 56	15 . 2	32 . 29
5 do	71	737	216 . 56	15 . 7	32 . 90
			Compsn Hartley Exc "Orion"		
1st Week	72	737	208 . 24	16 . 3	31 . 64
2 do	61	737	196 . 84	15 . 6	29 . 90
3 do	70	737	180 . 0	14 . 4	27 . 35
4 do	68	737	211 . 28	15 . 0	32 . 10
5 do	71	737	196 . 28	15 . 5	29 . 82

Date	No of Engine	Total miles run	Quantity of fuel consumed	Average number of Vehicles hauled per mile.	Average Consumption of fuel per mile.
		Cowper Cwts Hartley Co Cwts "Ella"			
1st Week	61	737	199. 28	15. 0	30. 28
2. do	68	737	209. 28	14. 4	31. 80
3. do	71	737	202. .	15. 9	30. 70
4th do	70	737	188. .	15. 1	28. 57
5th do	64	737	212. .	15. 4	32. 22
		Hastings Hartley Co "Lena"			
1st Week	68	737	212. .	15. 0	32. 22
2. do	71	737	217. 28	16. 0	33. 01
3. do	64	737	220. .	12. 9	33. 43
4. do	70	737	205. .	16. 8	31. 15
5th do	61	737	226. .	14. 8	34. 34

Locomotive Superintendent's Office
8th October 1874.

Hy C. C. Roadle
Ag. Locomotive Superintendent.

1 True Copy

B

Madras Railway.

Locomotive Department.

Statement shewing the average results of the several trials with Australian, Indian and English Coal; exhibiting also the cost per ton, the actual cost per mile, and the relative percentage of the cost per mile of each description of fuel.

Description of Fuel	Total miles run	Total Consumption of fuel in Cwts = lbs		Average Consumption per mile lbs	Average number of Vehicles per mile	Cost per ton including Landing charges &c.	Cost per mile run	Relative percentage of cost per mile
				lbs			Rs. A. P.	
Australian Coal	3685	899	100	27.35	15.02	27.13.1	5.5.21	17.30
Indian Coal	3685	1022	84	31.08	15.06	21.8.	4.9.28	15.20
2 pr Hawthorn Leslie "Orion"	3685	992	52	30.16	15.36	32.6.4	6.11.75	22.22
2 pr Hawthorn Leslie "Ella"	3685	1010	56	30.71	15.16	32.6.4	7.1.28	22.62
2 pr Hawthorn Leslie "Lewis"	3685	1080	28	32.83	15.10	30.5.8	7.1.42	22.66

Locomotive Superintendent's Office
8th October 1874.

True Copy
Agent & Manager

Hy C. C. Boodle
Ag. Locomotive Superintendent

Railway Department. CONSULTING ENGINEER'S OFFICE.

No.

From

LIEUT.-COLONEL J. H. M. SHAW STEWART, R.E.,

Consulting Engineer for Railways,

To

COLONEL G. W. WALKER, R.E.,

Secretary to Government,

Public Works Department.

Fort Saint George.

SIR,

vide Proceedings Madras Government 25th September 1873 No. 2368.—

Adverting to paragraph 4 of the letter from the Government of Madras under date the 16th August 1873, No. 1447 P., I have the honour to state that shipments of Australian coal have lately been received by both of the Railway Companies in this Presidency; and that trials have also been made of Bengal coal. In the matter of cost, the comparison between these coals and the last received English coal is as follows:—

Coal	Madras Railway cost per ton as received into store at Madras	South Indian Railway cost per ton as received into store at Negapatam
Australian	27. 13. 1	25. 12. 0
Indian	21. 8. 0	19. 0. 0
English	31. 11. 5	30. 6. 0

The

The Australian Coal was in both cases shipped at Newcastle, New South Wales. The supply received by the Madras Railway is what is known as "Best Waratah" coal. The Indian coal was in both cases obtained from the Panegunge collieries, and is known as "Sanktoria" coal.

2. With reference to this subject, I beg to enclose letters* from the Agents of the two Companies, giving the interesting results of trials which have been lately made with a view to determine the comparative value for locomotive purposes of the three descriptions of coal. These results, which may be summarised as follows, will be seen to agree in a remarkable manner:-

Coal	Madras Railway Average consumption per mile	Madras Railway Cost per mile run	South Indian Railway Average consumption per mile	South Indian Railway Cost per mile run
	lbs	A. P.	lbs	A. P.
Australian	27.35	5 - 5.21	31.45	5. 9.41
Indian	31.08	4. 9.28	32.32	4. 4.64
English	31.23	7. 0.89	35.72	7. 9

placing English coal decidedly at the bottom of the list, even as regards the locomotive value of the coal per lb, irrespective of its cost. The result of the experiments have exhibited the Indian coal in an unexpectedly favourable light, and I understand from the Agent of the Madras Railway Company that he has received an offer to supply coal of the same description and quality as that experimented with, at a rate of Rs. 18. 4 - 0 per ton delivered in store at Madras. This would reduce the Locomotive fuel expenses to 4 annas per mile run, being about half the cost of English coal, and about two-thirds that of Australian coal.-

I have the honour to be
Sir
Your most obedient servant

Madras
10th November
1874
Ex Bud.

V Mantlewurst Lieut. R.E.
Consulting Engineer for Railways

* From Agent S. I. Ry. Co's dtd 14th October 1874.
— " — P. Ry. Co's — 15th September 1874.

P. W. 1874 Dept.

Proceedings of the Madras Govt

Read the following

From the Consulting Engineer for Railways, dated 10th

3532

The enclosed letter from the Agent of the Madras and Southern Mahratta Railway, attracted the attention of the Govt of India in November 1872, and they desired to be furnished with information as to whether Indian Collieries could not be utilized with advantage instead, wherever practicable.

Submitted.

Dep. Sec. to Govt.

23/11/74

Under Secy

Respectfully submitted for the consideration of Government.

23/11

Under Secy

Read and Recorded

P. W. 1874 Dept.

Proceedings

RAILWAY DEPARTMENT.

No: 7093

From

The Consulting Engineer
for Railways,

To

The Secretary to Government,
P. W. Department,
Fort Saint George.

Dated 10 } November 1874.
Recd. 11 }

G.O. No. 688.

Submitting letters from the Agent to the Madras and Southern Mahratta Railway Co. reporting the results of the trial of English, Australian and Indian Coal.

G.O. No: 3532. 16-12-74

Ex 21-11-74

Dep. Sec. to Govt. 22-11-74

and patent fuel having hitherto formed the staple of consumption on the Railways in this Presidency.

2. The Consulting Engineer accordingly submitted reports with calculations of the probable cost of getting coal from the Lower Godavery fields by inland water carriage to Madras; and these were duly furnished to the Government of India, with a suggestion that further information

× Letter No: 1250 dy 2d May 1873
" " 2025 " 14 Augt "

a para 4 of letter No 1447 G.R. dy 18 August 1873.

might be obtained from the Government of New South Wales as to the cost and description of Australian Coal best suited to Locomotive purposes. The Government of India in reply desires that the subject of Australian Coal should in the first instance, be formally brought to the notice of the local and home authorities of the Railway Companies.

3. The Consulting Engineer now submits the results of some extremely

interesting experiments which have been carried out both on the Madras and Southern of India Railway, designed to show the comparative advantages of English, Australian and Indian Coals.

The experiments have evidently been conducted with considerable attention, and care taken that the trial of each description of coal should be carried

carried on under conditions as little varying as possible. The time occupied with the experiments as well as the similarity of the results obtained by the two Companies, acting independently, afford an additional guarantee of their reliability.

The results are summarized in para 2 of the Consulting Engineer's letter, and, as observed by that Officer, exhibit the Indian Coals in

in an exceptionally favourable light: for, whilst the average consumption per mile is only 31.7d. against Australian 29.4d, and English 33.4d, the cost compares still more favourably, being only 4.6d. against Australian 5.7.31, and English as P. 7.494. It appears, moreover, that the Agent of the Madras Railway has received an offer of supply which will reduce the cost of Indian Coal

~~to about half that obtained from Inchwood, and about two thirds that of Australian Coal~~ 4 annas per mile ~~nine~~

The Indian Coal used is known as Sanktoria, and was obtained from the Raniee Guaje Collieries.

His Excellency the Governor in Council highly approves of the arrangements made by the local Railway Authorities to utilize the produce of the Indian Fields; and desires that the behaviour of the coal may continue to be carefully watched, and further

reports of the quantity used, and relative cost per mile may be submitted from time to time.

† These papers will be forwarded for the information of the Government of India

Ry Dept. No. 3523

Copy of the above forwarded to the Govt of India

Genl

315 - 317

Ltr 21-11-74

* Arrangements should also, if practicable be made for determining the comparative amount of sparks, smoke, and dust or ash emitted by the various coals when under combustion -

Genl

1/12

C. E. for Ry: ✓ (61.C)
D. E. Presidency ✓ (2 -)
Military Dept ✓ (6 -)

Desp. 17/12/74.

Sign 430 ✓. Copies despd 17/12/74.

Letter from the Consulting Engineer for Railways No: 688 dated 10th November 1874.

47

It has subsequently occurred to the Secretary that the trials of the Comparative merits of Coals, to which the above letter treats, should have reference also to the comparative amount of sparks, smoke and dust or ash emitted when under combustion - and a para to this effect has accordingly been added to the draft.

Commr for Col R.R.
Secy to Govt
P.W.D.

7093

Govt. of 1874 Madras.

PUBLIC WORKS.

To

The Chairman of the
Secretary of India

Dated

Rcvd. Encl.

G. O. 16 Dec. 1874. No. 35-23

Nos. 315-317.

Forwarding copy of
Proceedings passed on
papers submitted by the
Consg: Engr: for Rys-
reporting the results of
the experiments which
have been carried out
both on the Madras &
South Indian Rys.
designed to show
the comparative adv
vantages of English,
Australian, & Indian
Coals.

Coal Passing orders
on papers submitted
by the Consg: Engr: for
Railways, reporting the
results of the experiments
which have been carried
out ~~both~~ both on the
Madras & South Indian
Rys designed to show the
comparative advantages
of English, Australian, &
Indian Coals —