

(1) Number of pages 10

(2) Date of repair \_\_\_\_\_

(3) Initials of the Referencer \_\_\_\_\_

# MADRAS RECORD OFFICE.

## Government of Madras.

*Public Works*

DEPARTMENT.

|          |        |                     |
|----------|--------|---------------------|
| G.O. No. | 471-72 | (Ry) Press ✓<br>Mis |
| Dated    | 12-2   | 1877                |

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,  
12th February 1877. No. 471.*

---

No. 300. Read the following letter from Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, to Lieutenant-Colonel J. MULLINS, R.E., Secretary to Government, Public Works Department, dated Madras, 3rd February 1877, No. 83 :—

WITH reference to the Order of Government, dated 14th December 1875, No. 3,524, I have the honor to submit the accompanying statement embodying the results of trials which have been made in this Presidency with different descriptions of fuel used in locomotive engines.

2. The statement has been delayed in the hope that more complete information might be obtained regarding the experiments carried out on the Madras Railway, but I now learn from the Agent that no further particulars than those shown were recorded when the trials were made. With the present heavy pressure of work in the Locomotive Department, it does not appear desirable to undertake fresh experiments now; but the subject shall be kept in view, and any further information which may be obtained shall be communicated to Government.

Proceedings of the Madras Government, Public

Summary of Trials of different Samples of Coal

| Description of Coal.                         | No. of Vehicles. | Engine No. | Miles Run. | Gross weight of Train including Passengers, Engine and Tender in working order. | COAL.      |                  |                      |                    |
|----------------------------------------------|------------------|------------|------------|---------------------------------------------------------------------------------|------------|------------------|----------------------|--------------------|
|                                              |                  |            |            |                                                                                 | Quantity.  | Pounds per Mile. | Pounds per ton Mile. | Comparative Value. |
| Crown preserved Coal, Madras Railway         | 18-11            | 72         | 3,690      | ..                                                                              | Cwts. 777  | 23-58            | ..                   | ..                 |
| Ordinary Coal, "                             | 16-30            | 70         | 3,771      | ..                                                                              | 1,002      | 29-76            | ..                   | ..                 |
| Welsh and Hartley Coal, South Indian Railway | ..               | ..         | ..         | ..                                                                              | ..         | 26               | ..                   | ..                 |
| Patent Fuel.. { Large Crown, " (a)           | ..               | ..         | ..         | ..                                                                              | ..         | 20               | ..                   | ..                 |
| { Small, " "                                 | ..               | ..         | ..         | ..                                                                              | ..         | 21               | ..                   | ..                 |
| { Anchor, " "                                | ..               | ..         | ..         | ..                                                                              | ..         | 18               | ..                   | ..                 |
| Coal, Patent Fuel, "                         | ..               | 3          | 1,429      | ..                                                                              | 300        | 23-51            | ..                   | ..                 |
| Crown pressed Coal, Madras Railway           | 14-24            | 66         | 1,408      | ..                                                                              | 255        | 18-14            | ..                   | ..                 |
| Do. " "                                      | 12-99            | 59         | 1,408      | ..                                                                              | 245        | 19-47            | ..                   | ..                 |
| Ordinary " "                                 | 13-15            | 66         | 1,408      | ..                                                                              | 238        | 18-93            | ..                   | ..                 |
| Do. " "                                      | 13-10            | 59         | 1,408      | ..                                                                              | 282        | 22-43            | ..                   | ..                 |
| Coke, " "                                    | 13-41            | 58         | 2,816      | ..                                                                              | 287        | 22-76            | ..                   | ..                 |
| Welsh and Hartley Coal, "                    | ..               | ..         | ..         | ..                                                                              | 583        | 23-19            | ..                   | ..                 |
| Australian Coal, "                           | ..               | ..         | ..         | ..                                                                              | ..         | 26-00            | ..                   | ..                 |
| Coke and Coal mixed, "                       | 13-34            | 75         | 3,643      | ..                                                                              | { (b) 415  | 24-90            | ..                   | ..                 |
| Coal, " "                                    | 13-55            | 74         | 3,740      | ..                                                                              | { (c) 395  | 23-80            | ..                   | ..                 |
| Patent Fuel, " "                             | 13-46            | 58         | 1,820      | ..                                                                              | 795        | 22-15            | ..                   | ..                 |
| Coal, " "                                    | 12-80            | 58         | 3,640      | ..                                                                              | 360        | 24-46            | ..                   | ..                 |
| Patent Fuel, " "                             | 13-01            | 74         | 3,818      | ..                                                                              | 795        | 20-18            | ..                   | ..                 |
| Australian Coal, " (1)                       | 15-02            | ..         | 3,685      | ..                                                                              | 688        | 27-35            | ..                   | ..                 |
| Indian Coal, " (2)                           | 15-06            | ..         | 3,685      | ..                                                                              | 899 100    | 31-08            | ..                   | ..                 |
| Cowpen Hartley, (ex Orion) "                 | 15-36            | ..         | 3,685      | ..                                                                              | 1,022 84   | 30-16            | ..                   | ..                 |
| Do do. (ex Ella) "                           | 15-16            | ..         | 3,685      | ..                                                                              | 922 52     | 30-71            | ..                   | ..                 |
| Hastings do. (ex Lena) "                     | 15-10            | ..         | 3,685      | ..                                                                              | 1,010 56   | 32-83            | ..                   | ..                 |
| English Coal, South Indian Railway           | 16               | 3          | 82         | TONS. 127 16 0 10                                                               | lbs. 2,732 | 33-31            | ..                   | ..                 |
| Do. " "                                      | 16               | 1          | 82         | 139 4 2 4                                                                       | 3,029      | 36-93            | ..                   | ..                 |
| Do. " "                                      | 16               | 3          | 82         | 150 3 3 26                                                                      | 3,029      | 36-93            | ..                   | ..                 |
| Australian, " "                              | 15               | 3          | 82         | 128 1 0 4                                                                       | 2,138      | 26-07            | ..                   | ..                 |
| Do. " "                                      | 16               | 2          | 82         | 148 1 2 20                                                                      | 3,024      | 36-87            | ..                   | ..                 |
| Do. " "                                      | 16               | 4          | 82         | 134 10 0 8                                                                      | 2,576      | 31-41            | ..                   | ..                 |
| Indian Coal, (Raneegunge Sanktoria) S.I. Ry. | 16               | 2          | 82         | 166 12 1 18                                                                     | 2,688      | 32-77            | ..                   | ..                 |
| Do. " "                                      | 16               | 2          | 82         | 156 2 3 8                                                                       | 2,576      | 31-41            | ..                   | ..                 |
| Do. " "                                      | 16               | 4          | 82         | 166 29 0 17                                                                     | 2,688      | 32-77            | ..                   | ..                 |
| Beldangah Coal, South Indian Railway         | 12               | 1          | 86         | 98 7 2 0                                                                        | 3,058      | 35-56            | ..                   | ..                 |
| Do. " "                                      | 13               | 1          | 86         | 107 13 2 0                                                                      | 3,058      | 35-56            | ..                   | ..                 |
| Do. " "                                      | 12               | 2          | 86         | 98 7 2 0                                                                        | 2,968      | 34-51            | ..                   | ..                 |
| Do. " "                                      | 13               | 2          | 86         | 107 13 2 0                                                                      | 2,968      | 34-51            | ..                   | ..                 |
| Do. " "                                      | 12               | 2          | 86         | 98 7 2 0                                                                        | 3,136      | 36-46            | ..                   | ..                 |
| Bengal Coal, (ex Palmyra) "                  | 15               | 6          | 82         | 123 2 4 10                                                                      | 2,265      | 27-62            | ..                   | ..                 |
| Do. " "                                      | 16               | 6          | 82         | 103 12 3 4                                                                      | 2,020      | 24-64            | ..                   | ..                 |
| Do. " "                                      | 16               | 6          | 82         | 116 10 1 4                                                                      | 2,436      | 29-70            | ..                   | ..                 |
| Do. " "                                      | 16               | 6          | 82         | 125 5 1 26                                                                      | 3,170      | 38-68            | ..                   | ..                 |
| Do. " "                                      | 16               | 6          | 82         | 119 10 3 22                                                                     | 3,000      | 36-58            | ..                   | ..                 |
| Do. " "                                      | 16               | 6          | 82         | 112 0 2 6                                                                       | 2,913      | 35-52            | ..                   | ..                 |
| Scotch Coal, " "                             | 21               | 50         | 79         | *115 13 2 0                                                                     | 2,212      | 28-00            | ..                   | ..                 |
| Do. " "                                      | 21               | 50         | 79         | *114 19 0 0                                                                     | 2,326      | 29-44            | ..                   | ..                 |
| Do. " "                                      | 21               | 50         | 79         | *125 5 2 0                                                                      | 2,400      | 30-38            | ..                   | ..                 |
| Do. " "                                      | 24               | 50         | 79         | *130 7 1 0                                                                      | 2,520      | 31-89            | ..                   | ..                 |
| English Coal, screened                       | 23               | 50         | 79         | *128 1 3 0                                                                      | 2,336      | 29-56            | ..                   | ..                 |
| Do. " "                                      | 24               | 50         | 79         | *131 7 3 0                                                                      | 2,100      | 26-58            | ..                   | ..                 |
| Do. " "                                      | 22               | 50         | 79         | *125 3 1 0                                                                      | 2,362      | 29-89            | ..                   | ..                 |
| Do. unscreened                               | 22               | 50         | 79         | *123 2 1 0                                                                      | 2,073      | 26-24            | ..                   | ..                 |
| Do. " "                                      | 21               | 50         | 79         | *117 7 3 0                                                                      | 2,216      | 28-05            | ..                   | ..                 |
| Do. " "                                      | 18               | 50         | 79         | *108 12 1 0                                                                     | 2,200      | 27-84            | ..                   | ..                 |
| Do. " "                                      | 20               | 50         | 79         | *125 1 3 0                                                                      | 2,156      | 27-29            | ..                   | ..                 |
| Do. " "                                      | 20               | 50         | 79         | *125 1 3 0                                                                      | 1,904      | 24-10            | ..                   | ..                 |
| Australian " "                               | 20               | 48         | 79         | *121 17 3 0                                                                     | 2,110      | 26-70            | ..                   | ..                 |
| Do. " "                                      | 16               | 69         | 79         | *106 7 1 0                                                                      | 2,128      | 26-93            | ..                   | ..                 |
| Indian (Raneegunge) "                        | 20               | 73         | 79         | *121 17 3 0                                                                     | 1,792      | 26-68            | ..                   | ..                 |

\* The tare only of vehicles with Engine and

Works Department, 12th February 1877. No. 471.

on Madras and South Indian Railways.

| Average pressure of Steam. | WATER             |                  |                               | ASH.      |                          | Date.                                           | Remarks.                                                                                                                                                                                                                                                                                                                        |
|----------------------------|-------------------|------------------|-------------------------------|-----------|--------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | Consumed Gallons. | Consumed Pounds. | Evaporated per Pound of Coal. | Quantity. | Percentage of Coal used. |                                                 |                                                                                                                                                                                                                                                                                                                                 |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | During the month ending 31st October 1866.      | { Twenty-seven trips.<br>Twenty-nine trips.<br>(a) This fuel is preferable as it packs better and there is less loss from it from dust. Dirt and sand do not mix with it. Strong wind blowing during a great portion of its trial. Engines Nos. 2 and 3 are the same class, running the same train under similar circumstances. |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | May 1869.                                       | Sixteen Trips.                                                                                                                                                                                                                                                                                                                  |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | June 1869.                                      | Sixteen "                                                                                                                                                                                                                                                                                                                       |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | From 21st May to 22nd June 1869.                | Sixteen "                                                                                                                                                                                                                                                                                                                       |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | From 1st to 31st July 1869                      | Thirty-two trips.                                                                                                                                                                                                                                                                                                               |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | About June 1870.                                | Favorable.                                                                                                                                                                                                                                                                                                                      |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | During the month of June 1872.                  | (b) Coke. (c) Coal ex Dacre and Himalaya.                                                                                                                                                                                                                                                                                       |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | In Mar. and April 1872.                         | Ex Himalaya.<br>Ex Queen of the North and Agamemnon.<br>Ex Himalaya.<br>Ex Queen of the North.                                                                                                                                                                                                                                  |
| ..                         | ..                | ..               | ..                            | ..        | ..                       | During the months of April, May, and June 1874. | (1) Of good quality, steams well, and makes very little clinker or ash.<br>(2) Steams well, large quantity of ash, clinker very small.                                                                                                                                                                                          |
| 88                         | 2,133             | 21,330           | 7-80                          | ..        | 9-26                     | 29th June 1874                                  | Strong wind.                                                                                                                                                                                                                                                                                                                    |
| 88                         | 2,418             | 24,180           | 7-98                          | ..        | 8-68                     | 22nd do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 88                         | 2,418             | 24,180           | 7-98                          | ..        | 6-60                     | 25th do.                                        | Fair weather.                                                                                                                                                                                                                                                                                                                   |
| 88                         | 2,006             | 20,062           | 9-38                          | ..        | 12-33                    | 27th do.                                        | Do. In each of the six cases the trials took place on the same trains (Material special) and same drivers.                                                                                                                                                                                                                      |
| 88                         | 2,727             | 27,275           | 9-02                          | ..        | 16-40                    | 16th August 1874                                | Supposed to be fresher than other samples.                                                                                                                                                                                                                                                                                      |
| 88                         | 2,375             | 23,750           | 9-22                          | ..        | 11-29                    | 25th do.                                        | Coal displayed a propensity to clinker very fast.                                                                                                                                                                                                                                                                               |
| 88                         | 2,848             | 28,480           | 10-50                         | ..        | 18-86                    | 18th do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 88                         | 2,539             | 25,390           | 9-85                          | ..        | 17-62                    | 20th do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 88                         | 2,847             | 28,470           | 10-50                         | ..        | 15-29                    | 22nd do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 85                         | 2,028             | 20,280           | 6-65                          | ..        | 23-80                    | 18th August 1875                                | Do.                                                                                                                                                                                                                                                                                                                             |
| 85                         | 1,910             | 19,100           | 6-24                          | ..        | 18-86                    | 19th do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 85                         | 2,376             | 23,760           | 8-00                          | ..        | 17-62                    | 21st do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 85                         | 2,170             | 21,700           | 7-31                          | ..        | 15-26                    | 22nd do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 85                         | 2,131             | 21,310           | 6-79                          | ..        | 11-86                    | 23rd do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 85                         | 1,598             | 15,980           | 7-05                          | ..        | 29-00                    | 19th April 1875                                 | Do. Do. high wind and heavy rain.                                                                                                                                                                                                                                                                                               |
| 85                         | 1,639             | 16,390           | 8-11                          | ..        | 35-09                    | 20th do.                                        | This coal clinkered very much.                                                                                                                                                                                                                                                                                                  |
| 85                         | 1,762             | 17,620           | 7-24                          | ..        | 26-88                    | 22nd do.                                        | Material train, steady load, through run from Negapatam to Trichinopoly. Coal displayed a propensity to clinker very fast.                                                                                                                                                                                                      |
| 85                         | 1,965             | 19,650           | 6-19                          | ..        | 24-03                    | 24th do.                                        | Coal displayed a propensity to clinker very fast.                                                                                                                                                                                                                                                                               |
| 85                         | 1,884             | 18,840           | 6-28                          | ..        | 23-03                    | 27th do.                                        | Do.                                                                                                                                                                                                                                                                                                                             |
| 85                         | 1,870             | 18,700           | 6-41                          | ..        | 26-29                    | 4th May 1875                                    | Do.                                                                                                                                                                                                                                                                                                                             |
| 105                        | 1,397             | 13,970           | 6-31                          | 158       | 7-14                     | 2nd February 1876                               | Detention, 1 foot 0 inches, fine weather.                                                                                                                                                                                                                                                                                       |
| 105                        | 1,355             | 13,550           | 5-82                          | 256       | 11-00                    | 24th do.                                        | Do. 0 " 44 " do.                                                                                                                                                                                                                                                                                                                |
| 105                        | 1,098             | 10,980           | 4-56                          | 237       | 9-87                     | 26th do.                                        | Do. 0 " 40 " strong breeze.                                                                                                                                                                                                                                                                                                     |
| 105                        | 1,231             | 12,310           | 4-88                          | 203       | 8-05                     | 29th do.                                        | Do. 0 " 53 " do.                                                                                                                                                                                                                                                                                                                |
| 100                        | 1,476             | 14,762           | 6-31                          | 202       | 8-64                     | 9th March 1876                                  | Do. 0 " 52 " do.                                                                                                                                                                                                                                                                                                                |
| 100                        | 1,526             | 15,260           | 7-27                          | 148       | 7-05                     | 11th do.                                        | Do. 0 " 48 " fine weather.                                                                                                                                                                                                                                                                                                      |
| 105                        | 1,582             | 15,820           | 6-68                          | 119       | 5-07                     | 13th do.                                        | Do. 0 " 42 " strong breeze.                                                                                                                                                                                                                                                                                                     |
| 110                        | 1,527             | 15,270           | 7-36                          | 135       | 6-51                     | 2nd do.                                         | Do. 0 " 45 " fine weather.                                                                                                                                                                                                                                                                                                      |
| 100                        | 1,457             | 14,570           | 6-57                          | 167       | 7-53                     | 4th do.                                         | Do. 0 " 45 " do.                                                                                                                                                                                                                                                                                                                |
| 100                        | 1,398             | 13,980           | 6-35                          | 261       | 11-86                    | 5th do.                                         | Do. 0 " 45 " do.                                                                                                                                                                                                                                                                                                                |
| 105                        | 1,454             | 14,540           | 6-74                          | 163       | 7-55                     | 7th do.                                         | Do. 0 " 45 " do.                                                                                                                                                                                                                                                                                                                |
| 100                        | 1,102             | 11,020           | 5-78                          | 119       | 6-25                     | 2nd April 1876                                  | Do. 1 " 2 " strong breeze.                                                                                                                                                                                                                                                                                                      |
| 110                        | 1,687             | 16,870           | 7-99                          | 281       | 13-31                    | 27th July 1876                                  | Do. 0 " 46 " heavy wind.                                                                                                                                                                                                                                                                                                        |
| 110                        | 1,462             | 14,620           | 6-67                          | 234       | 10-99                    | 30th do.                                        | Do. 0 " 48 " do.                                                                                                                                                                                                                                                                                                                |
| 110                        | 1,431             | 14,310           | 7-91                          | 339       | 18-91                    | 10th August 1876                                | Do. 0 " 53 " light wind.                                                                                                                                                                                                                                                                                                        |

Tender, not the gross weight.

(Signed) J. H. M. SHAW-STEWART, Lieut.-Colonel, R.E.,  
Consulting Engineer for Railways.

MADRAS,  
3rd February 1877.

5

PUBLIC WORKS DEPARTMENT,  
FORT ST. GEORGE, 12th February 1877.

No. 302.

No. 472.

FROM

THE JOINT SECRETARY TO THE GOVERNMENT OF MADRAS,  
*Public Works Department, Railway Branch,*

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,  
*Public Works Department.*

RAILWAY, No. 24.

SIR,—In reply to Mr. Furnivall's letter of the 24th November 1875, No. 2,844, R., I am directed to forward a statement tabulating the results of trials made upon the Madras Railways with different kinds of fuel.

2. The information now submitted is not as complete as His Excellency in Council could have wished. The pressure of work now prevailing upon the Railways precludes for the present further experiment. But the subject will be kept in view, and any results, which may hereafter be arrived at, will be communicated to the Government of India.

I have the honor to be,

Sir,

Your most obedient servant,

Lieut.-Colonel, R.E.,  
Joint Secretary to Government.

Exd. T. O'Connor.

Spare Copies

RAILWAY DEPARTMENT.

CONSULTING ENGINEER'S OFFICE,

Madras, 3<sup>rd</sup> February 1878.

No. 83

From

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

Consulting Engineer for Railways,

To

~~Major-General G. W. WALKER, R.E.,~~

Secretary to Government,

Public Works Department,

Fort Saint George.

SIR,

With reference to the  
order of Government dated  
14<sup>th</sup> December 1875. No. 3524,

I have the honour to submit  
the accompanying statement  
embracing the results of trials  
which have been made in  
this Presidency with different  
descriptions of fuel used in  
locomotive engines

2 The statement has been de-  
layed in the hope that more  
complete information might  
be obtained regarding the  
experiments carried out on  
the Madras Railway, but I  
now learn from the Agent  
that no further particulars—  
than those shown were recorded  
when the trials were made.  
With the present heavy pres-  
sure of work in the Loco-  
motive department it does  
not appear desirable to under-  
take fresh experiments now;

but the subject shall be kept  
in view, and any further in-  
formation which may be  
obtained shall be communi-  
cated to Government.

I have the honour to be

Yours

Your most obedient servant

W. M. Muntz, Lieut. Col. R. E.

Cons. Engr. for Railways

GD 14-12-75 No 3524.

P.W.D.  
5 FEB 77

No 1201

*[Faint, mostly illegible handwritten text in the top left section.]*

No 300  
Cir. 7-2-77. 12/10-2-77

*Submitters a statement showing the results of the tests made with different samples of wood put on the railways in the proceedings*

Received

Dated

*G. P. February 1877*  
No. 23  
Encl: 1

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

From  
The Consulting Engineer  
for Railways,

RAILWAY DEPARTMENT.

No 471 Public Works Department

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 12 Feb 77  
Read the following:—

From  
The Cons. Eng. for Railways } (No. 83 of 3<sup>rd</sup> Feb 1877)

Ordered that the following letter be sent to the Govt of India.  
(No. 472 of 12 Feb 77)

No 472  
To the Secy to the Govt of India

Sir,  
In reply to Mr. Furnivall's letter of the 24<sup>th</sup> November 1875, No. 2844 R., I am directed to forward a statement tabulating the results of trials made upon the Madras Railways with

different

*Exp. Rpt. Dispd. 3.3.77*

different kinds of fuel.

2. The information now submitted is not as complete as His Excellency in Council could have wished. The pressure of ~~the~~ <sup>the</sup> ~~business~~ <sup>business</sup> ~~pressing~~ <sup>pressing</sup> ~~upon~~ <sup>upon</sup> the Railways precludes for the present further experiment. But the subject will be kept in view, and any results, which may hereafter be arrived at, will be communicated to the Govt. of India.

44-672

5/12/01

Govt. of Madras.

PUBLIC WORKS.

To the Comr. Engg. for M.

Dated

Issued

Recd.

Encl.

G. O., 12 Feb 1877, No. 471

105. 300-301

Recd. in Reg.

also made upon the  
Madras Railways with  
different kinds of fuel  
eng orders or letters from  
the Comr. Engg. for M.  
submitting a statement  
relating the results  
to