BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

Financial (1899) Department.

CURRENT No. 817

E
A 2 24/2/99

From

The Revenue Department.

Order

No. 136 Revenue

Dated 23-2-99.

Received 24 FEB 1899

Registered ——do——

Enclosures one

Spare copies

SUBJECT.

Considering that the further experiments suggested by the Board of Revenue for the investigation of the Kanjamalai iron ore deposits are highly desirable in the public interests & stating that the proposals made by the Bd. will accordingly be laid before the Secy. of State for approval & that orders will issue in the Finl. Dept for the provision of the necessary funds in the budget estimates of the ensuing year.

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Government {1899} of Madras.

REVENUE.

Recd. } 1898. *Enclosures*

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G.O., No. 7, 4th January 1899.

JANUARY.

Salem Iron Ore and Sanctoria Coal.

Despatch from the Right Honourable the Secretary of State for India forwarding, with remarks, copy of a report from Professor Dunstan, of the Imperial Institute, on samples of —, communicated to the Board of Revenue (Land Revenue), in continuation of G.O., No. 686, Revenue, dated 19th November 1898, and to the Chamber of Commerce, Madras.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following despatch from the Right Honourable the Secretary of State for India, to His Excellency the Honourable the Governor in Council, Fort St. George, dated India Office, London, 1st December 1898, No. 17-R. :—

In continuation of my despatch, No. 10, dated the 25th August 1898, I forward copy of a report * from Professor Dunstan, of the Imperial Institute, on samples of Salem iron ore and Sanctoria coal. The statements in this report, while not gainsaying the analyses of the samples sent to Middlesborough, put a somewhat different complexion on the possibilities of Salem iron ore and Bengal coal for smelting purposes, and suggest further investigation.

* Letter from Sir F. Abel, dated 11th November 1898, with one enclosure.

Enclosures.

From Sir F. A. ABEL, Honorary Secretary and Director, Imperial Institute, to the Under Secretary of State for India, dated 11th November 1898, R. No. 445-4.

Referring to your letter of the 26th August 1896 (R. and S. 1786), with which you forwarded, by direction of the Secretary of State for India, a copy of reports concerning the tests and experiments carried out with Bengal coal and Salem iron ore at the works of Messrs. Bolckow, Vaughan & Co., of Middlesborough, I have the honour to request you to be so good as to submit to the Secretary of State the accompanying memorandum, prepared by the Director of the Scientific and Technical Department of the Imperial Institute, Professor Wyndham Dunstan, on the subject of the experiments in question, the results furnished by them, and the results of examination of Bengal coal and Salem iron ore, carried out in the Scientific Department of this Institute.

I venture to submit that the statements contained in this memorandum are worthy of careful consideration, in reference to the question which led to the experiments instituted at the Middlesborough works.

Memorandum on the trials by Messrs. Bolckow, Vaughan & Co. of samples of Salem iron ore and Bengal coal.

In connection with the correspondence which has taken place between Mr. H. G. Turner and the India Office with reference to Mr. Turner's application for a concession to smelt the Kanjamalai ore, I wish to draw attention to the following points.

In 1892 Mr. T. H. Holland, Assistant Superintendent of the Geological Survey of India, was deputed by the Government of India to secure for the Imperial Institute a representative collection of the iron ores of Madras. In transmitting the collection of samples Mr. Holland suggested that they should be experimentally examined (*see* Sir E. Buck's demi-official letter, No. 1088-29, to Sir Frederick Abel, dated 5th May 1892, F.S.S., No. 26).

The specimens were accordingly submitted to analysis in the laboratories of the Imperial Institute, and the results published in the Journal of the Imperial Institute, volume 2, No. 18 (June 1896).

This collection included six samples of ore from Kanjamalai in the Salem district of Madras, which, on analysis, furnished the following results :—

Number.	Available iron.	Insoluble Residue (Silica).	Lime.	Sulphur.	Phosphorus.
799	68·95	1·04	..	·16	·13
815	70·06	1·72	..	·20	..
873	63·57	8·89	..	·29	..
874	66·96	3·17	..	·10	..
812	36·44	46·95	..	·10	..
813	35·73	48·45	..	·29	·27

The average percentage of available iron is thus 56·95, the highest percentage being 70 and the lowest percentage 36. Out of the six samples four were therefore of excellent quality and only two inferior. The four samples are undoubtedly suitable for conversion into pig iron by smelting on the large scale, whilst the two samples are valueless for this purpose.

A specimen of the consignment of ore specially selected this year by Mr. Middlemiss, of the Geological Survey of India, for transmission to Messrs. Bolckow, Vaughan & Co., as typical of the Kanjamalai deposit, referred to in his memorandum of the 6th February 1898, furnished on analysis in the laboratories of the Imperial Institute the following results, which are in substantial agreement with those obtained by Messrs. Bolckow, Vaughan & Co., and recorded in their letter of the 28th July 1898 (*see* appended report on Salem ore and Sanctoria coal by Mr. J. E. Stead). In the following table, column 1 gives the results of the analysis made in the Scientific Department of the Imperial Institute, column 2 the results of Mr. Stead :—

	Imperial Institute.	Mr. Stead.
Iron	38·74	39·02
Insoluble residue (silica)	44·09	42·36
Lime	·365	1·00
Sulphur	·076	·03
Phosphorus	·14	·13

It is therefore clear that the specimen of Kanjamalai ore, regarded by Mr. Middlemiss as representative, is extremely poor and quite unsuitable for smelting in the blast furnace. In connection with the favourable opinion expressed by Mr. Jeremiah Head in his report to the Secretary of State, dated 11th March 1898, as to the possibility of smelting the Kanjamalai iron ore, it should be pointed out that he has taken, as provisionally representative of the ore, the results of the analysis of the best specimens from the Imperial Institute set, and has taken no account of the recorded results of the analysis of the two inferior specimens (Nos. 812 and 813) which correspond with the samples regarded by Mr. Middlemiss as an average representative portion of the Kanjamalai deposit.

Turning to the coal. One hundred tons of Bengal (Sanctoria) coal were forwarded to Messrs. Bolckow, Vaughan & Co. A sample from this consignment analysed in the Scientific Department of the Imperial Institute furnished the following results :—

Calorific value, 6,237 calories.
Fixed carbon, 52·83 per cent.
Volatile matter, 25·94 per cent.
Sulphur, ·168 per cent.
Phosphorus, ·039 per cent.

These results again are in substantial agreement with those obtained by Messrs. Bolckow, Vaughan & Co., from Mr. R. Robinson, and referred to in their letter of 28th July 1898. This sample of Sanctoria coal is, however, inferior to the two samples described in my "Report on the Coal Supply of India, 1898," which were sent to the Imperial Institute as representative of the coal of this colliery. The analysis of these two samples gave the following results :—

Serial number.	Fixed carbon.	Volatile matter.	Sulphur.	Ash.
1,163	49·4	39·3	1·63	11·29
1,168	49·32	39·94	1·53	10·74

It therefore appears that the consignment of coal sent to Messrs. Bolckow, Vaughan & Co., whilst containing a smaller proportion of sulphur, is much richer in mineral constituents (ash) than either of the two samples referred to in my Coal Report, there being, in fact

nearly twice as much ash in the coal consigned to Middlesborough, which, moreover, is stated to yield an unsuitable coke. Consequently I agree with Messrs. Bolckow, Vaughan & Co. that this sample of Sanctoria coal is unsuitable for smelting purposes.

We may, therefore, conclude that if the sample of Kanjamalai ore is, as Mr. Middlemiss asserts, an average specimen of this deposit, this ore cannot be seriously regarded as suitable for smelting, even after treatment by the magnetic separator. Similarly, if the sample of Sanctoria coal sent to Middlesborough is the only coal available for use in the blast furnace, then iron smelting can hardly succeed in Madras.

I am, however, of opinion that neither of these two points has been established. As regards the ore Mr. Middlemiss remarks :—

"Only occasionally, in small pockets or as veins or local accretions (not more than a few inches across), do we sometimes find masses of pure or almost pure magnetite. But it would not be fair to include these in any estimate of the general richness of the beds. It is doubtless due to some such specimens as these having been gathered that some of the analysis of the Kanjamalai ore carried out at the Imperial Institute gave such abnormally rich percentages of iron (about 70 per cent.)."

Now the specimens of ore referred to by Mr. Middlemiss as having been analysed at the Imperial Institute were selected by Mr, T. H. Holland as typical portions of the deposits. Four out of the six specimens are undoubtedly excellent samples of magnetite, which would repay smelting, whilst only two were of the inferior quality regarded by Mr. Middlemiss as representative. It is evident that, before any conclusion can be arrived at as to the value of the Kanjamalai deposit, it must be systematically sampled and analysed. I agree with Mr. Jeremiah Head's recommendations on this head.

As to the coal. I have no information with reference to the selection of the sample sent to Middlesborough. As I have pointed out, it is inferior to the sample of Sanctoria coal specially selected for analysis at the Imperial Institute by the Reporter on Economic Products to the Government of India. Of the 53 samples of coal derived from the various Bengal collieries and described in my report, a number would probably be suitable in composition and coking power for use in smelting iron ores.

The fuel question, therefore, requires further investigation before any decision as to the suitability of Bengal coal can be arrived at.

(Signed) WYNDHAM R. DUNSTAN,
Director of the Scientific Department
of the Imperial Institute.

10th November 1898.

ORDER—No. 7, Revenue, dated 4th January 1899.

Miscellaneous.

Communicated to the Board of Revenue (Land Revenue) in continuation of G.O., No. 686, Revenue, dated 19th November 1898, and to the Chamber of Commerce, Madras.

(True Extract.)

(Signed) G. S. FORBES,
Secretary to Government.

To the Board of Revenue (Land Revenue).
„ the Chairman, Chamber of Commerce, Madras.
„ the Editor's Table.

Exd. T. Lutchmiah Naidu.

85 Copies.

1899
Dept.
Enclos. No
To
C. No 87

CURRENT NO. 87

F. 16 4,000—18-10-98.

REVENUE DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

*Read again G. O. No. 7 dated 4th January 1899.

Read again also G. O. No. 96, dated 6th February 1899.

Read also Proceedings of the Board of Revenue, Land Revenue, Misc. No. 444, dated 4th February 1899 reporting to Government with remarks the rough estimate of the cost of collecting &c. 200 tons of Salem iron ore for the experimental purposes and stating that the Board has no information as to the cost of freight from London to Sweden.

Order thereon, Press No. 136 d/ 23rd Febry 1899.

The Government considers that the further experiments suggested by the Board of Revenue for the investigation of the Kanjamalai iron deposits are highly desirable in the public interests. The proposals made by the Board will accordingly be laid before the Secretary of State for approval.

2. From the Board's Proceedings last read above, the Government understands that, excluding the cost of collection of 200 tons of ore and storing them ready for despatch, the cost of the proposed experiments in Sweden will be about Rs. 6000. Orders will issue in the Financial Department for the provision of the necessary funds in the budget estimates of the ensuing year.

3. The following letters will be despatched to the Right Hon'ble the Secretary of State for India and the Government of India.

(True Extract.)

Secretary to Govt.

To the Bd.of Rev: L.R.
„ Financial Dept.

[G. 118.]
200—16-12-98.

Financial Department.

C. No.

TELEPHONE MESSAGE.

From

The Chief Secretary

~~CHIEF SECRETARIAT,~~

To

The A. G.

Dated 17th July 1899.

Orders are issuing for the continuation next year of experiments with Salem iron ore. No provision exists in the budget and a sum of Six thousand Rupees will be provided in the ~~final copy of the final~~ next year estimates. India will be asked to admit the provision.

Cmb. 17.7.99

17/7/99.

H. 11.23 15.7.99

Q Please return to B.C. after issue.

Financial department

C. no 817.

E

Order No 303 dt 27-2-99
Vide S.

Intimation of the provision required in the budget for next year, viz. 06 Lakh as amount for further experiments with Salem iron ore has already been given to the A. G. by a telephonic message dated the 18th instant.

A

Dispd ordinary 27/2/99.

2. The following telegram will be despatched to the Govt. of India, Finance and Commerce department, Calcutta.

"107 x Reference to Govts letter No. 137. Revenue of 23rd instant, G. P. O. P. please admit a provision of Rupees Fifteen thousand in the budget for next year under 26. B. Scientific departments — Exploration & Petroleum, coal, and minerals, urgently required for completion of experiments on Salem iron ore."

x In Press
+ addressed to Govt, P W D

Page 184 of e B. E.

2 nos A. G. (940) Despd
" Revenue (940) 28/2/99
B.C. in original rules 1/3/99 and put in 2/3/99
copies of budget filed (and Ref 27-2-99
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189 ,

CURRENT No.

ENCLOSURES TO C. No.

ORDER OF GOVERNMENT	A	A	A	A	A	A	A	
LETTER OF GOVERNMENT.								
STATEMENT WITH DITTO.								
PAPERS NOT FILED UP, BEING MEANT FOR DESPATCH IN ORIGINAL.								

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DEPARTMENT.

DEPARTMENT.

[F / 24.]
1,000—25-7-06.

Financial (1899) Department.

ORDINARY MS.

E

G.O., No. 303

DATED 27-2-99

INDEXED.

45
3
2/2/99

[Despatch Abstract.]

Stating that intimation of the provision required in the budget for next year will be made for further experiments in connection with Salem Iron Ore has already been given to the A.G. and telegraphing to the Govt. of India to admit a provision for that amount in the budget for next year.

27.2.99