Revenue (Geol) Department.

PRESS SERIES.

G.O., No. 144-45

Dated 10th March

[Despatch Abstract.]

Aluminous ore

Comng. to the Bd. of Rev. letter from Major R.H. Mahon, R.A., of Cossipore, requesting it to report, after consulting Mr. Middlemiss, whether ___ of certain description is available in this Presidency, and addressing the Govt. of India on the above subject.

No. 65-54

0
18 4,000—10-4-97.

Revenue (1898) Department.

CURRENT No. 1826

From Major R. H. Mahon R.A.
Foundry & Shell Factory
Cossipore.

Order No. 6554 C
III

Dated 1 Mar.

Received 7/3

Registered 7/3

Enclosures

Spare copies.

SUBJECT.

Replying to letter No. 961 dated 25 February 1898 on the question of the selection of an aluminous Indian ore to be mixed with the Salem ore &

BACK PAPERS.

O.O.	No.	Description.	Date.	O.O.	No.	Description.	Date.

ENCLOSURES PAPERS.

O.O.	No.	Description.	Date.	O.O.	No.	Description.	Date.
C.R.O. 3188/98.							

...England trading to the East Indies, in Conjunction with the Nabob Wolan Jau Omdetu' Mulck M Ummeerul Hind,

BACK PAPERS.

G.O.	No.	Department.	Date.
	180	[illegible]	25-2-98
	713	"	11-2-98
	427	"	27-1-98
	327	"	20-1-98
	224	"	17-1-98
	247	"	17-1-98
	196	"	14-1-98
	189	"	13-1-98

FURTHER PAPERS.

G.O.	No.	Department.	Date.

No. 65-54 C
III

Foundry and Shell Factory,
Cossipore, 18th March 1898.

From

Major R. H. Mahon R.A.

To The Acting Secretary,
Government of Madras.

Sir,

I have the honor to reply to your No 981 dated 25th February 1898 to state :-

The report contained in the Revenue Papers No. 92 of 1898 by Mr. C. S. Middlemiss is undoubtedly disappointing and completely reverses all the published statements concerning the richness of the Salem Iron beds previously published, the statements at pages 335 and 348 of Balls economic Geology. The report of messrs. king and Foote published in Volume IV of the Geological Memoirs the Hand book of the Imperial Institute relating to iron and many other statements and publications have all hitherto gone to show that inexhaustible beds of magnetite with a richness of about 60% iron existed in the neighbourhood of Salem and principally in the Kanjamallai Hill. If the present report is accepted as final the content of iron must now be set down at 40%

MADRAS GOVT. MUSEUM
17 MAR 98

and the whole Conception of an iron industry Radically altered - I have unfortunately not now available for reference the various books & notes which I have collected on the Subject but to the best of my Recollection Even Mr. Heads adverse Report Counded on a 60% ore - if this be reduced to 40% the situation would become still more diffienlt-

2. Referring to the question of an aluminous ore I have the honor to state that in a subsequent Communication to the Government of India, which is presumably to be found Among the papers, I Explained that however desirable an admixture of aluminous ore might be with a magnetite such as that stated to be available at Kanjamallai for general manufacture - the same was not a necessity for purposes of Experiment and I suggested that for the present investigation no necessity Existed for this class of ore to be obtained.

3. To complete the subject however and to reply to the present Enquiry it may be stated that the Kanjamallai ore has always been supposed to be generally similar in its nature to that used in Lancashire and Cumberland - A rich ore of which the principal impurity is Silica - And with this ore it has been found desirable to make an admixture of aluminous ores for the purpose of producing a more fusible slag - The following statement may clear the matter - it is Extracted from Jeans work on Steel - (page 359)-

"In this ore (the west coast of England is referred to) the principal impurity is Silica and unlike the Cleveland and most other ores it does not contain any alumina - It is therefore thought desirable at many places to mix it with aluminous ores for the purpose of producing a better slag and also in order to obtain greater regularity in the working of the furnace - The addition of these aluminous ores also gives the means of controlling in some measure the percentage of Silica in the iron".

4 Later on Mr. Jeans gives the Analysis of the most suitable aluminous ore as under :-

Silica	6 %
alumina	20.37 %
Peroxide of iron	71.68 %
water in combination ...	1.15 %

If the proposition to send aluminous ore is adhered to such an ore as described might be sent, but I consider this unnecessary at the present stage -

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

Major R.A.

Read C.No 15479

G.6 146-5/10-3-96

For orders

Please see note flagged E in file No 2479 dt 17.1.98

With reference to the remarks made by Major Mahon in Section III of his memorandum on the Manufacture of iron and Steel in India, the Govt of India was requested in letter No 222 dated the 31st March 1897, inter alia to obtain the advice of Major Mahon on the question of the collection and despatch to England, of a suitable aluminous ore of Indian origin, to be mixed with the Salem iron ore. The Govt of India, in replying to the above letter on the 5th November last, did not say whether any action was taken with reference to

bag 119 S 221/31.3.97 M.

G

letter dt 5-11-97 No 52 C&I
in No 1007/3.12.97 R.

to this Govt's request. In a subsequent letter dated the 30th November also, the Govt of India made no mention of it, but on the other hand requested that they might be furnished with "the views of the Govt of "Madras as to what alu- "minous ore of Indian origin, "it may be most desirable "to send for the purpose "of mixing with the Salem "ore".

It was thought that the Board of Revenue might be able to say in consultation with Mr Middlemiss what suitable aluminous ore could be had near the Salem beds and where, and the Govt of India's letter was therefore communicated to the Board of Revenue 'for report in Communi- 'cation with Mr Middle- 'miss' (Go No 247 of 17.1.98).

S in Go No 247 of 17.1.98

S

The current read above contains the Board's replies as well as that of Mr Middlemiss.

Mr Middlemiss says that Major Mahon's remarks in Section III of his report as to the probable necessity of mixing an 'aluminous iron ore with 'the quartzose magnetic 'of Kanjamalai ore' are of 'too general and vague 'a character for him 'to take the responsibi- 'lity of advising the Board 'as to the selection of any 'particular aluminous iron 'ore for such a purpose, 'and that it would be much 'simpler if Major Mahon's 'opinion were asked in the 'matter as originally pro- 'posed by the Board of 'Revenue' and as was actu- -ally done before in letter No 222 of 31.3.97.

M

G

Mr. Middlemiss also points

points out another difficulty in his way by referring to the fact that when Major Graham recommended the use of aluminious ore for mixing with the Kanjamalai ore, the latter was estimated to contain 67.76 per cent of iron, while Mr Middlemiss is convinced from his recent examination of the Kanjamalai hill, that the average yield of iron is not likely to exceed 40 per cent and that the richness of the ore had been much over estimated before.

The Board of Revenue submits Mr Middlemiss's letter to Govt saying that it is not in a position to offer any remarks on the question.

For orders as to whether the Govt of India may be addressed as proposed in the Office

Table attached [illegible]

office draft flagged H, the difficulties now raised by Mr Middlemiss being also pointed out.

MK
23/2/98.

Secy

The Govt of India might be asked with reference to Mr Middlemiss's report to obtain a more definite & detailed report from Major Graham of the nature of the difficulty he anticipates in smelting the Salem ore and of the aluminious ore he thinks it most desirable to send. [~~A draft is submitted herein~~]

Attd
24/2/98

1 Both as previously noted (under G.O. No 247 dated 13-2-98) the Govt of India apparently simply wants us to say what aluminous ore exists nearest to the Salem iron fields. I submit

therefore that the Board may be asked to call on Mr Middlemiss to report on this point without reference to the question whether the admixture of this ore with the Salem ore is necessary or not.

24/2/98 Bellenden Klein

~~Dept. concerned~~ Mahon

8/4-24/4/98

Please see draft order overleaf.
ELK
24/4/98.

in reference to Mr Middlemiss enquiry

Seen

Major Mahon (vide page 11 of W.P. No 24 of 19 January) points out that the working of hematite ores in the blasting furnace presents considerable difficulties due chiefly to the want of alumina in the ore. He suggests therefore that magnetite of Salem should have aluminous ore mixed with it & anticipates no difficulty in getting it.

As noted by Mr Stokes at the time, the question is whether suitable aluminous ore can be got near the Salem beds & where, apparently any kind of aluminous ore would do. The ore to be sent should clearly be one which would easily available to iron works at Salem & the question is, are there such ores!

Perhaps may I submit I asked to report in connection

14/
16/4/98

marginal notes on page 11 of W.P. No 228 21/2/98

write Mr Middlemiss a letter, if the Director of Ind. Intel. has not sent them away to Govt, Mr Holland.

Ille
11.3.98

Yes. I have altered the office draft, which may issue as revised.

S.H. 12-1-8

Dft sharp
Ille 10/3/98

Hw

Read again G.O. 980-1
25-2.98
C.R.O. 1829 of 1898

Draft Press.
G.O. No. 1440 of 10th March 1898.

Major Mahon's letter read above will be Communicated to the Board of Revenue. ~~and to Mr Middlemiss.~~

2. The Board is requested to report after enquiry whether Mr. Middlemiss ~~will be requested to report if~~ alaminous ore of the description given in para 4 of Major Mahon's letter is available near the Salem riverbeds or anywhere else in this Presidency.

3. The following letter will be despatched to the Govt of India.

Ille
S.H.
9/3

DS
10/3/98

To the Board of Rev (L.R.).
Dr Ltr 7.5.98 Ille 10/3/98
52/2

~~To Mr Middlemiss Sogr~~

Note for the Despr

Please send copy of Major Mahon's letter to Govt of India

Mr. Mahon C 9/3/98

Letter No. 145

To the Secretary to the Govt of India
Public Works Dept

Sir,

Sir,

In reply to Mr. Lees' letter dated the 30th November 1897 No 63C and in continuation of endorsement ~~No 980A~~ of this Department No 980A. dated the 25th February 1898. regarding the description of aluminous ~~Indian~~ ore ~~which it may be most desirable~~ to be sent to England ~~from for being smelted~~ with the Salem iron ore, I am directed to forward a copy of Major Mahon's letter dated the 18th March 1898, ~~reply~~ from which it would appear that he has since explained to the Govt of India that it is unnecessary for the purposes of the present experiments to obtain and send any aluminous ore to England.

2. ~~The Middlemiss of the~~ Mining is however ~~Geological Survey Depart.~~ being made or ~~ment has however been~~ whether ~~requested to report if~~ aluminous ore answering ~~to~~ the description given in para 4 of Major Mahon's letter is known to be found ~~can be, has been~~ near the Salem beds or anywhere else in this Presidency.

2 to 2

Westminster 11/3/98

S. in Go 247 17-1-98

Z. in Go 980 25-2-98.

JG 9/3/98

Mc 9/3/98

Mc 8/3/98.

Printed Copy of this letter despatched on 15-4-98

20/2

Government {1898} of Madras.

REVENUE.

Recd. } 1898. *Enclosures*

Regd. } *Spare copies*

G.O., No. 144, 10th March 1898.

MARCH.

Aluminous ore

Communicating to the Board of Revenue letter from Major R. H. Mahon, R.A., of Cossipore; requesting it to report, after consulting Mr. Middlemiss, whether — of certain description is available in this Presidency, and addressing the Government of India on the above subject.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—again the following G.O., Mis. Nos. 980–81, Revenue, dated 25th February 1898 :—

Read—the following Proceedings of the Board of Revenue (Land Revenue), Mis. No. 507, dated 21st February 1898 :—

Read—again the following G.O., Mis. No. 247, Revenue, dated 17th January 1898 :—

Read—also the following letter from O. C. LEES, Esq., Under Secretary to the Government of India, Public Works Department, Civil Works, to the Secretary to the Government of Madras, Revenue Department, dated Calcutta, the 30th November 1897, No. 63-C. & I. :—

In continuation of this office letter No. 52 C. & I., dated the 6th November 1897, I am directed to state that the Government of India contemplate sending a consignment of 300 tons of Salem iron ore and 600 tons of Bengal coal for trial to Messrs. Bolchow, Vaughan and Company on receipt of a report from that Company on the results obtained from the trial of the 2 tons of Salem ore and 5 tons of Sanctoria coal referred to in the above quoted letter. I am to request therefore that the Government of India may be furnished with the views of the Government of Madras as to what aluminous Indian ore it may be most desirable to send at the same time for the purpose of mixing with the Salem ore—*vide* section III of Major Mahon's report on the manufacture of iron and steel in India, a copy of which accompanied Government of India Revenue and Agricultural Department letter No. 4371–36–9, dated the 3rd December 1896.

Order—Mis. No. 247, Revenue, dated 17th January 1898.

Communicated to the Board of Revenue in continuation of G.O., No. 1007, dated the 3rd December 1897, for report in communication with Mr. Middlemiss of the Geological Survey.

(True Extract.)

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

To the Board of Revenue (Land Revenue).

Reference on the above, dated 21st January 1898.

Mr. Middlemiss will be requested to furnish the Board with his views on the above question, in order that the required report may be submitted to Government.

Read—the following letter from C. S. MIDDLEMISS, Esq., Superintendent, Geological Survey of India, to the Secretary to the Commissioners of Land Revenue, dated Udumalpet, 6th February 1898 :—

I have the honour to acknowledge your reference (dated 21st January 1898), to G.O., Mis. No. 247, Revenue, dated 17th January 1898, and to say that as I have not Major Mahon's report with me in camp, I am unable to make an immediate reply. By the end of this month I shall be able to refer to the matter, though the question appears to be a little outside the sphere of the geologist.

I return the Government Order in original.

Endorsement of the Secretary to the Commissioner of Revenue Settlement, Land Records and Agriculture, dated 9th February 1898.

Transferred to the Land Revenue Department.

Reference on the above, No. 157, dated 12th February 1898.

A copy of G.O., No. 221, dated 30th March 1897, containing Major Mahon's report on the manufacture of iron and steel in India is herewith forwarded to Mr. Middlemiss with the request that the opinion asked for in Board's Reference on Government Register No. 88 of 1898, dated 21st January 1898, may be furnished at an early date.

Read—the following letter from C. S. MIDDLEMISS, Esq., Superintendent, Geological Survey of India, to the Secretary to the Commissioners of Land Revenue, dated Coimbatore, 17th February 1898 :—

In replying to the Board's communication (Reference No. 157, dated 12th February 1898), I have the honour to say that, having read the report by Major Mahon, R.A., "on the manufacture of iron and steel in India," I find the remarks in section 3 of that report, referring to the probable necessity of mixing an aluminous iron ore with the quartzose magnetite ore of Kanjamallai, to be of too general and vague a character for me to take the responsibility of advising the Board as to the selection of any particular aluminous iron ore for such a purpose. It is not stated in that report *what* the difficulty is that has to be overcome, a slag that is "difficult to deal with" makes no picture in my mind sufficiently concrete for me to found any opinion whatever upon. I think it would be much simpler if Major Mahon's opinion were asked in the matter, as proposed in the Board's Resolution (No. 24 of 19th January 1897, paragraph 12).

A further difficulty in the way of my recommending any suitable ore for mixing as proposed is that my recent geological examination of Kanjamallai for the purpose of getting out two tons of the quartz-magnetite rock for despatch to England for trial purposes has convinced me that the richness of the ore has been much overstated (see copy of my report on the matter to the Director, Geological Survey of India, sent with my letter, dated 6th February 1898, to the Government of Madras).

I regret, therefore, that I am unable to suggest to the Board what kind of aluminous iron ore Major Mahon had in view when he recommended its use for mixing with a quality of Kanjamallai ore, which I do not find to exist.

Resolution—Mis. No. 507, dated 21st February 1898.

The reports received from Mr. Middlemiss on the question of the selection of an aluminous Indian ore, to be mixed with the Salem ore, are submitted to Government with reference to its order first read above.

2. The Board is not in a position to offer any remarks on this question.

(True Copies and Extract.)

(Signed) R. C. C. CARR,
Secretary.

To the Secretary to Government, Revenue Department.

Order—Mis. No. 980, Revenue, dated 25th February 1898.

In view of the difficulties pointed out by Mr. Middlemiss in his letter embodied in the Proceedings of the Board of Revenue read above, Major Mahon will be requested to favour this Government, at an early date, with his opinion on the subject.

(True Extract.)

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

Copy the Board of Revenue (Land Revenue).

Endorsement No. 980-A.

Copy to the Government of India, Public Works Department.

(Signed) N. E. MARJORIBANKS,
25th February 1898. Ag. Under Secy. to Government.

Letter—from the Hon'ble Mr. G. S. FORBES, I.C.S., Acting Secretary to the Government of Madras, to Major R. H. MAHON, R.A., Superintendent, Foundry and Shell Factory, Cossipore, dated 25th February 1898, No. 981.

With reference to your remarks in section 3 of your report on the manufacture of iron and steel in India, dated the 5th May 1894, I am directed to request you will be good enough to favour this Government, at an early date, with your opinion as to the aluminous iron ore which it may be most desirable to send home for the purpose of being mixed with the Salem ore. Mr. Middlemiss of the Geological Survey Department, who is now working in this Presidency, was consulted on the subject, but he has expressed his inability to offer any advice in the matter for the reasons given in his letter embodied in Board's Proceedings, No. 507, dated 21st February 1898, of which a copy is herewith enclosed. This Government will be much obliged by any information which will remove his difficulties.

Read—also the following letter from Major R. H. MAHON, R.A., Superintendent, Foundry and Shell Factory, Cassipore, to the Secretary to the Government of Madras, Revenue Department, dated Cossipore, 1st March 1898, No. 6554—III-C. :—

I have the honour, in reply to your No. 981, dated 25th February 1898, to state —

The report contained in the Revenue paper No. 92 of 1898 by Mr. C. S. Middlemiss is undoubtedly disappointing and completely reverses all the published statements concerning the richness of the Salem iron beds previously published, the statements at pages 335 and 348 of Ball's Economic Geology. The report of Messrs. King and Foote published in Volume IV of the Geological Memoirs, the hand-book of the Imperial Institute relating to iron and many other statements and publications have all hitherto gone to show that inexhaustible beds of magnetite with a richness of about 60 per cent. iron exist in the neighbourhood of Salem and principally in the Kanjamallai Hill. If the present report is accepted as final, the content of iron must now be set down at 40 per cent. and the whole conception of an iron industry radically altered. I have unfortunately not now available for reference the various books and notes which I have collected on the subject, but to the best of my recollection even Mr. Head's adverse report counted on a 60 per cent. ore—if this be reduced to 40 per cent., the situation would become still more difficult.

2. Referring to the question of an aluminous ore, I have the honour to state that in a subsequent communication to the Government of India, which is presumably to be found among the papers, I explained that, however desirable an admixture of aluminous ore might be with a magnetite such as that stated to be available at Kanjamallai for general manufacture, the same was not a necessity for purposes of experiment, and I suggested that for the present investigation no necessity existed for this class of ore to be obtained.

3. To complete the subject however and to reply to the present enquiry it may be stated that the Kanjamallai ore has always been supposed to be generally similar in its nature to that used in Lancashire and Cumberland, a rich ore of which the principal impurity is silica, and with this ore it has been found desirable to make an admixture of aluminous ores for the purpose of producing a more fusible slag. The following statement may clear the matter. It is extracted from Jean's work on steel (page 359).

In this ore (the west coast of England is referred to) the principal impurity is silica and unlike the Clereland and most other ores it does not contain any aluminia. It is therefore thought desirable at many places to mix it with aluminous ores for the purpose of producing a better slag and also in order to obtain greater regularity in the working of the furnace. The addition of these aluminous ores also gives the means of controlling in some measure the percentage of silica in the iron.

4. Later on Mr. Jeans gives the analysis of the most suitable aluminous ore as under :—

Silica	6 per cent.
Alumina	20·37 ,,
Peroxide of iron	71·63 ,,
Water in combination	1·15 ,,

If the proposition to send aluminous ore is adhered to such an ore as described might be sent (if available), but I consider this unnecessary at the present stage.

Order—No. 144, Revenue, dated 10th March 1898.

Miscellaneous.

Major Mahon's letter read above will be communicated to the Board of Revenue.

2. The Board is requested to report, after consulting Mr. Middlemiss, whether aluminous ore of the description given in paragraph 4 of Major Mahon's letter is available near the Salem iron-beds or anywhere else in this Presidency.

3. The following letter will be despatched to the Government of India.

(True Extract.)

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

To the Board of Revenue (Land Revenue).

Ed. Shaik Karim.

50 Copies.

1898.

PUBLIC WORKS DEPARTMENT.

From *The Government of Fort St. George.*

Recd. 1898. *Enclosures*

Regd. *Spare copies*

Letter, No. 145, 10th March 1898.

MARCH.

Forwarding to the Government of India a copy of Major Mahon's letter regarding the selection of aluminous ore to be mixed with the Salem iron ore.

REVENUE DEPARTMENT.

From

THE HON'BLE MR. G. S. FORBES, I.C.S.,
Acting Secretary to the Government of Madras,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
PUBLIC WORKS DEPARTMENT.

Dated Fort St. George, 10th March 1898.

SIR,

In reply to Mr. Lees' letter, dated the 30th November 1897, No. 63-C., and in continuation of endorsement of this department No. 980-A., dated the 25th February 1898, regarding the description of aluminous ore to be sent to England with the Salem iron ore, I am directed to forward a copy of Major Mahon's letter, dated the 1st March 1898, from which it would appear that he has since explained to the Government of India that it is unnecessary for the purposes of the present experiments to obtain and send any aluminous ore to England.

Miscellaneous.

2. Enquiry is, however, being made as to whether aluminous ore of the description given in paragraph 4 of Major Mahon's letter is known to be found near the Salem beds or anywhere else in this Presidency.

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

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

Exd. Shaik Karim.

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[illegible] Government

Endorsement with Bills.

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