Reference (1897) Department.

PRESS SERIES.

G.C., Nos 846-847

Dated 6th October

[Despatch Abstract.]

Passing orders on the question of the continuance of the investigation of the corundum areas of Salem Vaccination, the investigation of Kunnoor area, & the inspection of mica mines in Nellore.

II

G.O. 846-47 Rev

6-10-1897.

Revenue (1897) Department.

D. C.

CURRENT No. 1624

From J. Sturrock, Esq.,
Madras.

Order

No.

Dated 27th May 1897

Received 2.6.97

Registered

Enclosures

Spare copies

SUBJECT.

Reg. the investigation of the iron ores of Kurnool

3,006
10-12-96.

BACK PAPERS.

G.O.	No.	Department.	Date

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Revenue (1897) Department.

CURRENT No. 1414

GOVERNMENT OF MADRAS
26 MAY 97

480—2-2-97.

Revenue Board Office,
(Land Revenue),
MADRAS, 24th May 1897.

GOVERNMENT OF MADRAS
19 MAY 97

The Board of Revenue, Land Revenue, Madras.

No. 1836 Misc.

My dear Sirkes,

If Middlemiss has not written to you direct, you will have seen from B.P. 1926 19-5-97 that Oldham has told Middlemiss he cannot go to Kurnool about the Iron ores. This B.P. was sent as returned and despatched in my absence - or I should have suggested that the Govt of India

ted 19th May 1897.
ceived 26.5.97
egistered 27.5.97
nclosures
are copies

SUBJECT.

Recording; letter from the Superintendent Geological Survey of India forwarding copy of letter from the Director, Geological Survey of India regarding Kurnool iron-ores.

BACK PAPERS.

G.O.	No.	Department.	Date

Revenue (189 7) Department.

CURRENT No. 1414

GOVERNMENT OF MADRAS
26 MAY 97

The Board of Revenue, Londonnue, Madras.

No. 1836 Misc.

19th May 1897.

ved 26.5.97
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e copies

SUBJECT.

Recording letter from the Superintendent Geological Survey of India forwarding copy of letter from the Director, Geological Survey of India regarding Kurnool iron ores.

Should be addressed.

In his Administration report Oldham committed himself to the view that after perusal of Heads report further investigation of Indian ores was waste of time. If newspaper reports are correct Chief of Govt of India thereon told him that the matter was still under investigation - but however that may be the Govt of Madras persons going on with experiments - and if Indian ores is to be worked up with Barrakur coal it is important that ores supposed to be valuable wherever the coal field there valuable - should be equally thoroughly examined.

Yours sincerely

J Hallock

BACK PAPERS.

G.O.	No.	Department.	Date

Revenue (1897) Department.

CURRENT No. 1414

GOVERNMENT OF MADRAS
26 MAY 97

From

The Board of Revenue, Land Revenue, Madras.

Order

No. 1836 Misc.

Recorded
13.9.97

Dated 19th May 1897.
Received 26.5.97
Registered 27.5.97
Enclosures
Spare copies

SUBJECT.

Recording Letter from the Superintendent Geological Survey of India forwarding copy of letter from the Director, Geological Survey of India regarding Kurnool iron-ores.

3,006
10-12-96.

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

REVENUE BOARD OFFICE. MADRAS.

Proceedings of the Board of Revenue

(Land Revenue)

No.1836 Misc.,dated 19th May 1897.

Read the following :-

Office of the Superintendent
Geological Survey of India

No. 25 S
E

From

C.S.Middlemiss Esquire,B.A.,
Superintendent,Geological Survey
of India, Ootacamund.

To

The Secretary to the Commissioner
Board of Revenue,Madras.

Dated 10th May 1897.

Sir,

In continuation of my No.11/R.S. of 24th April 1897,I have the honor to append a copy of the letter from the Officiating Director Geological Survey of India for your information and guidance.

I have the honor to be
Sir,
Your most obedient servant,
/signed/ C.S.Middlemiss
Superintendent.

-------:0:-------

No. 337

From

R.D.Oldham Esquire,

Officiating Director,Geological

Survey of India.

To

C.S.Middlemiss,Esquire,

Superintendent,Geological

Survey of India.

Dated Calcutta 5th May 1897.

Sir,

In acknowledging receipt of your No.12/R.S. of the 25th April,I have the honor to point out to you that your action in entering into correspondence with the Government of Madras on a subject regarding which you have not been put in communication with them,and in expressing your opinion to them on a matter which involves a change in the sanctioned and proposed programmes of work of the Department is irregular and inconvenient.

2. As regards your present application for permission to spend from two weeks to a month in the investigation of the Kurnool iron-ores during the next working season,I have to inform you that Icannot find in the papers before me any reason for modifying my previously expressed opinion that it would be inadvisable to interrupt the work you are at present engaged on and am consequently unable to sanction your proposal.

3. For your future guidance,I have to request that you will be good enough to immediately refer to this office,without entering into further correspondence on the subject,any demand made on you by the Government of Madras, which would in any way interrupt the work on which you or any member of the Department placed under your control are engaged under the instructions or with the approval of this office.

4. This instruction should not,however,be interpreted as prohibiting you from rendering the Government of Madras all assistance in your power,by affording them information or advice on any question they may submit to you,so far as this can be

I have the honor to be

Sir,

Your most obedient servant,

/signed/ R.D.Oldham

Officiating Director,Geological

Survey of India.

/True Copy/

/signed C.S.Middlemiss

Superintendent,Geological

Survey of India.

-------:0:-------

Resolution

Recorded.

(True Copies & Extract)

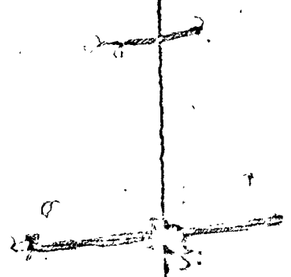
Secretary.

To

The Secretary to Government,Revenue Department,with reference to its order No.2387 Mis.,dated 12-5-97.

Md.R.H.

12



13/

C. No. 4414 of 189.
& D.O. C. No. 104 of 18.

For orders.

At the instance of the Board of Revenue, (Land Revenue Dept.) Mr. Middlemiss, who ~~is now~~ was engaged in the mineralogical survey of Salem & Coimbatore, was requested in G.O. No 4864 dy 30.11.96 to pay a visit to the Kurnool District to collect specimens of the best iron Ores found there and to send them On to the Imperial Institute, London, for analysis. Mr. Middlemiss stated in reply that he would have to spend for the purpose from three to four weeks in Kurnool, and that he would go there in Feby. ~~next~~. On the 25th March however, Mr Middlemiss addressed a letter to Govt in which he said that he "opportunely offered ~~himself~~ "during the past Cold weather "field season, of visiting Kurnool

Kurnool' and that ~~T~~ ~~xxxx~~
'~~xxxxxxxxxxxxxxxxxx~~
'~~xxxxxxxxxxxxxx~~'. as Kur-
'nool is outside the Distriets
'of Salem and Coimbatore
'with which the geological
'Survey is now particularly
'engaged and as the Director
'has expressed himself
'as deprecating any inves
'tigation of those ores.
'until the Question of the
'Salem iron ores is settled,
'such a proceeding would
'have been unadvisable'.
The Board of Revenue. to which
the above letter was Com.
municated, thereupon pointed
out to Mr Middleniss
the importance of the early investi
gation of the Kurnool iron
ores. and also drew his
attention to the fact that
the Govt of India did not
accept the Director's view
that ~~the~~ such investigation
was a waste of time.
Mr. Middleniss then
agreed with the Board of
Revenue and stated that

In para 2 of Govt letter dated 15th July 1903 in Memorial volume pp. 1 & 2.

Cross reference to para 3 of Resolution dated 27th August 1903 Page 5 E

Page 51 D1

that, subject to the sanction
of the Director, he would
arrange to visit the Kurnool
District by the 15th June.
The Director, however, both
Mr. Middleniss applied
for permission, has now
taken him to task for hav.
ing entered into correspond.
ence with this Govt regard
ing the investigation of the
Kurnool iron ores, and
for having
expressed his opinion on a
matter which involves
a change in the sanctioned
and proposed programme
of work of the Depart.
ment. Mr Oldham,
has declined to accord
sanction to Mr Middleniss
paying a visit to Kurnool.
on the ground that it would
be unadvisable to interrupt
the work in which he is
at present engaged.
In his D.O. read above.
the Hon'ble Mr Sturrock
suggests ~~xxxxx~~ that the
Govt of India should be
addressed ~~xxxxxxxx~~ in the

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the Matter, so that Mr Oldham may be directed to send Mr Middlemiss to Kurnool.

In the C to G 391/97, the Board of Revenue in the Settlement Dept. has brought to the notice of Govt the fact that Mr Middlemiss would not go to Kurnool Nellore to inspect the mica mines there without the Director's sanction. In that Current the Secretary has remarked that if we cannot take Mr Middlemiss away from the Corundum investigation of Salem & Coimbatore, until we know the Board's Opinion as to the desirability or otherwise of the Continuance of such investigation. The Director has asked this Govt what its wishes are in the matter and when giving him a reply on receipt of the Board's views, it is thought that the question of deputing Mr Middlemiss for the inspection of

* Please see file beneath
Minutes of the Madras
Govt copy with
Corundum
[illegible]

17

of the mica mines of Nellore and the investigation of the Kurnool iron ores may be considered. I submit that the Bd's report on the advisability of continuing the corundum investigations might awaited before taking decision action in the matter. The amended draft G.O. embodied with the Mem current calls for this report.

Mly
2.6.97

Yes. It is plain that with this Dept. nor the Dr. can send any of the Geological Survey Staff away from the work the Director puts them to. This Mr's Mem. should be considered. and he should always be addressed.

See Mr
9.6.97

Mr
9/6

18

STOR. GOVT. MADRAS
27 JUN 97
REV. DEPT.

17

Revenue (189 7) Department.

CURRENT No. 5338

Received the Dispatch
Sealed from Mr. Co 2/60
29.6.97.

Secy fro.

From

The Board of Revenue, Land Revenue, Madras.

Order

The Govt consider that it would be unnecessary to depute Mr Middlemiss for the purpose in view. 2. Should the Govt of India approve of the proposal to send 500 tons of the Kanjamalai ore to Messrs Nelson Vaughan & Co, the work of blasting out the quantity required with a Subordinate of the P.W.D. Subordinate.

15/9/97

No. 2275 Misc.

25 ditto

Dated 25rd June 1897.

Received 27.6.97

Registered 28.6.97

Enclosures

Spare copies

SUBJECT.

Submitting to Govt. Salem Collector's report regarding collection & transport of 500 tons of Kanjamalai Iron ore & recommending that Mr. Middlemiss may be deputed to visit the locality & point out the kind of ore required & the place where it can be most conveniently obtained.

R.? 28/6.

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BACK PAPERS.

G.O.	No.	Department.	Date.
	221	Rev	30.3.97

FURTHER PAPERS.

G.O.	No.	Department.	Date.

2000—11-7-94.

21

Salem Collector's Office,
16th June 1897.

No. 3154 Despatched 17-6-97.

From C. H. Mocniccy
~~G. STOKES~~ Esq.,
a/c Collr. & Dist. Magte. of Salem.

To

The Secretary to the
Commissioner of Land Revenue
Madras

SIR,

I have the honour to reply to Boards' Proceedings of the 5th May 1897 No. 1604, mis, in which I was asked to submit an Estimate of the Cost of collecting and placing on Railway trucks 300 tons of Kanjamalai Iron ore and to state the time in which it can be done.

2. The Salem District Manual Vol I pages 98 & 99 describe the Iron ore beds and the Cost of extracting:- but I find that it is neither so simple or so cheap a process as a perusal of the manual suggests.

3. The manual says that the Magnetic Iron ore beds are disposed in a concentric ellipse around the Kanjamalai hill. "Three principal iron beds occur here and may be traced with ease in most parts all round the Ellipse". The average thickness of the two lower

and

and principal iron beds may be set down as about 50 feet or — possibly rather more. A great talus of iron stone fragments extends all round the hill but is specially noticeable on the south side where the fields are thickly strewn with it for a distance of more than a mile from the foot of the hill. In richness ~~thickness~~ the beds are not constant throughout but vary gradually from a rock which to the eye would appear to consist of ore to the extent of seven parts to eight to one containing about half its bulk of ~~iron~~ ore. "The iron beds show very conspicuously on the flanks of the hills in quasi-terraces." "Two kinds of workings were in vogue (in 1861) for collecting the ore. The first was to turn up the talus or highly weathered outcrops of the beds by shallow trenches or holes ..... and thence to collect the smallest and most friable pieces which if not already sufficiently comminuted were further reduced by pounding --- to the consistency of a coarse sand. The second kind of workings was by means of rude attempts at shafts ..... The cost of collecting and picking for the furnaces was about 1¼ rupees per ton."

4. From the above it would appear that in regard to collecting the ore

ore the only thing to do would be to go to the hill, pick out by the eye the lowest iron ore bed, select some place where the ore was of a good average quality, quarry it and cart it to the station.

5. The original estimate I obtained for this was, as I reported in my letter No. 645 dated 6th June 1897, Rs 1,750, and this estimate I have had checked by the Executive Engineer who reports that it is pretty accurate. I enclose a copy of it. It will be observed however from the Estimate that the cost of digging and picking the ore is about Rs 3⅓ per ton whereas the ~~District~~ manual says the cost is about Rs 1¼ per ton. I went out to Kanja malai to inspect myself. I found the method of collecting the ore intended to be adopted & was the first of the methods described in the District manual – the Sub Divisional Officer's letter, copy of which I enclose, explains what was being done. I found the Sub divisional officer present on my visit. We tried to find out from the descendants of old workers, who were also present, where the ore was obtainable

Features in 1861 temporary workings

obtainable, but did not succeed though traces of a few pits were discernible and the large levelled space where iron ore was stored by the Portonovo Iron Company previous to carting it away was pointed out.

6. Again the District Manual says that the iron beds show very conspicuously on the flanks of the hills in grass-terraces. This may be so even now to the eye of a Geologist, but either from the growth of jungle, the washing down of debris or my own ignorance neither I (nor the District Forest Officer who was with me could trace them out. To obtain the ore as it is proposed to obtain it, an immense amount of labour is involved and the time required to get 300 tons will be very prolonged. I believe the System is one merely to obtain the iron when in the Cubical and octohedral forms some few of which we did find in the trial pits. I would respectfully suggest that a Geologist (I have heard that Mr Middlemiss is likely to be in Salem shortly) be deputed to select the ore to be excavated and that the excavation be carried out under professional supervision.

7. There

7. There is another difficulty that may arise. Ariyanur Railway Station is nearest the iron ore but this station has no second line of rails - so I dont quite see how the lading of trucks can be easily be carried out. Though this station is only about a mile from the supposed site of the ore - owing to the thickly strewn rocks between the ore and the station, carts cannot go direct - I had even some difficulty in riding it - and must go some 2½ miles in all.

8. I regret that my report must appear so inconclusive in that I cannot forward any reliable estimate as called for, for the reasons I have given above.

I have the honour to be
Sir
Your Most obedient Servant
C Mowney
Asst Metn

Fwd 16.6.97

16/6/97

Vo

V./ Subdivision Office.
Salem 14th June 1896

No. 449

From
M R Ry
L Raghava Ayangar Asst
Subdivisional Officer
Salem Sub-Dv.

To
The Executive Engineer
Salem

Sir

With reference to your verbal orders to inspect and report upon the cost of collecting iron ore from the Kanjamalai hills, I beg to report that on examining in four places where, it is said that iron ore could be got; no appreciable quantity was obtained. One has got to excavate pit after pit to find out the ore and no one is able to say exactly where the stuff can be got.

From the four pits ($2\frac{3}{4}' \times 2\frac{1}{2}' \times 2$), ($2' \times 2' \times 1\frac{3}{4}'$), ($3' \times 3' \times 1\frac{1}{2}'$), ($2' \times 2' \times 1\frac{1}{2}'$) excavated and by sifting the dug up soil; about 0·43 C.feet of iron ore was obtained and of this quantity nearly 50 percent will have to be rejected containing earth and other matters. Consequently the net quantity of iron ore will be only 0·06 C.ft.

The

3. The soil though generally gravelly is mixed up with red earth and the cost of excavation of this description of soil is about 1/20 anna per cubic yard. At this rate the value of ore obtained this morning (.06 cft) is 0-2-3 or Rs 2-5-6 per cubic foot which is exorbitant. The ore is small nodular (herewith) which alone the people near the hills are accustomed to collect.

4. The hills abound with a lot of stones big and small which appear to contain iron ore (samples herewith). Probably by the collection of these stones the Board of Revenue refers and the matter should be referred to the Geological department for selection

5. I was not able to gather reliable information as to the place wherein ore can be got abundantly as from the unsatisfactory result obtained from my examination this morning, it is difficult to say in what time 300 tons of ore can be gathered. However I may roughly say that if 200 men were put at the quarry it will take about 10 months to collect 300 tons

of

of nodular ore. But in case stones containing iron ore are to be collected and transhipped, about 2 months time will suffice.

Sd/ Hegde

4th Raghawa Regt

Subdn Officer

Endorsement No 468/m dd 15.6.97

Forwarded to the Collector of Salem with reference to this Ref No 645/849 dated 6.6.97. It would be impossible to gather 300 tons of ore by the 27th inst. and from enquiries made it would appear that at least 3 months would be required. Matters might be facilitated if the Geological department could point out exactly where to excavate. The estimate is as far as can be ascertained pretty correct.

Sd/ H. O'Connell 14.6.97

(True copy)

C.H. Nemmy

For Asst Collector

Fwd 16.6.97 16/6/97

Estimate showing the Cost of Collecting and placing on Railway trucks, 300 tons of Kanjamalai iron ore

No.	Particulars	Amount		Remarks
	300 tons are equivalent to 300×28×4×20 = 6,72,000 lbs or $\frac{6,72000}{24}$ maunds = 28000 mds taking 3 carts for one ton of weight, the weight of a cart of ore will be 31 1/9 mds. The No. of carts required for carrying 300 tons is = 900. The distance to be travelled is (Vide Sketch appended) about 4 miles of which 3 miles are a bed rock - a great portion of it being full of stones. The Cart hire therefore may be put down at 10 as per Cart;			
	at this rate the hire of 900 carts is	562	8 0	
	The digging and picking of the metal per ton at 93 1/3 mds is Rs 3-66 (at 7 hrs per maund)			
	Therefore for 300 tons or 28000 mds	1021	12 4 14 0	
	Loading the truck at the rate of Rs 5 for every 10 tons or 8 as a ton	150	..	
	Sundries for repairing the road &c	15	10 0	
	Total Rs	1750	..	

Rupees One thousand seven hundred and fifty only

sd/ R. Govindaraja Aiyangar
Valuer

Accountant
for Asst Director

Accd/ 16.6.97

Accd/ 1696.

(Trucks)

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8,000
10-12-96.

Proceedings of the Board of Revenue

(Land Revenue).

No.2275 Misc.,dated 25rd June 1897.

Read letter from C.H.Hounsey,Esquire,Ag.Collector and District Magistrate of Salem,No.3154,dated 16th June 1897 to the Secretary to the Commissioners of Land Revenue,Madras

--------:O:------

Resolution

Submitted to Government with reference to its order dated 30th March 1897,No.221.

2. In the circumstances reported by the Collector, the Board recommends that Mr.Middleniss may be deputed to visit the locality and point out the kind of ore required and the place where it can be most conveniently obtained.

(True Extract)

W Wardle
Ag.Secretary.

To

The Secretary to Government,Revenue Department,with Collector's report & 3 Enclosures in original to be returned.

Md.R.H.

189 .

Board of Revenue

(Land Revenue),

MADRAS.

To

Subject.

Revenue (1897) Department.

CURRENT No.



From

The Board of Revenue
Revenue Settlement,
Land Records & Agriculture

Order

No. 5078 Mis

Dated 9th July 1897

Received

Registered

Enclosures

Spare copies

SUBJECT.

Corundum

observing that the Salem
— cannot be extracted
by hand at a cost which
would admit of its being
sold at a profit.

37

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

(Sdt. 22—2,000—11-3 97.)

REVENUE BOARD OFFICE MADRAS

260

Proceedings of the Board of Revenue

(Revenue Settlement, Land Records and Agriculture),

Dated 9th July 1897.

No. 5078 mis!

READ ... again Endorsement from the Acting Secretary to Government, dated 29th April 1897 Ootacamund No. 2160 mis: Rev: and B^ds Proc^gs: 3550 mis 20.5.97 thereon requesting certain figures to report the [illegible] per cwt.

Read also the following letter from Messrs Arbuthnot & Co, Madras, dated 28th May 1897:—

In reply to your Memorandum No: 3550 Miscellaneous, dated 20th instant, re Carundum, we have the honor to inform you that there are 2 qualities, Viz! No. 1 & No. 2. The present market price of the former is Rs 4/ per cwt and of the latter Rs 2/ per cwt, delivered into godown here.

40

Resolution.

In returning the report forwarded with the endorsement read above, the Board begs to state that it learns from Messrs Arbathnot & Co that the market price of corundum of the best quality delivered into the godown at Madras, is Rs 4 per cwt.

In Mr. Middlemiss's experiment, the cost of 1 cwt was over Rs 19.

Making every allowance for extra expenses due to the small scale of the experiment, it would appear that the Salem corundum cannot be extracted by hand at a cost which would admit of its being sold at a profit.

(True copy & extract)

R. V. Ramaswami
Secretary

To,

The Secretary to Government.
Revenue Department.

Ed: VRe
10.7.97

Revenue (1897) Department.

CURRENT No. 5412

Order

From The Director,
Geological Survey of India
No. 594

Dated 6th July 1897
Received
Registered
Enclosures
Spare copies

SUBJECT.

Requesting to be furnished with a full statement of the desires of the Madras Govt. re Geological investigations

42

BACK PAPERS.

G.O.	No.	Department.	Date.
BP 1428		(LR)	14.4.97

FURTHER PAPERS.

G.O.	No.	Department.	Date.

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No. 594.

GOVT. OF MADRAS
13 JUL 97
REV. DEPT.

FROM

R. D. OLDHAM, Esq.,
Offg. Director, Geological Survey of India.

To

The Secretary to the Government of Madras,
Revenue Department.

Dated Calcutta, 6th July 1897.

SIR,

No 2387
12.8.97

I have received through Mr C.S. Middlemiss, Superintendent of the Geological Survey of India, a copy of the Proceedings and Resolution of the Board of Revenue, No 1428 Dis., dated 14th April 1897. With reference to which I would ask your consideration of the following.

2. The programme of work of the Officers of the Geological Survey of India is settled annually by the Government of India after consideration of the proposals made by the Director, and any serious change in it which may afterwards be desirable requires the sanction of the Government of India, which sanction would usually be granted on the

recommendation of the Director.

3. In these circumstances you will perceive that the course adopted by the Board of Revenue in communicating their desires to Mr. Middlemiss instead of to the Director of the Geological Survey must, to say the least, lead to delay.

4. In the present matter I am unable to recommend the diversion of Mr. Middlemiss from the work on which he is at present engaged, as I am at present unaware of precisely what is desired by your Government.

5. Should this be merely the collection of samples of iron ore, the work could be done through your revenue officials, but, if a detailed examination of the geological relations and mode of occurrence of the ores is required, this is an undertaking which will occupy a considerable part, at least, of a working season and will have to be provided for in the programme of work of the Department. I would consequently request that I may be favoured, at as early a date as possible, with a full statement of the desires of your Government and whatever information may have already been collected bearing on the matter you wish to be investigated.

6. I would, however, point out that Mr. Middlemiss has already on hand both the survey of the Salem and Coimbatore districts and the special investigation of their corundum resources, and would deprecate his transfer from there, unless for a matter of great importance and urgency. The investigation of the Kurnool iron ores may come under this designation, but, at present, in the absence of any special information, I would not be disposed to regard it as such. This is in no way due, as your Board of Revenue seems to consider, to Mr. Heads report, but to the fact that arrangements have been made for a trial shipment of ore from Salem to England. Whatever may be the result of this experiment, there can be no doubt that it will throw considerable light on the value of the ore and indirectly afford great assistance in any further investigations, and for this reason, if it be not outweighe

by others of which I have no knowledge, I would urge the postponement of further special investigations of iron ores in Madras till after the receipt of the report on the trial of the Salem Iron ores.

7. I would also request that, in all cases where your Government desires any special geological investigation, for which provision has not already been made, the application may, in the first instance, be made to this Office, and not to the Officer deputed to Madras. You will, at all times, find this Department ready to render you every possible assistance, but, as the disposition of the Officers of the Geological Survey is subject to the decision of the Government of India, you will find it more expeditious to communicate with me direct than through the Officer of the Geological Survey who happens to be working in Madras. When the carrying out of any special investigation is finally decided on, he will be placed in communication with you and the arrangement of details left to him.

8. As a further reason for

application being made direct to this Office, I would point out that experience shows that it is not infrequently possible to meet the desire of local governments for information on special subjects by a reference to the records of this Department without incurring the expense and delay of deputing an Officer to make a special investigation.

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

R D Oldham
Offg. Director, Geological Survey of India

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57

For C. No. the Under-Secretary.

MEMORANDUM.

book

REQUESTED for reference the under-mentioned papers:—

Selections from the Records of the Madras Government No. XXXII, Report of the Agricultural Exhibitions in the Provinces for the year 1855.

× From an old catalogue of books in the Chief Secretariat Library published in 1884, I find that the "Report on Exhibitions in the Provinces for 1855" bears the number XXXII A (vide page 152 of the catalogue)

GOVERNMENT OFFICE,
Revenue Department,
23rd Jan 1897.

To

The Librarian,
Chief Secretariat.

Selections XXXII A for the year 1855.

for book search

Yes. R. Sivaramapantulu 23/1/97 Registrar
Head clerk.
Rec'd

+ Returned by the Rev.

Ooty office. 53/

I have searched for the book in the Rev. Library once more. No copy of the report for 1855 is forthcoming. I therefore send in a requisition to the Chief Secretariat Library and the reply is herewith forwarded. The book put up is the same as the one returned with the note under reply viz. (Selections etc. ... 1856).

Re. the practical investigation of the Corundum areas of Salem & Coimbatore

The Hon'ble Mr J. Grose C.I.E.

Madras Ooty office. Lib'n 53/

Sent with reference to item 1 of the Ooty list of the 17th instant. It appears that the year has been by mistake put down as 1855 instead of 1856 in the Catalogue of books in the Rev. Secretariat Library. It is presumed that this is the book wanted.

There is no mistake in the Catalogue. The report wanted is that for 1855 and not the one for 1856. I have got them the reports of both 1856 & 1857. Please make a search once more in the Rev. Library & if this

F.P.K. 19.8.97

Read again G.O.s 2586 20.5.97 & 2816 3.6.97
also C. Nos. 4414/97.
Do. C.No 1040 of 97
& C.No.s 5338, 5861 & 5912 of 97.

For orders.

In the papers read above, two questions are raised for consideration. (1) whether the Supdt, Geological Survey, Mr Middlemiss, who is now engaged in the practical investigations of the Corundum areas of Salem should be asked to continue his operations. & (2) whether the Director, Geological Survey of India, should be addressed in view to Mr Middlemiss being deputed to Vellore, Kurnool and Salem for the inspection of the Mica Mines in the former Districts and for collecting samples of iron ores in the other two Districts to be tested here for experimental purposes.

In connection with the firing question, it may perhaps be desirable to take a retrospective view of the circumstances under which Mr. Middlemiss was

48/

52/

is not forthcoming, obtain a copy from the Chief Secrett. lib'y & send copy. Ulwar & Bhart. From an old catalogue of books in the Chief's library, published in 1884, I find that the 'Report on Exhibitions in the Provinces for 1855' XXXII A' bears the number 158 & is in al. mirah No 2 (vide page 152 of the book catalogue) Please send the copy shown. The U.S. wants it urgently. 6th 2/18

52/

R. the practical investigation of the Corundum areas of Salem & Coimbatore

The Hon'ble Mr J. Grose C.I.E.

49/

Note for the Under Secretary

The report in the Exhibitions of 1855 referred to by the Hon'ble member as stated to be forthcoming either in the Revenue or Public Dept Reports for 1855 & 1856 are available Library. I went thro' the Salem Dist. Manual to see if any mention is made therein regarding the prices of Corundum referred to by the Hon'ble member but in vain. In the page 38 of the Madras Manual of Administration Vol II, however there is some information re. the Manual. The local price in Salem & Bellary is stated to be about a Rupee per Cwt. In Kistna & Godavari, samples of red Corundum were considered to be worth from Rs 150 & Rs 200 per ton i.e 7½ Rs to 10 Rs per Cwt.

c 13/8/97

14/2/18.

was deputed to this Presidency and of the work on which he has been engaged since his arrival in November 1893.

The importance of carrying out a systematic mineralogical survey of this Presidency with a view to the discovery and allocation of those mineral products which would be likely to prove of economic value, was urged on the attention of the Govt of India by this Govt in June 1893, and sanction was solicited to the appointment of a skilled petrologist for the purpose, for a period of five years. The Govt of India declined to sanction the appointment but instructed the Director, Geological Survey, to depute one of his officers to this Presidency to conduct a 'practical enquiry.' Dr. King, the then Director thereupon selected Mr Middlemiss for the duty, recommended that he should be employed on

× Letter to India dt 26.6.93 no 564. flagged A3

Dr. King's letter printed in G.O. no 987 dt 16.11.93. flagged B3

on a careful study of the crystalline & transition rocks with which the more important minerals of this Presidency are associated, and suggested that he should commence work in the Salem District. Having full confidence in Mr. Middlemiss's ability to carry out the scheme of survey proposed, Dr King said that the former officer should not be hurried but must be left free to take up the country as he saw fit, conducting the work in constant and direct communication with himself. The Govt approved of the Director's proposals, and Mr. Middlemiss who was provided by this Govt from Provincial funds with a micro-section Cutter on Rs 25 & a native assistant on Rs. 50, was engaged in the mineralogical survey of Salem & Coimbatore during the years 1894 & 1895, the results of his enquiries being embodied in two his attention

× G.O. no 987 Rev dt 16.11.93. flagged B3

× G.O no 3065 dt 31.7.95 flagged C3
& G.O no 242 dt 20.1.96. flagged D3

1

to the investigation of the Corundum areas in the Salem & Coimbatore Districts & of the Chromite and other mineral deposits of the Chalk Hills in the former District. and that if possible, he should also inspect and report on, the mica-mining industry in the Vellore District. The Mr Lowrie Mr Chamier. son, however having subsequently resigned his appointment under the Govt of India, ~~the~~ to the ~~overall~~ scheme ~~that~~ the original plan had to be modified.

In September last, a Conference was held at the Govt office, at which the ~~members~~ marginally noted ~~were~~ present; and it was decided that the detailed investigation of the Corundum Areas should be entrusted to Mr Middlemiss himself, and that he should be given an upper subordinate of the P. W. Department to Superintend the blasting and quarrying operations. Funds (Rs 4000) were provided

G.O. No 3638 dt 11.9.96. flagged

× The Hon'ble Col. McLean Campbell R.
Secretary to Govt P. W. D.
R. D. Oldham Esq.
Director, Geological Survey of India
C. S. Middlemiss Esq.
Supt. Geological Survey of India
The Hon'ble Mr. A. T. Arundel.
Secretary to Govt Rev. Dept.

para 2 of Go. ~~3638~~ 3638
11.9.96
flagged H_3

Govt. letter in G.O. No 4803 dt 25.11.96
flagged J

Report flagged G_3
in Go. No 2166
29.4.97

provided for the purpose and ~~Mr~~. and it was thought desirable that operations should, for the time being, be confined to the Dharmapuri Taluk of the Salem District. The Govt of India, also, on the recommendation of the Director, Geological Survey, extended the period of Mr. Middlemiss's deputation in this Presidency till 1900 and ~~also~~ approved of the deputation of another officer of the Department, Mr Holland to work in conjunction with Mr Middlemiss for one season and then to undertake the survey of Coorg & S. Canara. Mr. Middlemiss was engaged in the practical investigation of the rocks near Palakod in the Dharmapuri Taluk from November 1896 till the 15th March last. In view to Ascertaining the thickness and Continuity of the Corundum bearing-bands, & to determine the proportion of Corundum in the matrix-rock, trial excavations

excavations were made & the broken-up rock as well as the cleaned Corundum were weighed. It was found that 722 Cwts of Matrix-rock yielded 2,845 lbs of Corundum i.e nearly 3.5 per. Cent. & that the cost of the Operations was Rs 385-2-0. In reporting the results, Mr. Middlemiss pointed out that the two items of greatest Expense were those for breaking out & Cleaning the Corundum by hand. And that concluded with the following Observations:-

"It is clear therefore, that if the extraction of Corundum is attempted on a large scale, the adoption of Machinery for Crushing and washing the Corundum as a substitute for hand work, would be a desideratum. . . . . Work had to be closed on 15th March. Meanwhile, Samples of the Corundum and Matrix rock will be sent

Report flagged C

to firms in India & England for testing and valuation. Should their reports be favourable and the percentage of Mineral to Matrix deemed not prohibitive, I shall hope to make further trial over Excavations at other places along the Paperapatti band of out-crops."

The off. Director, Geological Survey, Mr. Oldham, forwarded to this Govt a copy of Mr Middlemiss's report above × ref

× letter in G.O. 2586 20.5.97 flagged D

× flagged C/3

Mr. Middlemiss's report above × ref

× letter in G.O. 2586 20.5.97 flagged D

× flagged C/3

& requested that he might be informed of the intentions of this Govt in the matter of the Continuance of the Investigation of the Corundum of Salem & Coimbatore Districts, giving at the same time his own opinion on the subject in the following words:- "I would recommend that in addition to Continuing work on the Paperapatti band some other locality be investigated

66

excavations to be investigated, the exact locality to be decided by you (or addressed to the Secretary) in Consultation with Mr Middlemiss. Should this be decided on and Co-arrangements made by you for the execution of the work, I am prepared to recommend to the Govt of India the deputation of a Departmental subordinate to assist Mr Middlemiss in the Supervision of the operations."

The Mr. Middlemiss's Report and the Director's letter were both referred to the Board of Revenue in order to ascertain its views on the subject. The Board has now sent up a meagre report, after learning from messrs Arbuthnot & Co. that the Market price of Corundum of the best Quality is Rs 4. The Board says that as the Cost of 1 cwt here Rs was over

Govt flagged C 3 of P

C 1005/87

This may be two prices of Corundum quoted for the surface & Mongabi by Watkins
Jg

over 19 Rs. in Mr. Middlemiss's experiments, it would appear that the Salem Corundum cannot be extracted by hand at a cost which would admit of its being sold at a profit.

The Board seems to be in error in saying that the cost of extracting one Cwt of clean Corundum in the trial excavations, is over Rs 19, for it comes to only a little over Rs 15. But even as this figure is nearly four times the market price of the best quality, the Board's Conclusion that it won't pay to extract Corundum by hand appears to be Correct. The question however still remains whether Mr. Middlemiss should be asked to Continue the investigation as recommended by Mr Broadfoot the Director. It seems clear that from the processes of manual labour hitherto adopted by Mr Middlemiss no definite pronouncement as to can be made whether the mining for Corundum in the rocks of Salem would be a

according to Mr Middlemiss
Report 3·9 Lbs
Rs 2845 to cost Cleaned corundum cost-
Rs 385·125 worked as 7 pies :. 112 Lbs
worked 5·16 or 1 Cwt- cost- 15·14 Rs.
Jg

WMc
10.5.87

The Board's conclusion is even allowing for the comparative peculiar Expense of these rough methods of working the extraction of corundum will not pay.

WMc
10.5.87

Rohida, reporting on Headings
Eq = 1855 mid x I Cwt. Clean
Corundum would be worth at Home
from £15 to £20 a ton. This
@ £3 per Rupee would be 12 to
16 a hundred weight.
Jg

a profitable Concern or not.
In his report dated the 8th June 1896, Mr. Middlemiss himself had stated as follows:—

"For making a thorough practical test of the value of the Corundum mines, machinery must be employed as to the nature of which I can give no advice other than that it must be capable of gently pulverizing the rock without grinding it into powder after which a process of washing, or some other method depending on Specific gravity, will serve to separate out the Corundum."

. . . . . .

If the corundum areas are to be practically tested in the way I have indicated above, it will be necessary to Consult with Mr. Anderson (the mining specialist) as to the methods and machinery which he will prefer to adopt, having regard to the nature and

portions marked in pages 314 of G.O. No 3072 1.8.96
Flagged

Concerned. and I know not worth
am while to incur any more
Expense on the matter.

12/8/97.

I don't think there can be much to Coo's letter settles the point. We must ascertain what Corundum is worth in England.
JG

Mr Middlemiss is a geologist not eng. All that can be expected of him, is, it is submitted to map out where the corundum lies. Further practical investigation would necessitate call for the services of a mining Specialist.
JG
10.8.97

I do not think any mining Specialist will undertake a 30/ corundum deposit which has to be blasted out & put on the market for 40/ a cwt.
12/8/97.

and distribution of the minerals in the Matheis as described in my report on the Corundum areas. Until the requirements in this direction are known, an estimate of costs Cannot be prepared."

It would thus appear to be therefore clear that Mr. Middlemiss is not aware of the best and cheapest methods of working the mineral and that no practical results as to its economic value can be expected by asking Mr. Middlemiss to repeat his experimental excavations in other localities also, as recommended by the Director. Probably the work of practical investigation of the Corundum areas cannot be done except by a mining Specialist. In any case, before further expenditure is incurred by this Govt in this direction, it is thought that the Director or Mr Middlemiss should be asked to ascertain if possible from Experts at home, the cha

What it is desired to ascertain is, as I understand it, whether the corundum deposits will pay to work commercially. The experiments made already seem convincing that it possesses the quality. Geologically it may be of interest to know more about the lie and direction of the corundum bearing rocks but the matter seems entirely from the point of

and most effective means of extracting the mineral from the rocks, and that operations should, if at all, be commenced only on approved methods and with the machinery required.

In the meantime, the Director may be asked to spare Mr. Middlemiss for other work in Vellore, Kurnool & Salem.

In its Proceedings dated the 5th May 1895, No 3151, the Board of Revenue, in the Settlement Deptt, brought to the notice of Govt the fact that Mr. Middlemiss could not go to inspect the mica mines of N. Arcot without the Director's sanction. From the note flagged C, from the Collr of Cuddapah of 9th Dec. & No. 1047 of 1897, it will be seen that the Board in the Land Revenue Department, pointed out to Mr. Middlemiss the importance of the early investigation of the iron ores of the Kurnool District and that Mr. Middlemiss who

This will involve expenditure running to lakhs of rupees which I cannot think will be undertaken on the data.

[illegible] 1897.

The value of the coal in England should be ascertained first.

[illegible]

× in G.O. 2816 / 3.6.97 flagged A/4

Submitted that it does not appear what good Mr Middlemiss could do by inspecting mica mines. Mr Anderson the mining specialist was, as it was thought, likely to be able to suggest improvements in mining for mica but Mr Middlemiss is not a miner & apparently knows nothing about mining

[illegible] 10.5.97

I quite agree. What we want is a miner not a geologist. So far as mica and iron is concerned in Nellore & their alleviation and a geological description and taken. Mr. Middlemiss might do some practical work in Kurnool but the Kangamalais

71

who concurred in the Board's view was not permitted by the Director to proceed to Kurnool, but on the other hand taken to task for having ventured into correspondence with this Govt and on the subject, and expressed his opinion on a matter which involved a change in the programme of the Department.

5338/97.

Again, in C.No ~~5912/97~~, the Board in the Land Revenue Department recommend that Mr Middlemiss may be deputed to pay a visit to the Kanjamalai hills of the Salem District in order to point out the place where 300 tons of iron ore can be conveniently excavated for being shipped to England. In G.O. No 1022, dt 30.3.97 the Board of Rev: & this Govt accepted the recommendation of Major Mahon, that 300 tons of Salem iron ore & 600 tons of Bengal coal should be despatched to Eng Messrs

[illegible] 1897.

He might be able to do this

[illegible] 10.5.97

If we [illegible] that his time [illegible] can do this if he stops asking questions.

[illegible] 1897.

× flagged D/4

messrs. Bolchow, Vaughan & Co. of Middlesborough-on-Tees for the purpose of determining, by actual experiment the value and cost of production of pig. iron made from Indian ore with Indian ~~&~~ Coke. The Govt of India was also addressed on the subject, and the Board of Revenue was requested in the meantime to ascertain the cost of Collecting the necessary quantity of ore and Conveying it to Middlesborough. & further to make such ~~further~~ arrangements as might be practicable in order to secure the early despatch of the Consignment in the event of the proposal being approved by the Govt Of India. No reply however, has as yet, been received from the latter. The Collector of Salem who was ~~accordingly~~ asked by the Board to report on the question of Cost, has submitted an estimate in which the cost of

collecting and placing on railway trucks 300 tons of ore has been fixed at Rs 1,750. The Collector says that ~~this~~ ~~operation is~~ ~~now~~ the process of obtaining the ore is neither so simple nor so cheap as is stated in the Salem District Manual (Vol I page 98-99). and suggests that a geologist (Mr Middlemiss) should be deputed to select the ore to be excavated and that the excavation should be carried out under professional supervision.

In C no. 5912/97. the Director. Geological Survey of India says that he would deprecate the transfer of Mr Middlemiss from the survey work of Salem & Coimbatore unless for a matter of great importance & urgency. As regards the work proposed for Mr. Middlemiss in Kurnool, Mr Oldham says that ~~by~~ what is wanted

A. D. F. W. Subordinate. Minute on last minute. It is entirely to last Secretary Secretary.

Yes 24 11/1/97.

This it would appear that Mr Middlemiss has plenty of work in Vellore, Kurnool & Salem

This is the Geological view

11/1/97.

is merely the collection of the samples of iron ore, it could be done by the Revenue officials, but that if a detailed examination of the geological relation and mode of occurrence of the ores is required, it would occupy a considerable part of a working season. and will have to be provided for in the programme of work of the Department, and he thinks that the investigation of the Kurnool iron ores may be postponed. pending receipt of the results of the experiments proposed to be conducted in England in connection with the Salem ores.

The Board of Revenue no. doubt, first said that the object of deputing Mr. Middlemiss to Kurnool was to collect specimens of the best Kurnool ores to be sent home to the

This is all that is wanted in Salem but in Kurnool I understand that much more which is pure geological work is needed for the best ores have not been examined at all in the same way that the Salem ores have been

Wm Ogg.

In this Govt is concerned with the Geological but with the Economic side of the question I think the Kurnool experiments for the moon given in Govt of Madras G.O. No. 1502 of 18th Dec 1896 should be flagged

B. P. in G.O. flagged

D4

flagged DD.

the Imperial analysis. the most easily ever seems to be the Kurnool selected of the practicability clearing the Kurnool ore do Baratur coke is to be investigated as desired by the Board of Rev: in his D.O. of 29.5.97. the Hon'ble Mr Sturrock says that if Salem ore is to be worked up with Bara. Kur coal it is important that ores supposed to be valuable nearer the coal (i Kurnool ores) field than Salem should be Equally thoroughly investigated.

In these circumstances, it is submitted that the Director Geological Survey may be asked to instruct Mr Middlemiss (1) to suspend the Cuddapah investigation until the best means of extracting the mineral are ascertained from experts at home & (2) to proceed to Vellore for the inspection of the mica mining indus- tries to Kurnool for a the

. tation of the
is merely yes there, & lastly
the Dept collect the
it Co Kanjamalai
Rly required for shipment
England.

It seems clear that Mr Middlemiss
as a ~~prof~~ geologist can only
ascertain the occurrence & describe
the nature of the various ores.
He appears to have no knowledge
or skill for the purpose of
carrying out practical
mining experiments. Therefore
it seems doubtful whether
his experiments in extracting
corundum have any value at
all. He intimates that Mr
Middlemiss should be left to
finish his survey of the
corundum belts which appears
to have been interrupted by his
mining experiments. He might
possibly help to show where
the best Kanjamalai iron
should be extracted from. Even
with regard to this I may say
Says that if the experiments
"be a test one then neither

the best ore nor the most easily
extracted ore should be selected
It does not appear clear
what good he could do
by inspecting the mica mine
and as for surveying the
iron ores of Kurnool this
Submits that that may
be left over till the survey
of corundum is finished,
unless the Govt decides to
send iron ore from Kurnool
also to Messrs Bolckow
Vaughan & Co of Middlesbro
or Ires.

WLL
10.8.97

I submit that as far as this
Govt is concerned
1. We do not want any further
investigation of the Corundum
deposits.
2. We want the Kurnool iron
examined by Mr Middlemiss
as soon as possible.
3. We want Mr Holland to
visit the mica mines in
Nellore or failing him a
Mining Specialist in India

WLL 1810

There are ample cases where being
done about Corundum. If we
could get more for it than Rupees
ten per ton we give, it could be
worked properly, but the values in
England are so low.
JG

Yes, but we must talk to
Director on
JG

Yes
JG
16/8/97

D/4 1,000—8-4-97.

79/ 5.5.5-1
6-10-97.

Extraction of Salem iron ore

REVENUE DEPARTMENT.

No.

Dr Mad-d-Commrs

From

Dated 189 .

FOR ORDERS.

Hn. Hon. M.R.I. wood Esq

I was speaking to Mr Hollins last night in regard to this matter and I asked him if the Govt. of Mr Thompson Govt. He said that he thought they could not properly be allowed to do because it required expert skill to distinguish rich from poor ore. This is a very important matter & requires consideration perhaps. It might be well therefore and Mr Priddle-Commrs to visit the mine also. Submit this paper for orders of Govt.

With the Hon member please see the note flagged A in the accompanying note for orders.

It has been recommended by the Govt of India that 300 tons of Kanyamalai iron should be sent to messrs Belchen Vaughan & Co of Middlesborough & tests with an equal amount of Barrakur coal for the purposes of experiment. Pending the receipt of the Govt of India orders the Collector of Salem can be asked to make everything ready for extracting & despatching the ore on receipt of orders. The Collector can be asked, enquire his inability to get out the ore & suggest that he

R.E. 22/9/97.

80

FOR ORDERS.

...ion should be deputed to help him. The matter was stated by order in the note submitted & Mr Ley remarked that a D.P.W. subordinate might be deputed to get the ore out. The Hon' member agreed. The Secy has since seen Mr Holland about this matter & asked him if the Local P.W.D. subordinate could get out the ore or not. He said Mr Holland is of opinion that the work is not safely to be entrusted to such agency as it requires expert skill to distinguish rich from poor ore. It is very important that no mistake should be made in sending any representation or to England & so it is submitted that the orders passed may be modified in this respect & the Director Geological Survey told that Mr Middlemiss may be required to assist in getting the ore out.

Secy
21-9-97

Sir

Mr Middlemiss should be asked D.O. if he can undertake this work.

JG
21/9/97

81

REVENUE DEPARTMENT.

No.

Further Geological Investigation in this Presidency.

From

Dated 189 .

Hutchinson Mr Grose C.S.

FOR ORDERS.

Office get pencils as soon as possible. Mark first three papers for convenience of reference been taken from their places in the file & placed at the top.

With reference to the Hon Member's note on the last flapped Z attention is respectfully invited to para 3 of Mr Oldham's letter (in the S.G.I. flapped X) and also to the same Officer's letter to Mr Middlemiss (in the G.G.I.) flapped Y. It is submitted that in the circumstances Mr Middlemiss if ordered direct would probably profess inability to reply without his Director's orders, and that, therefore the Director may be addressed on this point at once while we are writing them on the general question.

A draft G.O. and-

Right
JG

82

letter which were drawn up in accordance with the Hon Member's orders are now submitted for approval, the modifications made in accordance with the suggestions above being marked with blue pencil.

Ellis 29-9-97

29.9.97.

Q Print

Secy fro.

Note

These drafts deal with the question of corundum investigation the investigation of kurnool ores & the inspection of mica mines a Nellore.

On the docket of Cur No 5-338 (the top paper of the bottom file tied with white tape) is a draft upon Mr Mennell's request that Mr Middlemiss might be deputed to show him where to get the iron ore from Kanjamalai

Ellis 16.9.97

The draft copy was put up with the papers under the impression that it was the draft order & Cur should send a telegram to Mr Mennell

JG 2/10/97

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Read again E.O. 4864/30-11-96 A+B.P. in full

E.O. 5538/24 Dec 96 P

E.O. 1747/1 Apr 97 P

E.O. 2387/12 May 97 P

E.O. 2528/20-May 97 P

Read Cur No 44141 in full.

Read also again E.O. 2160/29 April 97 P

E.O. 2582/20-5-97 Director's letter in full, Mr Middlemiss report as an enclosure in full & E.O. in full.

E.O. 2816/3 June 97 all papers in full

Read also Cur No 5866 in full & Cur No 5912 in full

Copy

E.O. No 846 of 6th Oct: 1897.

In 1895 the Government resolved to institute a systematic mineralogical Survey of the Presidency with a view to the discovery and allocation of those mineral products which would be likely to prove of economic value. The importance of such a survey was urged on the Govt of India and that Govt was asked to sanction the appointment of a Skilled Petrologist for the purpose. After some correspondence, however, it was

decides that an officer of the Geological Survey of India should be deputed to this Presidency to conduct a practical enquiry.

2. Mr Middlemiss the officer deputed for the purpose has been engaged since his arrival in the investigation of the corundum deposits in Salem. In 1896 arrangements were made for the employment of a mining Specialist Mr Anderson in to practically determine the value of the corundum deposits discovered & described by Mr Middlemiss. Mr Anderson however resigned his appointment late in the year and the task of extracting & valuing the corundum was undertaken by Mr Middlemiss with the help of a Subordinate of the P.W.D.

3. The results of Mr Middlemiss experiments are given in his report printed above. It is observed that the cost of excavating and cleaning 284,5 lbs of corundum was 385 Rs 2 as. The cost of 1 cwt of cleaned corundum was therefore 15 Rs 2 as 7 pies. From the information available the current market price of corundum

forwarded in reported
to the Board's Proc. read ab. 2
16.
do to 4 to per cwt delivered
in Madras. This period, however,
is possibly that of corundum
gathered from the surface &
not thoroughly cleaned. Before
giving a definite opinion therefore
on the possibility of working
the corundum deposits in Salem
on a large scale
with commercial success, the
Govt will await the report
promised by Mr Middlemiss
on the results of valuation
& testing of the corundum
extracted by him.

4. The Govt however are
decided of opinion that the
results of the experiments made
do not justify for the continuance
for the present
of Mr Middlemiss investigations
in Salem & Coimbatore and that his further
employment in these Districts
would, with reference to the object of
his deputation to this Presidency,
be a waste of time. The Director
of the Geological Survey Dept will
be informed accordingly with
reference to the 1st of his letters
cited above.

5. In the event of his

mendation, the Director asks for a statement of the wishes of the Govt as to future geological investigations in this Presidency.

6. With reference to the question of working the coal seams of Salem, the Govt has recommended to the Govt of India the proposal to ascertain & actual experiment the cost of working Salem coal with Barraken coal. Pending the result of this experiment it is deemed impossible to definitely affirm or deny the possibility of working the Salem ores profitably cannot be definitely affirmed or denied. In the meantime the Govt considers it of highest importance that ores supposed to be valuable lying near to the coalfields should as thoroughly investigated as those of Salem have been. In the first of the papers read above the importance of investigating the kurnool coals area has been well represented by the Board. The Govt considers that the Madras should be deputed to Kurnool without delay in the interest of surveying

Should the proposal be accepted, it will be necessary to extract 300 tons of the Salem ore and the Govt would be glad if the Madras Govt would avail itself of the Middlemiss services in selecting the ore

8½

87/

and describing these ores. 3/2/97

7. With reference to the Board's recommendation suggesting that the mica mines in Nellore should be inspected & an expert who might suggest improvements in order that the Madras Govt might be suggested in the mode of extraction & preparation of the mica for the market, the Director of the Geological Survey will be asked to depute Mr Holland for this purpose. Mr Holland will report on the industry while assuming large dimensions. Should present expansion necessitate additional

15/9/97 17.9.97

Letter No. 847

To The Secy of Govt (Mis. Dept)
Do. of Govt (Rev)

Keep pending 29/10/97

7/5

Keep pending 9/10/97 mucs.

JG

To the Director
Geological Survey
of India

Sir

With reference to your letters No 357 of 11 May 1897 and No 594 of 6 July 1897 I am directed to forward a copy of the G.O. No 846 of this date wherein the views of H.E. the Governor as to the continuance of the

investigations of the corundum areas of Salem & Coimbatore and as to the ~~future~~ geological investigations in this Presidency, from the economic point of view are set forth.

2. It will be observed that, as to corundum, H.E. the Gov C, while reserving a final opinion pending the valuations of the specimens extracted by Mr Middlemiss, is clearly of opinion that the results of Mr Middlemiss' experiments do not justify the continuance of his investigations in respect of this mineral.

3. On the other hand, the fact ~~possibility of workings~~ that it may be proved possible to work the Salem iron ores profitably with Burrakur coal, makes it important that the occurrence & nature of iron ores lying nearer to the coalfield should be determined & described without delay. I am directed accordingly to request that

~~this~~ and may also be required to ~~ascertain~~ the ~~position~~ of it may be necessary that England be supplied with specimens for experimental tests when

---

D/4 1,000—8-4-97.

REVENUE DEPARTMENT.

No.

From

Dated 189 .

~~FOR ORDERS.~~

Mr Middlemiss may be deputed at an early date to investigate the iron ores of the Kurnool District and ~~that~~ may also be required to give evidence ~~of this~~ before the Committee referred to, H.E. the G.G. in C.

+ After Govt have given approval of the proposal to send one of Salem ore to England for experiment, ~~Mr Middlemiss~~ ~~should be asked~~ the Govt would be glad of Mr Middlemiss' assistance in the extraction of this ore also.

Engineers, at present engaged in assisting Mr Middlemiss in the survey of the corundum areas.

The Board of Revenue suggests that some an expert should be deputed to inspect the mica mines in the Nellore District. H.E. the G.G. in C is of opinion that the inspection & advice of such an expert would probably correct & improve the crude & wasteful method in which mining operations for mica are at present conducted in that District

20.

FOR ORDERS.

Mr Holland, both from his previous acquaintance with the District and his practical knowledge of Mica its uses and the general requirements of the market, appears to Mr Erwin particularly well qualified for such work, and as his term of deputation to this Presidency expires in 1898, H.E. the G.in C. considers that the opportunity should be taken, if possible, of utilising his services in this direction during the ensuing cold season.

Should not be lost.

Mlle
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1897.

THE DIRECTOR GEOLOGICAL SURVEY OF INDIA.

From

The Government of Fort St. George.

Recd. } 1897. *Enclosures*

Regd. *Spare copies*

Letter, No. 847, 6th October 1897.

OCTOBER.

REQUESTING that Mr. Middlemiss may be deputed at as early a date as possible to investigate the iron ores of the Kurnool district, and stating that the services of Mr. Holland should, if possible, be utilized during the ensuing cold season in the inspection of the mica mines in the Nellore district.

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REVENUE DEPARTMENT.

From

The Hon'ble Mr. G. STOKES, I.C.S.,
Acting Secretary to the Government of Madras,

To

The DIRECTOR, GEOLOGICAL SURVEY OF INDIA,
Dated 6th October 1897.

Sir,

Miscellaneous.

With reference to your letters, No. 357, dated 11th May 1897, and No. 594, dated 6th July 1897, I am directed to forward a copy of G.O., No. 846, of this date, wherein the views of His Excellency the Governor in Council as to the continuance of the investigation of the corundum areas of Salem and Coimbatore and as to the pressing subjects for geological investigation in this Presidency, from the economic point of view, are set forth.

2. It will be observed that, as to corundum, His Excellency the Governor in Council, while reserving a final opinion pending the valuation of the specimens extracted by Mr. Middlemiss, is clearly of opinion that the results of Mr. Middlemiss' experiments do not justify the continuance of his investigations in respect of this mineral.

3. On the other hand, the fact that it may be proved possible to work the Salem iron ores profitably with Barrakur coal, makes it important that the occurrence and nature of iron ores lying nearer to the coal field should be determined and described without delay. I am directed accordingly to request that Mr. Middlemiss may be deputed at as early a date as possible to investigate the iron ores of the Kurnool district and also to aid in getting out some of the ore, if necessary. If the Government of India approve of the proposal to send 300 tons of Salem ore to England for experiment, the Government would be glad of Mr. Middlemiss' assistance in the extraction of this ore also.

4. The Board of Revenue suggests that an expert should be deputed to inspect the mica mines in the Nellore district. His Excellency the Governor in Council is of opinion that the inspection and advice of such an expert would greatly correct and improve the crude and wasteful methods in which mining operations for mica are at present conducted in that district. Mr. Holland, both from his previous acquaintance with the district and his practical knowledge of mica, its uses, and the general requirements of the market, appears to be particularly well qualified for such work, and as his term of deputation to this Presidency expires in 1898, His Excellency the Governor in Council considers that the opportunity should, if possible, be taken of utilizing his services in this direction during the ensuing cold season.

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

(Signed) G. STOKES,
Ag. Secretary to Government.

Exd. W. D'Moss.
30 Copies.

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Government {1897} of Madras.

REVENUE.

Recd. } 1897. *Enclosures*

Regd. *Spare copies*

G.O., No. 846, 6th October 1897.

OCTOBER.

Geological investigation in the Madras Presidency.

Passing orders on the question of the continuance of the investigation of the corundum areas of Salem and Coimbatore, the investigation of Kurnool ores, and the inspection of mica mines in Nellore.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—again the following G.O., Mis. No. 4864, Revenue, dated 30th November 1896:—

Read—the following Proceedings of the Board of Revenue (Land Revenue), Forest Mis. No. 1441, dated 2nd November 1896:—

Read—again Proceedings of the Board of Revenue (Land Revenue), No. 361, dated 23rd September 1896.

Resolution—Forest Mis. No. 1441, dated 2nd November 1896.

In the Proceedings read above, the Board has confined its remarks to the Salem iron with regard to which reports have been received, but there are other iron fields in the Presidency which require investigation, and the Board would specially mention Kurnool, where a very large quantity of charcoal could probably be obtained from the Nallamalai reserved forests which are traversed by the Bellary-Kistna railway.

2. The Board would therefore recommend that Mr. Middlemiss be directed to collect specimens of the best Kurnool ores to be sent home to the Imperial Institute for analysis similar to those made of Salem ore and quoted at page 10 of the Proceedings read above. The ore at Rudravaram, on the borders of the Nallamalai forests, and not far from the line of rail, is understood to be of excellent quality.

3. The Conservator of Forests, Northern Circle, is requested to submit a report with regard to the charcoal supply available in Kurnool near the line of rail similar to that called for from the Conservator, Central Circle, in paragraph 4 (2) of Board's Proceedings, No. 361, dated 23rd September 1896. The cost of an annual supply of 5,000 tons and of 10,000 tons should be separately considered.

(True Extract.)

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

To the Secretary to Government, Revenue Department.
„ Conservator of Forests, Northern Circle, with Board's Proceedings, No. 361, dated 23rd September 1896.
„ Conservator of Forests, Central Circle.

Order—Mis. No. 4864, Revenue, dated 30th November 1896.

As recommended by the Board of Revenue Mr. Middlemiss will be requested to pay a visit to the Kurnool district to collect specimens of the best iron ores found there and to send them to the Imperial Institute for analysis.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

To the Board of Revenue (Land Revenue).
„ the Board of Revenue (Revenue Settlement, Land Records and Agriculture).
„ C. S. Middlemiss, Esq.

Read—again G.O., Mis. No. 5338, Revenue, dated 24th December 1896.

Abstract.—Communicating to the Board letter from the Superintendent, Geological Survey of India, with the request that the necessary instructions might be issued to the Kurnool Collector to render every assistance to Mr. Middlemiss in the prosecution of his investigations in regard to the collection of specimens of iron ore found in the district.

Read—again G.O., Mis. No. 1747, Revenue, dated 1st April 1897.

Abstract.—Communicating to the Board of Revenue letter from the Superintendent, Geological Survey of India, stating that no opportunity offered during the past cold weather field season of visiting Kurnool for the purpose of collecting specimens of iron ores and that such a step would have been inadvisable inasmuch as the Director had deprecated any investigation of these ores until the question of the Salem iron ores is settled.

Read—again G.O., Mis. No. 2387, Revenue, dated 12th May 1897.

Abstract.—Recording, with remark, Board's Proceedings on letter from the Superintendent, Geological Survey, regarding collection of specimens of Kurnool iron ores for the Imperial Institute, and considering that it is of importance that the investigation of the Kurnool iron ores should be proceeded with without delay.

Read—again G.O., Mis. No. 2578, Revenue, dated 20th May 1897.

Abstract.—Recording Board's Proceedings recording, with remark, letter from the Superintendent, Geological Survey of India, proposing to visit Kurnool for investigation of iron ores at the close of the recess.

Read—the following Proceedings of the Board of Revenue (Land Revenue), Mis. No. 1836, dated 19th May 1897:—

Read—the following letter from C. S. MIDDLEMISS, Esq., B.A., Superintendent, Geological Survey of India, Ootacamund, to the Secretary to the Commissioners of Land Revenue, Madras, dated 10th May 1897, No. 25-S.—R.:—

In continuation of my No. 11-R.S. of 24th April 1897, I have the honour to append a copy of the letter from the Officiating Director, Geological Survey of India, for your information and guidance.

Enclosure.

From R. D. OLDHAM, Esq., Officiating Director, Geological Survey of India, to the Superintendent, Geological Survey of India, dated Calcutta, 5th May 1897.

In acknowledging receipt of your No. 12-R.S. of the 25th April I have the honour to point out to you that your action, in entering into correspondence with the Government of Madras on a subject regarding which you have not been put in communication with them, and in expressing your opinion to them on a matter which involves a change in the sanctioned and proposed programmes of work of the department, is irregular and inconvenient.

2. As regards your present application for permission to spend from two weeks to a month in the investigation of the Kurnool iron ores during the next working season, I have to inform you that I cannot find in the papers before me any reason for modifying my previously-expressed opinion that it would be inadvisable to interrupt the work you are at present engaged on and am consequently unable to sanction your proposal.

3. For your future guidance, I have to request that you will be good enough to immediately refer to this office, without entering into further correspondence on the subject, any demand made on you by the Government of Madras, which would in any way interrupt the work on which you or any member of the department placed under your control are engaged under the instructions or with the approval of this office.

4. This instruction should not, however, be interpreted as prohibiting you from rendering the Government of Madras all assistance in your power, by affording them information or advice on any question they may submit to you, so far as this can be done without interruption to your appointed work.

Resolution—Mis. No. 1836, dated 19th May 1897.

Recorded.

(True Copies and Extract.)

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

To the Secretary to Government, Revenue Department,
with reference to its Order, Mis. No. 2387, dated 12th May 1897.

Read—again G.O., Mis. No. 2160, Revenue, dated 29th April 1897.

Abstract.—Forwarding to the Board of Revenue, for remarks, letter from Mr. Middlemiss, Superintendent, Geological Survey of India, forwarding a report on the trial excavations for corundum near Palakod, Salem district.

Read—again the following G.O., Mis. No. 2586, Revenue, dated 20th May 1897:—

Read—the following letter from R. D. OLDHAM, Esq., Officiating Director, Geological Survey of India, to the Secretary to the Government of Madras, Revenue Department, dated Calcutta, 11th May 1897, No. 357:—

With reference to the enclosed report on some trial excavations for corundum near Palakod, Salem district, by Mr. Middlemiss, I have the honour to request that I may be informed as soon as possible of the intentions of your Government in the matter of the continuance of the investigation of the corundum of Salem and Coimbatore districts.

2. I would recommend that, in addition to continuing work on the Paparapatti band, some other locality be investigated, the exact locality to be decided by you in consultation with Mr. Middlemiss. Should this be decided on and arrangements made by you for the execution of the work, I am prepared to recommend to the Government of India the deputation of a departmental subordinate to assist Mr. Middlemiss in the supervision of the operations.

Enclosures.

Report on some trial excavations for Corundum near Palakod, Salem district, by C. S. MIDDLEMISS, Esq., B.A., Geological Survey of India.

Introduction.

1. My preliminary reports [1] on the corundum-bearing beds in the Salem and Coimbatore districts having shown that a practical trial as to the richness and value of the deposits was advisable, it was decided, after consultation with the Government of Madras, that the executive part of the work should be carried out by the Public Works Department under the supervision of the Sub-divisional Officer of the Public Works Department for the Tiruppattúr Circle, whilst the sites to be tested and the general conduct of the operations should be superintended by myself, with the help of a native assistant geologist, Mr. S. Sethurama Rau, B.A., who would personally and continuously watch the operations and carry out instructions furnished by me.

2. I chose first a site in some waste land near the village of Erranahalli, and about 2¼ miles south-west-by-south of Palakod, the nearest large town. The position was one among a number of outcrops of the corundum-bearing band, now known as the Paparappatti band. This will in future be referred to as No. 1 working. As soon as the necessary formalities had been complied with and the preparations completed, experiments were started in November 1896 and continued until 15th March 1897.

3. Before going any further it will be well to state what was already known concerning these corundum occurrences. On my first visiting them in 1894 the only information then available was that corundum occurred near Pennagaram in the Dharmapuri taluk, as shown by the presence of specimens in the Madras Museum, thus labelled, sent by the local authorities. Since then details were from time to time gathered by my survey, so that up to the time of the opening of the pits at working No. 1 the information stood as follows:—

[1] Reports to the Government of Madras, the first of which was reprinted with slight alterations in Records, G.S., I., Vol. XXIX, pt. 2, 1896, pp. 43—46.

(*a*) The actual matrix of the corundum in this band was known to be in the form of lenticles in a gneiss, among which biotite was prominent as the dark mineral. Such of these lenticles as had actually been seen *in situ* were, however, small, the largest being 3 feet by 1 foot.

(*b*) That larger lenticles occurred in the alluvium covered plain near Paparappatti and on the hillsides to the west, was, however, inferred from large blocks having been found in the surface debris.

(*c*) It was known from the presence of old shallow trenches and pits in the alluvium and surface rock that corundum had been dug at some previous time from this neighbourhood. Local information, and the exposure of corundum for sale in the surrounding market towns, also made it certain that corundum was at that time being occasionally gathered.

(*d*) It was also evident that, in a general way, the strike of the rock bands containing the corundum was with the strike of the country, namely, about north by east and it was supposed from the slightly different character of some of the corundum occurrences and also from their position that more than one parallel band of the rock existed.

(*e*) The position of all the corundum occurrences was as indicated on the accompanying plan, from which it will be seen that the Paparappatti band extends (but with some notable gaps) from Donnakuttahalli near the Cauvery river to Chintalakuttai village, near Rayakottai, a distance of nearly 40 miles.

4. The general object of the practical work which I was now endeavouring to carry out was, as stated in the Annual Report of the Geological Survey for 1896, namely—"The excavations, or quarries as they will be, are intended to show the thickness of the corundum-bearing bands, and whether they are continuous or occur as lenticular patches. A fair average sample of the rock extracted, of sufficient size to give a trustworthy estimate of the richness of the rock, is to be carefully cleaned by hand and the proportion of corundum to matrix determined by weighing."

5. The nature of the work resolved itself into—

(*a*) Preliminary clearing of the ground of jungle.
(*b*) Digging of trenches until the corundum-bearing rock was exposed.
(*c*) Blasting and quarrying the matrix-rock.
(*d*) Breaking up the lumps with wedges and hammers into sizes suitable for demolition by hand.
(*e*) Cleaning the corundum by hand and weighing.
(*f*) Excavations to show continuity or otherwise of the rock matrix.

Geological Details.

6. A brief outline only will here be given regarding the petrology of the neighbourhood of the workings, inasmuch as many details still require working out. I may mention, however, in particular that in addition to biotite in the fundamental rock in which the lenticles occur there is at this place much hypersthene also present, which together with felspar, quartz and iron-ores makes up a biotite-hypersthene granulitic gneiss, and which is therefore mineralogically a passage between the ordinary charnockite series and the Hosur biotite gneiss. It is finely, and not very distinctly foliated, the strike being generally between north and south and north-north-east and south-south-west. The dip of the foliation planes is generally steep, approaching vertical in most available sections, but the amount and nature of the folds indicated by such dips are never definite enough to allow of a sectional representation of them.

7. Occurring sparingly as adventitious veins and veinlets in this gneissic rock, and palpably younger in age than it, come a coarse flesh-pink and white, rather coarse pegmatite, and some trap dykes. These veins and dykes, though sometimes following the foliation, also occur completely irregularly. Some of the gneiss also presents the character which has been called "trap-shotten," a feature peculiar in itself and too complicated to be described in this note.

8. The actual matrix of the corundum in the workings was found, as anticipated from my previous observations, to be in the form of lenticles in the gneissic rock. These lenticles are symmetrically shaped and are easily recognised by their external shell of rock very rich in biotite, and by the paler-coloured central parts which are less rich in ferro-magnesian minerals. The exact mineralogical composition of these lenticles is still under investigation, and both it and the origin of the lenticles offer problems whose solution will not be attempted here. In size the lenticles vary from the very small ones referred to in my previous report up to such as the one broken up at No. 1 working, which measured 13 feet long, by 8 feet broad and 9 feet

deep; the shape being that of an ellipsoid with three unequal axes. A plan showing the excavations at No. 1 working and in the vicinity (see Plate) will sufficiently make clear the disposition, shape and size of the three lenticles which have so far been exposed in the course of the work, and will indicate the degree of probability attaching to the statement, which I think is a correct one, that these lenticles are really dispersed in a bed, layer, or plane, and that therefore they have the same general continuity as any other rock band. In support of this it may be mentioned that half a mile west-south-west of Gollahalli subsequent trial trenches exposed a large lenticle, along the same line of strike, and identical in composition with the three already referred to. This lenticle on partial exposure measured 15 feet long by 8 feet broad.

As these lenticles were originally only indicated at the surface of the ground by the presence of fragments of corundum and matrix-rock and by old shallow excavations, and as prospecting in the neighbourhood has revealed a great number of similar indications (roughly represented by the crosses on the map), it seems to me only reasonable to conclude that a detailed examination of the neighbourhood foot by foot and a judicious series of cross trenches would expose more lenticles of the same kind along the present line or along other parallel lines. At the present moment there must be about 20 tons of matrix left at working No. 1, and about as much in the third lenticle, whilst the Gollahalli lenticle will probably yield 60 tons or more; so that about 100 tons of matrix-rock are now ready to hand.

9. The corundum in the matrix-rock occurs in well shaped crystals which in this particular locality are of a dark purplish-grey colour. As described in my previous paper, they are surrounded by a pale pink shell of orthoclase from which they break out sharp and clean like a kernel from its shell. Their forms are elongated barrel shaped combinations of the hexagonal prism and pyramid. The size of the crystals varie considerably, but may be said to be definitely limited in the following way. The largest crystal found in the broken up lenticle was — inches × 2 inches, whilst the smallest sizes of which any account need be taken are ⅛ inch by inch. An average size for the crystals in this lenticle I should estimate at 2 inches × ¾ inch.

The corundum seems to be quite pure throughout the lenticle, but in the course of the excavation Mr. Sethurama Rau found that a layer of the outer disintegrated rock near the upper site of the lenticle yielded a number of dark nearly black lumps or nodules of hercynite mixed with corundum. Sometimes a central core of corundum was surrounded by a shell of hercynite. The latter is in a crystalline-granular state, and has probably grown in a concretionary way round pieces of corundum as nuclei. Unfortunately none of these concretions were found actually in solid rock, but inasmuch as none are present in the main mass of the lenticle, it is probable that they came from the outer crust of it where ferro-magnesian minerals are more thickly grouped.

Proportion of corundum in the rock.

10. One of the chief objects, or rather the chief object, of the practical investigation of these rocks, was to determine by careful weighings the proportion of corundum in the matrix-rock. To attain this end the broken-up rock was weighed as it was given out to the coolies, and the resulting corundum was collected at the end of each day and also weighed. This was done every day and a regular account kept.

The total results as given me by Mr. T. Ramanujam Pillay, Sub-divisional Officer, Public Works Department, in charge of the work are—

722 cwts. of matrix-rock yielded 2,845 lb. of corundum, or 3·5 per cent. nearly.

This total is considerably lower than the percentage obtained from the first weighing of the first ton of matrix, which gave, as quoted in the Annual Report—

1 ton of matrix-rock yielded 150 lb. of corundum, or 6·7 per cent. nearly.

From enquiry, and a study of the daily returns of the weighings, the difference seems to be accounted for in the following two ways. In the first place, when the original big lenticle was blasted, a great many of the larger crystals of corundum broke away and fell out, and they were straightway included in the first weighings. Secondly, all parts of the lenticle were not equally rich, and the richer parts appear to have been selected first. As a third reason it is possible that a certain amount of pilfering may have taken place from the exposed heaps of matrix-rock as time went on. It seems safest to take the total percentage on the whole work as giving probably the nearest approach to a true average, because so long as hand work alone is used in cleaning the corundum, if loss occurs either by pilfering or carelessness, such would also be likely to occur in actual mining operations.

Cost of the operations.

11. Although a small experiment carried on as this one has been is more likely to be more expensive than one worked on a larger scale as a paying concern, yet I give below the actual costs as offering some evidence under this head.

The figures given first below apply to the work done to the first two lenticles of matrix-rock at working No. 1, which supplied all the rock broken up and weighed. These figures also were furnished me by the Sub-divisional officer—

	Rs.	A.	P.
Clearing ground of jungle, about	20	0	0
Earthwork at the quarry, digging trenches, &c.	71	5	0
Blasting	11	9	0
Breaking matrix-rock and sorting 722 cwts. @ As. 2–6 per cwt.	112	6	0
Cleaning the above @ As. 2–6 per cwt.	112	6	0
Sundries —boxes, bags, cartage	35	0	0
Erection of sheds for workmen	22	8	0
Total ...	385	2	0

or As. 8–7 per cwt. of broken rock, *i.e.*, As. 8–7 per 3·9 lb. of cleaned corundum.

Further, it was found that 1½ men at 3½ annas were able to break 1 cwt. of matrix-rock and clean corundum from it.

12. The cost of making other excavations, exposing other lenticles, trial trenches here and at Gollahalli and near Paparappatti was Rs. 354.

13. From the figures given in paragraph 11 it will be seen that the two items of greatest expense are those for breaking out and cleaning the corundum by hand (namely Rs. 112–6–0 × 2). It is clear, therefore, that if the extraction of corundum is attempted on a large scale, the adoption of machinery for crushing and washing the corundum, as a substitute for hand-work, would be a desideratum.

Further experiments contemplated.

14. Work for the present had to be closed on 15th March. Meanwhile samples of the corundum and matrix will be sent to firms in India and England for testing and valuation. Should their reports be favourable, and the percentage of mineral to matrix deemed not prohibitive, I shall hope to make further trial exacavations at other places along the Paparappatti band of outcrops.

Order—Mis. No. 2586, Revenue, dated 20th May 1897.

Referred to the Board of Revenue for early report in continuation of G.O., No. 2160, dated 29th April 1897.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

To the Board of Revenue (Revenue Settlement, Land Records and Agriculture), with enclosures to be returned.

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to have ...
Read—again the following G.O., Mis. No. 2816, Revenue, dated 3rd June 1897 :—

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), Mis. No. 3151, dated 5th May 1897 :—

Read—again the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), Mis. No. 1798, dated 10th March 1897 :—

Read—the following letter from the Collector of Nellore, to the Secretary to the Commissioner of Revenue Settlement, and Director of the Department of Land Records and Agriculture, dated 15th January 1897, No. 117-Ver. :—

With reference to Board's Proceedings, Mis. No. 117, dated 6th instant, I have the honour to submit herewith a copy of Mr. Scott's letter, No 2706-Ver., dated 17th July last, with a copy of its enclosure, and to observe that they were originally forwarded through Mr. Middlemiss who has probably not sent them on to the Board.

Enclosure.

From E. SCOTT, Esq., Acting Collector of Nellore, to the Secretary to the Board of Revenue (Revenue Settlement, Land Records and Agriculture, through C. S. MIDDLEMISS, Esq., Deputy Superintendent, Geological Survey of India), dated 17th July 1896, No. 2706-Ver.

With reference to Board's Proceedings, Nos. 130 and 208, dated 20th May and 12th July 1895, respectively, I have the honour to forward herewith a note, together with a sketch-map in modification, so far as this district is concerned, of the information given on pages 3 and 4 of Board's Proceedings, No. 806-Sett., dated 24th December 1892, regarding the minerals—mica and garnet.

2. There is nothing more to be said about other minerals beyond what is given in the statement forwarded with this office, No. 2606-Ver., dated 13th June 1892, printed in the Board's Proceedings above quoted.

Mica.—This mineral occurs in fairly large quantities in the Rapur taluk, chiefly in the villages of Utukur, Sydapuram, Chaganam, Tummalatalapur and Padalakur and to a less extent in Turimerla and Birdavolu; in Nallapalem and Prabhagiripatnam, Atmakur taluk; Chennur and Mangalapur, Gudur taluk; and in a few villages in the Kavali taluk; also in some villages in the Venkataghiri zemindari bordering the Rapur taluk and Pamur in the Kálahasti zemindari. Since 1895 the industry has gradually developed. Formerly, only the very best transparent mica was exported, but now it appears that the black and brown stained (caused by the spread of manganese-ore and iron between the planes of cleavage) and ripple-marked mica are also exported chiefly to London. The best mine in the district is situated about 18 miles south by west of Nellore in the village of Podalakur (Inukurti). It was worked by Mr. E. H. Sargent and relinquished by him at the expiration of two years. Subsequently, a native of the district applied for the land and it has been granted to him on a two-years' lease. The mine still yields a large quantity of clear mica

The price of mica varies according to size and quality. Small plates, measuring one or two inches square, sell at home for a penny per lb. This size is generally got from tarlings and refuse heaps—while average size plates sell from 7 to 8 shillings per lb., and plates 10" × 10" at 12 to 15 shillings per lb.

Garnets.—One of the accessory minerals is found in small quantities with tourmaline and apatite in a few mines situated in the villages of Sydapuram and Chaganam. It is, however, of no commercial value. Locally, the mineral is reduced to a powder mixed with lac and formed into wheels for grinding knives, &c.

(Signed) J. H. B. BROUGHAM.

Resolution—Mis. No. 1798, dated 10th March 1897.

Recorded.

2. With reference to the Collector's remarks about mica, the attention of Mr. Middlemiss will be invited to paragraph 4 of Board's Proceedings, No. 3116, dated 24th June 1896, and paragraph 1 of G.O., No. 3072, dated 1st August 1896, thereon, from which it will be seen that the Board's proposal that the mica mines in Nellore should be inspected and reported on by Mr. Anderson who was then expected to come to this Presidency, was approved by Government. Owing, however, to Mr. Anderson's resignation, the Board observes that Mr. Middlemiss' term of service in this Presidency has been extended till 1900. He is requested to report what arrangements have been made by him to inspect the mica mines in Nellore. The mica industry, which is one of daily increasing importance, will be greatly helped, if, after inspection, he can offer any suggestions to improve the mode of extraction and preparation. He is also requested to state whether he knows of any process for the utilization of mica-waste by compressing it into plates or otherwise.

3. The Board learns with surprise that the spotted mica is being exported. It is believed that this is useless for electrical purposes for which the chief demand has arisen.

(True Copy and Extract.)

(Signed) R. V. SRINIVASIAR.
Secretary.

To C. S. Middlemiss, Esq, Superintendent, Geological Survey of India.

Copy to the Collector of Nellore.

Read—also the following letter from the Superintendent, Geological Survey of India, to the Secretary to the Commissioner of Revenue Settlement, Land Records and Agriculture, dated 19th March 1897, No. 155 S.—R.:—

In reply to the Board's Proceedings, Mis. No. 1798 of 10th March 1897, Resolution 2, I have the honour to observe that the extension of my term of deputation to Madras till 1900 was not consequent on Mr. Anderson's resignation (see letter from Director, Geological Survey of India, to the Government of India, Revenue and Agriculture, No. 1962, dated 19th September 1896, paragraph 3), and that therefore work proposed for Mr. Anderson (except the investigation of the corundum deposits for which special arrangements were made by the Director) does not necessarily devolve on me.

I have the honour to observe further that, as I am primarily engaged on the Coimbatore and Salem districts, the sanction of my Director is necessary for any important work outside of those districts. The superintending of the corundum workings has taken all the time I could spare from the regular survey work.

In consequence of the above, no steps have been taken by me to investigate the mica of Nellore.

With reference to the queries about the utilization of mica-waste and "spotted mica" (paragraphs 2 and 3), I have the honour to refer the Board to the Mica Handbook (Imperial Institute Series No. 19), and I also append some remarks by Mr. Holland in this connection.

"Mica waste in a compressed form has been used in the manufacture of insulators on telegraph poles (Handbook, page 4).

"Other uses of mica-waste are given on page 5. Since the Handbook was written, specimens have been shown me in Calcutta by a Mr. Jones of Howrah of sheets intended as non-conducting boiler covers and made of mica-waste cemented with clay and moulded into curved sheets. Mr. Jones stated his intention to apply for a patent for the substance so manufactured. Mica-waste has been used also as a basis for soap in Bengal.

"Apparently, one of the difficulties against the use of mica-waste for the above purposes was the power required to grind it into a powder; but lately, such of this difficulty has been removed by heating the mica and throwing it into cold water, the irregular contraction following the sudden chilling, splitting the cleavage bundles into minute films.

"The stained mica of Nellore was not in favour, because in the London market the specialists, who value the lots previous to sale, were in the habit of giving points for—

(1) Elasticity of the plates.
(2) Transparency.
(3) Freedom from crumplings.
(4) Do. from inclusions of foreign matter.

"These were considered desirable characters, evidently because most of the mica was formerly used as fine screens, peep-holes in furnaces and other places where transparency is essential. During recent years, however, the rapid exhaustion of the American mines has driven the utilizers of mica to turn their attention to what was formerly regarded as valueless. Beyond the survival of market prejudice, there appears to be no theoretical reason for objecting to the stained mica of Utkur (Vutukur) in Nellore. The minute isolated films of iron-ore ought to have no deleterious effect on the straps used in dynamos. I have seen large sheets of it which in all other respects are superior to the best which Sargent turned out at Inukurti. I am consequently not surprised to learn that the market prejudice has been broken down as a result of the increased demand for mica and that the stained mica of Nellore is now being used."

Resolution—Mis. No. 3151, dated 5th May 1897.

The papers will be submitted for the orders of Government.

2. In paragraph 4 of its Proceedings, No. 3116, dated 24th June 1896, the Board suggested that Mr. Anderson, the Mining Specialist, whom it was then proposed to post for geological work in this Presidency, should, in addition to his other work, be asked to inspect and report on the mica-mining industry in Nellore. This suggestion was approved by Government in its order, No. 3072, dated 1st August 1896. Mr. Anderson, however, subsequently resigned, and it has been arranged that Mr. Middlemiss, whose term of service in this Presidency was to expire in October 1897,

should continue to work till 1900. On a reference made to Mr. Middlemiss as to what arrangements he had made to inspect the mica mines in Nellore, that officer states that the work proposed for Mr. Anderson does not necessarily devolve upon him, that the superintendence of corundum workings in Salem and Coimbatore districts has taken all the time which he could spare from his regular survey work, and that the sanction of the Director of Geological Survey is necessary for his undertaking any important work outside those districts.

(True Copy and Extract.)

(Signed) R. V. SRINIVASIAR,
Secretary.

To the Secretary to Government, Revenue Department, with papers.

Order—Mis. No. 2816, Revenue, dated 3rd June 1897.

The Board is requested to expedite the report called for in G.O., No. 2586, dated 20th May 1897.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

To the Board of Revenue (Revenue Settlement, Land Records and Agriculture).

Read—also Proceedings of the Board of Revenue (Land Revenue), Madras, dated 23rd June 1897, Mis. No. 2275.

Abstract.—Submitting to Government Salem Collector's report regarding collection and transport of 300 tons of Kanjamalai iron-ore and recommending that Mr. Middlemiss may be deputed to visit the locality and point out the kind of ore required and the place where it can be most conveniently obtained.

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), Mis. No. 5078, dated 9th July 1897:—

Read—again endorsement from the Acting Secretary to Government, dated Ootacamund, 29th April 1897, Mis. No. 2160-Rev., and Board's Proceedings, Mis. No. 3550, dated 20th May 1897 thereon, requesting certain firms to report the market price of corundum per cwt.

Read—also the following letter from Messrs. ARBUTHNOT & Co., Madras, to the Secretary to the Commissioner of Revenue Settlement, Land Records and Agriculture, dated 28th May 1897:—

In reply to your memo., Mis. No. 3550, dated 20th instant, regarding corundum, we have the honour to inform you that there are two qualities, viz., No. 1 and No. 2. The present market price of the former is Rs. 4 per cwt., and of the latter Rs. 2 per cwt. delivered into godown here.

Resolution—Mis. No. 5078, dated 9th July 1897.

In returning the report forwarded with the endorsement read above, the Board begs to state that it learns from Messrs. Arbuthnot & Co. that the market price of corundum of the best quality, delivered into the godown at Madras, is Rs. 4 per cwt.

In Mr. Middlemiss' experiment, the cost of 1 cwt. was over Rs. 19.

Making every allowance for extra expenses due to the small scale of the experiment, it would appear that the Salem corundum cannot be extracted by hand at a cost which would admit of its being sold at a profit.

(True Copy and Extract.)

(Signed) R. V. SRINIVASIAR,
Secretary.

To the Secretary to Government, Revenue Department.

Read—also the following letter from R. D. OLDHAM, Esq., Officiating Director, Geological Survey of India, to the Secretary to the Government of Madras, Revenue Department, dated Calcutta, 6th July 1897, No. 594:—

I have received through Mr. C. S. Middlemiss, Superintendent of the Geological Survey of India, a copy of the Proceedings and Resolution of the Board of Revenue, Mis. No. 1428, dated 14th April 1897, with reference to which I would ask your consideration of the following.

2. The programme of work of the officers of the Geological Survey of India is settled annually by the Government of India after consideration of the proposals made by the Director, and any serious change in it which may afterwards be desirable ... res the sanction of the Government of India, which sanction would usually be ... ed on the recommendation of the Director.

3. In these circumstances, you will perceive that the course adopted by the Board Revenue in communicating their desires to Mr. Middlemiss instead of to the Direc... or of the Geological Survey must, to say the least, lead to delay.

4. In the present matter, I am unable to recommend the diversion of Mr. Middlemiss from the work on which he is at present engaged, as I am at present unaware of, precisely, what is desired by your Government.

5. Should this be merely the collection of samples of iron ore, the work could be done through your Revenue officials, but, if a detailed examination of the geological relations and mode of occurrence of the ores is required, this is an undertaking which will occupy a considerable part, at least, of a working season and will have to be provided for in the programme of work of the department. I would consequently request that I may be favoured, at as early a date as possible, with a full statement of the desires of your Government and whatever information may have already been collected bearing on the matter you wish to be investigated.

6. I would, however, point out that Mr. Middlemiss has already on hand both the ... survey of the Salem and Coimbatore districts and the special investigation of their ... rundum resources, and would deprecate his transfer from there, unless for a matter ... great importance and urgency. The investigation of the Kurnool iron ores may ... me under this designation, but, at present, in the absence of any special information, ... would not be disposed to regard it as such. This is in no way due, as your Board ... Revenue seems to consider, to Mr. Head's report, but to the fact that arrangements have been made for a trial shipment of ore from Salem to England. Whatever may be the result of this experiment, there can be no doubt that it will throw considerable light on the value of the ore and indirectly afford great assistance in any further investigations, and for this reason, if it be not outweighed by others, of which I have no knowledge, I would urge the postponement of further special investigations of iron ores in Madras till after the receipt of the report on the trial of the Salem iron ores.

7. I would also request that, in all cases where your Government desires any special geological investigation, for which provision has not already been made, the application may, in the first instance, be made to this office, and not to the officer deputed to Madras. You will, at all times, find this department ready to render you every possible assistance, but, as the disposition of the officers of the Geological Survey is subject to the decision of the Government of India, you will find it more expeditious to communicate with me direct than through the officer of the Geological Survey who

happens to be working in Madras. When the carrying out of any special investigation is finally decided on, he will be placed in communication with you and the arrangement of details left to him.

8. As a further reason for application being made direct to this office, I would point out that experience shows that it is not infrequently possible to meet the desire of Local Governments for information on special subjects by a reference to the records of this department without incurring the expense and delay of deputing an officer to make a special investigation.

Order—No. 846, Revenue, dated 6th October 1897.

Miscellaneous.

In 1893, the Government resolve to institute a systematic mineralogical survey of this Presidency with a view to the discovery and allocation of those mineral products which would be likely to prove of economic value. The importance of such a survey was urged on the Government of India and that Government was asked to sanction the appointment of a skilled petrologist for the purpose. After some correspondence, however, it was decided that an officer of the Geological Survey of India should be deputed to this Presidency to conduct a practical enquiry.

2. Mr. Middlemiss, the officer deputed for the purpose, has been engaged since his arrival mainly in the investigation of the corundum deposits in Salem. In 1896, arrangements were made for the employment of a mining specialist, Mr. Anderson, to practically determine the value of the corundum deposits discovered and described by Mr. Middlemiss. Mr. Anderson, however, resigned his appointment later in the year and the task of extracting and valuing the corundum was undertaken by Mr. Middlemiss with the help of a subordinate of the Public Works Department.

3. The results of Mr. Middlemiss' experiments are given in his report printed above. It is observed that the cost of excavating and cleaning 2,845 lb. of corundum was Rs. 385-2-0. The cost of 1 cwt. of cleaned corundum was, therefore, Rs. 15-2-7. The current market price of corundum is reported in the Board's Proceedings read above to be Rs. 4 per cwt. delivered in Madras. This price, however, is possibly that of corundum gathered from the surface and not thoroughly cleaned. Before giving a definite opinion therefore on the possibility of working the corundum deposits in Salem on a large scale with commercial success, the Government will await the report promised by Mr. Middlemiss on the results of the valuation and testing of the corundum extracted by him.

4. The Government, however, are decidedly of opinion that the results of the experiments made do not justify the continuance for the present of Mr. Middlemiss' investigations in Salem and Coimbatore and that his further employment in the districts would, with reference to the object of his deputation to this Presidency, be a waste of time. The Director of the Geological Survey Department will be informed accordingly with reference to the first of his letters read above.

5. In the second of his letters read above, the Director asks for a statement of the wishes of this Government as to future geological investigations in this Presidency.

6. With reference to the question of working the iron ores of Salem, this Government has recommended to the Government of India the proposal to ascertain by actual experiment the cost of working Salem iron with Barrakur coal. Should the proposal be accepted, it will be necessary to extract 300 tons of the Salem ore, and the Government would be glad to avail itself of Mr. Middlemiss' services in selecting the ore. Until the experiment is tried, the possibility of working the Salem ores profitably cannot be definitely affirmed or denied. In the meantime the Government considers it of the highest importance that ores supposed to be valuable lying nearer to the coal fields should be as thoroughly investigated as those of Salem have been. In the first of the papers read above, the importance of investigating the Kurnool iron ores has

been well represented by the Board. The Government considers that Mr. Middlemiss should be deputed to Kurnool without delay for the purpose of surveying and describing these ores.

7. With reference to the Board's suggestion that the mica mines in Nellore should be inspected by an expert in order that improvements might be suggested in the mode of extraction and preparation of the mica for the market, the Director of the Geological Survey will be asked to depute Mr. Holland for the purpose of reporting on the industry which is assuming large dimensions.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

To the Board of Revenue (Revenue Settlement, Land Records and Agriculture).
„ the „ (Land Revenue).

Exd. W. D'Mose.

70 Copies.

