1880 P.w

698 w
18.3.1880

To be printed

Minute

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

That coal exists in the Nizam's territory between the Godavery and Kistna is well ascertained and the quality of that recently obtained and tried, althoug

the

the results are not yet accuriately calculated show, that the coal is of a good useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian Coal they have in use. It becomes a question of price.

Coal is wanted for Railway and steam purposes at Madras, for the navigation of the Godavery and at Coconada, and will no doubt be also consumed on the Canal.

See map. About 1/3 of the distance between Budrachellum and Rukapilly.

It has been ascertained that coal exists on the Godavery river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godavery steamers. The quality of the coal as tested by boring with small bores is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation) the coal seams can be reached by a shaft for an amount of under 2,000 Rs, it would

be

be a matter to be tried at once without doubt, but I would put it higher, and taking the estimate above given, I would make allowance for pumping ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs 5000.

Say at No: 16 bore where the coal is

within 150 feet from surface and about 18 feet thick and the shaft only 1 mile from the river but above flood lines.

Coal in such a situation ought to be sufficient and economical for all purposes of steam engines on the river and delta and also at Coconada, as its price must be low from the freigh being entirely water and down stream so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

In

In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godavery use the cost would not be wasted.

The opening

of

of any coal operation would tend to develope and thus to pacify the country around.

The question to be decided then is

Shall Government endeavour at a cost which may reach 5000 Rs to open the coal already ascertained to exist?

If that be agreed then the Chief Engineer should suggest the arrangements and the

co-operation of
Mr Vanstavern
should be secured,
for his local knowledge and long
experience of the
District.

The working
season is from
now to June.

—"— (Signed) Buckingham
& Chandos

N. B.

The original maps
sections and memoranda should be
returned to Mr
Vanstavern, as
they are only lent
I could not leave
the copies in Government possession.
possibly lost.

Immediate

16-3-80

C. 18.3.80.

P. W. Dept

Proof of Minute submitted
for the approval of His Grace the Governor.
The Plans are being traced and the
Correspondence has been faired for security's
sake before return - but will not be used
without Mr. Vanstaveren's Consent

18th. March/80

18/3

18/3/80

Govt, and to ascertain if it will arrange for a further supply of 50 tons of coal being sent to each of the two places you mention - If it agrees to this, the matter can doubtless be arranged between the Engineers

Officials and Mr Walsh -
I think the report of the coal is fairly encouraging -
Yours very truly
R. Meade

From

Coonoor -

15 June '80.

My dear Sankey,

I have the pleasure now to return the enclosures.

I am writing to Hyderabad to send the Soundings you have sent me before the Nizam's

Copy sent [illegible] to Mr Walsh

Recorded

18/6/80

Government House

Ootacamund 26th May 1880,

Dear Colonel Sankey

With reference to your note of the 17th instant to His Grace the Governor forwarding a letter from Mr Walsh about Godaveri Coal, which letter I have now by order to return, I am desired to say that arrangements should be made for 100 tons of coal as suggested.

From

From its use the advantage and economy of Coal vs-Wood can be determined.

The steamers will probably be kept running.

Yours sincerely.

Bertie Hobart

7

29: May

My Lord Duke

From the accompanying reply just received from Sir Richard Meade in reply to a note I sent him in reference to Major Hobart's note of the 26 inst: it would appear that the Nizam's Govt. have to be written!

Priority, and should
your Grace approve
I will ask that 50
tons seed be sent by the most
direct route to the right
bank of the Godavari &
50 to Bezwada – Mr.
Walch making his own
arrangements for these
places

I presume I may
also send the information
with the arrangements
already made this
to say the ~~truths~~ & ~~[illegible]~~
are [illegible] Lent 1st already

certainly [illegible]

Believe me
Your Grace's
Obedient Servant
A. B. Hawkey

x See that in the Steamer

S. O. No 638 W
13 Inst. and
I must ask for
more detailed instructions
connected with
it — I do not even
know how to start
towards getting
Singareni Coal —
for I have no
idea of to whom
I ought to write
about it —
Is there a regular
permanent Establish-
-ments at or connected
with the mines? or

are operations only
carried on when
definite orders for
Coal are received?
Would it not be best
for the Madras
Government to ask
the Nizam's to get
(say) 500 tons
delivered on the
bank of the Godavari
informing us of its
delivery there & leaving
me to get it down —
It should be remembered,
that the running
of the upper Godavari

Dondaishwan
9/4/80-

My dear Mr Sankey.
Re your note of 2nd Inst. you tell me to let you know if there is any point connected with the coal question on which I wish for more complete instructions — I have today received

Steamers up & down the River are to be stopped (see S.O.K. 30/1/29 tb d/ 13/5/77) & therefore the only steamers we shall have for trying the coal in are our little launch & tugs — Wood for these will for many a day be the cheapest fuel here. The consumption of the workshops is very small — 2 C.y. of wood a day

Yours sincerely
Ewald

THE RESIDENCY HYDERABAD

29 May
'60.

My dear Sankey,

The coal pits at Singareny are not worked, unless for a special purpose as when 100 tons were sent to Madras for trial, and a supply could only be sent.

Sir Salar Jung has I know been looking out for an account of the results of the trial of the 100 tons sent to Madras. I hope it may be furnished.

Yours very sincly
R. Meade

be got, from them
under the orders
& arrangements of
the Nizam's Govt. —
If it is desired
to get 100 tons more
for Experimental
purposes, I have
no doubt that
the Govt. would
readily arrange
for

its supply, an
application being
made to it through
the Resident by
the Madras Govt.
with the requisite
information as to
(1) the nature & object
of the Experiments
and (2) the place
to which the coal
should

that for a full cargo
the freight to Madras
would now be about 8/-
per ton. The landing at
Madras you can add
from local information.
If it is anything like what
I have experienced there, I
can't imagine how it is
done at all. So you
see Bengal coal comes to
very nearly the same cost as
what you mention for the
Godavari coal - but then

the quality might be
a serious item in the calculation.
It is only the best quality
of Bengal coal that is used
for coking - the coke selling
at about 11/8 in Calcutta.
I do not know of any attempt
to coke the inferior coals.
Nor have I heard of any
success in this way with
the Warora coal, though
since the abandonment of
the scheme for iron works
there the attempt may have
been put aside - but the
trials in that way were made

the date of the
you refer to - but I
say whether it would
a fair trial - Mr
W. Morgan can
you all information
that point. Coking
coals having a large propor-
ash and of volatile
must always be
coking process, and
result.

Yours truly
H B Medlicott

Geological Survey o India,
Calcutta, 16 April 1880

My dear [illegible]

I am glad to hear you are trying to take up a new coalfield in the Godavari region. It's a pity that Nizam has such a large share of these rocks on his side of the river.

Damudah coal is now selling in Calcutta at 8/- 9/- & 10/- a ton according to quality.

I am told it would cost about 14 annas per ton to put it on board ships, and

---

ups to the place of
commence
tical Operations
the end of
vember or commence-
nt of December -
letter will also
told you that
think we had
tter let Dr Vanstavern
superintend the
shaft sinking, for
are too short-
handed in the
partment here to
a man for the
k, and to

---

the way I wrote
Dr Vanstavern the
day before yesterd
privately - I commen
my letter by saying
had no authority
-ever to act officia
in the matter - askin
him whether he
would like to unde
the work & if so on
what terms —
Now as regards the
sections they ref
to borings taken in
1871 and they
be copies of origina
belonging to Governm

Mr Vanslaveren then
forward to the Upper
davari Staff – & even
he did not make
ine, whoever did
must have been,
been convinced.
Government Servant
ter must at the time
ve been a report
and Mem – I
m doing my best
have all about it
, but would
ggest that you
uld see if you
must get some
rmation on
subject fr

Dowlaiswar
8th April 18

My dear Col. Sankey
My No 84 of 6
Inst. will have sho
you that I concur
that there is no ch
of the shaft bein
sunk before the ra
and I believe tha
by far the most sat
& cheapest arrange
-ment would be
closed up [illegible]
if required when
steamers can ag

Dumagudem
11/5/80

My dear Col. Sa
I have not re
ceived any reply
to my demi-offic
to you of 9th ult
about the Singa
Coal – I hope you
will find time
to answer it —
I am in official
communication
w. Vanslaveren ab

Coal Shaft
Superintendt.
t. I have some
doubts as to
g arrangement
is come to - for
I write strongly
against such works
being undertaken -

Yours sincerely

---

the Central
Province Gov
under which the
U. S. works there
Gov. and that y
should get Col. Sh
who took an [illegible]
interest in the sear
for Coal on the
Godavari & tell
what he knows o
the subject -
C. O. No 2093 - 15/
has just been
here & doubtless
the 9 boxes referred

Mr Blandford's
herewith
of the
we are now
ling with
Which Mr
Lavarra cannot
any private
Dr Oldham
King of the
gical Survey
I believe both
the plan
1871 and
doubtless
ted on the

other books -

We are necessarily
having here now
much work to be
compressed into
a short time.

Yours sincerely
Ewald

See also P.M.G.
502 . 14/5/73
632 & 18/6/73

1

Dumagudum
20 November 1879

My dear Sir,

I just received your letter dated 12th Instt: I herewith send
part. belong
my original Survey of the great bular Badrachellum in which borings have been made, and also all the Sections of the borings I sunk - These I will prepare to day - that is putting some Explanatory notes on them and despatch to you tomorrow, enclosing a "memo" of probable cost of sinking a Shaft (for

which there is a very good place) -
for the information of His Grace the
Governor

I remain &c

/Sd/ J Vanstaveren

Dumagudiem
21 Novr. 1879.

My dear Sir,

I enclose you some notes on the sinking of a Shaft. I have given all the information I can think on, but living near the spot and knowing the place, there may be some points which a stranger to the place might require some more information on. If so, and you will kindly let me know I shall be glad to give it.

Bore holes No. 27 & 28 are not marked on the section as they are about the same as No. 26. none of the bore holes were carried down deep as I was limited in piping and rods then.

When the coal was found above the basin, the place down there was not much thought of - some of the Coal was fair, others inferior as far as I remember No. 16 was about the best.

I addressed the Chief Secretary about my pension long ago, but up to date I have not received an answer, and to tell you the truth I am rather anxious about the matter.

Yours &c

(Sd) J Vanstavern.

P.S. - We are having heavy rain here and exceedingly damp weather so I trust you will excuse any [illegible]

Notes on the Coal region below Deverapilly Hill in which borings have been made -

1. Borings

All the borings sunk are marked on map and also on map of section of bore holes.

2. Soil. With the exception of boring Nos: 1 + 2 which were sunk in the vagu and No: 26 which are on rocks the rest of the holes were sunk through surface soil. no outcrops of rocks

3. Depth Depths on map are from ~~distance~~ Datum line, what~~ever~~ are on Section plan above distance has to be added.

4. Water Water was generally tapped at 30' below datum borings were carried on during the rains.

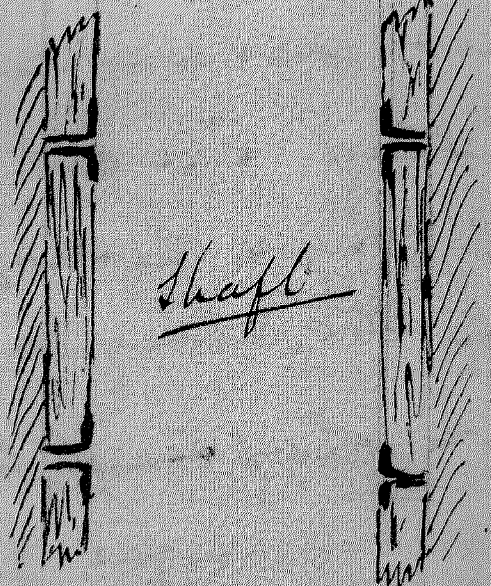
5. Soil met with It will be observed that in the Sections before striking rock or coal – the intervening soil consists of clay. some hard, and some soft. but none of it would stand during the boring without piping.

No. 6. To sink a shaft
To sink a shaft it would be necessary to secure the side or line the shaft until such time as either rocks or coal was reached that would stand. The easiest way to do this is to have the shaft round. Then the rims made of angle iron rivetted together & fit the diameter.

These rims should be made in halves – with a good shift of joints to avoid fish plates

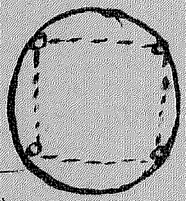
These rims should be kept about 4 feet apart, below 30' depth, above that they can be kept 5' and filled in between with 2½" planking.

Then



There is no difficulty in lining a shaft this way; as it can be carried down with the excavation

No. 7. Angle iron rims The rims can also be used for fixing the pump pipes by strong brackets fixed on the tin rims. Also should it be found necessary to fix a lift. The four side grooves can also be fitted on the iron rims, and leave the place for pipes clear.



No 8. Water in Shaft A pumping engine would be necessary as already noted on the map; the shaft tried to be sunk there could not be kept free of water

No 9. Site for sinking a shaft To sink a shaft it would be necessary to select a place above high flood level. The shaft on map was a place that would get flooded and is no criterion to go by as it was only a temporary measure to try and get some of the coal out. No site should be selected below datum line 100'. I think that No. 16 would be a good place. Evidently

No 16

No14 is a continuation of this and the gallery driven could be drawn up hill for drainage.

No:10. Road to river from pit

The ground presents not the slightest difficulty for making a single tram road to river side, wooden rails flat iron bars on top, and waggons pulled by one bullock each.

No:11. Machinery & Tools required for sinking a shaft.

Tools. all tools required for earth works or stone excavation are in store.

Lifting Winch. chains, blocks, iron tubes are either in stock here or in the Dawalaisaram Workshops, among the Upper Godavery stores.

Pumping Engine. This would be required, but as the depth is not great it can probably got from the Madras or Calcutta Arsenal or from private parties.

No12. Cost of sinking shaft The cost would consist of the labour of excavating and raising debris and the lining of the shaft and also some temporary shelter for the work men.

1st. Excavating. Soil or stone

the cost would remain the same throughout. The cost would also be the same in raising, only as the hole deepened the process would be slower and require more men.

2nd The cost of labour would be about the following — Say that the work was done in three months:

1. Labour in Excavating provided they turned out the proper quantities.

5 men on Rs 10 per month = 50.

Brought over Rs 50.

2. 5 men on Rs 8 per m = 40.

3. To attend to bucket? &c

4 men on 8 per m = 32.

4. 2. spare men in case of sickness as employing strangers for the time would not do as unacquainted with the work.

2 men on Rs 8 per mt. = 16

Blacksmith set for month = 33

Stores, steel, oil, &c, &c. = 25

Rs 196.

Say Rs 200.

which would give for 3 months 600 R

1 maistry on 50 Rs for 3 ms. 150.

The cost of the iron tins & wood work, & fixing the

Brought over 750

latter to be got here -
There is also some ample
iron and rivets in
stock here - 1000

Rs 1750.

To this amount there would have to be added the supervision and pumping machinery

sd. J. Vanstavern

Dumagudem }
21st Novr 1879 }

P.S. I did not mention the huts for the people this would probably amount to about Rs 60.

[illegible]

D. F. Carmichael

I send the accompanying Memorandum & papers respecting coal on Godavery – suggesting an expenditure in sinking a shaft on the ascertained coal seams so that the nature & quality may be fairly tested & ascertained –

Dec 9th

I entirely concur in the proposal & recommend the coal researches in the manner & at the estd. cost of Rs. 5000. as proposed by his Grace. The question is one of great

importance & I think
we can easily provide
funds from the
accumulated Cattle
Trespass fund &c.
can be recouped
when necessary if
required for the
Farm purposes
later on. L.H.D.
7/1/80.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

Mis. 698 W/18 March/80

No 698 W   P. W. Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 18 Mar/80   ~~Read the following~~

Read Minute by His Exc. the Gov. &
Notes by the Hon. Mr Huddleston.

Order.

The Revenue Dept. will arrange to place at the disposal of the P.W. Dept. the sum of Rs 5,000 from the accumulated Cattle Trespass Fund for certain experiments on Coal boring operations in the Godavari District.

2. This amount will be recouped when necessary for the Fund purposes later on.

17/3/80

Revenue Dept.
Examiner P.W. Accounts

Despd 18-3-80

1-441. B.P. Despd 11.5.80

✓ P.W/1880/Dept

Mis. A. 698 W. 18 March 1880

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

THE question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880.

(Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

THE question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari Steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

THE question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

THE question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

THE question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

THE question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

THE question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari Steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

THE question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

(Signed) BUCKINGHAM AND CHANDOS.

5th January 1880.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.

MINUTE BY HIS GRACE THE GOVERNOR.

The question of getting access to coal in this Presidency for railway and navigation purposes is a very important one.

2. That coal exists in the Nizam's territory, between the Godávari and Kistna, is well ascertained, and the quality of that recently obtained and tried, although the results are not yet accurately calculated, show that the coal is of a good, useful description, and reported by the Public Works Workshops as quite equal to the ordinary Indian coal they have in use. It becomes a question of price.

3. Coal is wanted for railway and steam purposes at Madras, for the navigation of the Godávari and at Cocanada, and will no doubt be also consumed on the canal.

4. It has been ascertained that coal exists on the Godávari river on the British side, and some coal raised from the dry bed of the river has given "good results" in the Godávari steamers. The quality of the coal, as tested by boring with small bores, is necessarily uncertain. Some is spoken of as fair, some as inferior; but it is close to the river, and the ground apparently not costly to sink in. If, as estimated by Mr. Vanstavern (who was especially employed upon the coal investigation), the coal seams can be reached by a shaft for an amount of under 2,000 rupees, it would be a matter to be tried at once without doubt; but I would put it higher, and taking the estimate above given, I would make allowance for pumping, ventilating and levelling, say that the trial should be considered as not to be effectually made under a possible Rs. 5,000. Say at No. 16 bore, where the coal is within 150 feet from surface and about 18 feet thick, and the shaft only 1 mile from river, but above flood lines.

See Map. About one-third of the distance between Bhadráchalam and Rékapalle.

5. Coal in such a situation ought to be sufficient and economical for all purposes of steam-engines on the river and delta and also at Cocanada, as its price must be low from the freight being entirely water and down-stream, so that an extra quantity might be used. How much further it could be carried can only be really known by actual test.

6. The opening of coal at this spot would doubtless stimulate the opening on the Nizam's side.

7. In ordinary times I should not hesitate to recommend the expenditure necessary to reach and test the coal seams, and even in the present times it seems to me desirable to do so. If the coal sufficed only for Godávari use, the cost would not be wasted.

8. The opening of any coal operation would tend to develope and thus to pacify the country around.

9. The question to be decided then is—

> Shall Government endeavour, at a cost which may reach 5,000 rupees, to open the coal already ascertained to exist?

10. If that be agreed then the Chief Engineer should suggest the arrangements, and the co-operation of Mr. Vanstavern should be secured, for his local knowledge and long experience of the district.

11. The working season is from now to June.

5th January 1880. (Signed) BUCKINGHAM AND CHANDOS.

N.B.—The original maps, sections and memoranda should be returned to Mr. Vanstavern, as they are only lent. I could not trace the copies in Government possession—possibly lost.