

(1) Number of pages _____
(2) Date of repair _____
(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. 2556	Press Mis.
Dated 25. 9. 1876.	

Original

Not to be folded or roughly handled

10

*Proceedings of the Madras Government, Public Works Department,
25th September 1876. No 2,556*

Read the following papers —

No 409 From W. KING, Esq, [Deputy Superintendent of the Geological Survey of India, to Major-General G. W. WALKER, R.E, Secretary to Government, Public Works Department, dated Shevaroy Hills, 4th August 1876.

I HAVE the honor to submit herewith the detailed report referred to in G O, of 25th June last, No 1,636

2 I had expected that by this time a complete section of the rocks across the field from west to east might have been ascertained ; but this has not been done, owing mainly to accidents over which Mr Vanstavern and his subordinates had no control. The boring rods are too light to reach any depth over 350 feet ; the daily progress after 250 feet was reached became extremely small from the continued falling in of the holes during the night and the consequent necessity of cleaning them out, and there was loss of rods and pumps in two holes

3 I suggested that day and night work should be adopted in order to reduce the chances of the falling in of the holes, but the District Engineer seemed to think that great difficulty and much additional expense would be incurred in carrying out the plan. It was then decided to work on, if possible, through the rains, but this has proved impracticable

4. Even under these disadvantages, however, I think there has been enough exploration to show that a good seam of coal of sufficient extent and conveniently workable is not to be looked for in the Boddadanole field, and I am therefore reluctantly compelled to advise that further trials be discontinued. At the same time it will be seen throughout my further remarks that the possibility of better coal being found is still an open problem which the Government may desire to have finally solved, yet I cannot but think that the depth at which such coal might be struck and worked for any extent would be seriously against any profitable development of the field.

5. The conditions of the trials at Boddadanole are as follow —

6. Sixteen bore-holes have been made in three lines across the field, which I proceed to detail in their order from west to east

		<i>Main Line</i>				
7	To the depth of	.	.	.	..	FT IN 236 0
6	Do	.	.	.	.	193 6
5	Do	.	.	.	.	266 4
9	Do	...	.	.	..	215 0
10	Do.	..	..	.	.	239 0
11	Do	..	..	.	.	356 0
12	Do	.	.	..	.	295 0
13	Do	..	.	..	..	251 0
14	Do	...	...	...	..	195 0

These holes are, as nearly as I could judge, across the strike of the strata ; and each hole has in most cases (being about 1,000 feet apart, and the dip of the strata being from 10° to 15° westward) at its commencement pierced beds of rock already gone through in the hole immediately to the west of it. Thus we have nearly the same, though not so direct a result, as would have been obtained had hole 7 been carried down 800 feet.

North Line

	FT	IN
2 To the depth of	229	11
3 Do	274	0

These holes are about 3,500 feet to the north of the longer line just detailed. No 2 struck strata occurring in Nos 6, 5, 9, 10, 11. No 3 is in strata lower than any in the long line, but we have these strata again in the third line to the south.

South Line

	FT	IN
4 To the depth of	200	0
8 Do	263	0
15 } Only to a short depth		
15a }		

These holes are about 3,000 feet to the south of the main line. Nos 4, 15, 15a, cut strata of Nos 11, 12, 13, 14. No 8 is in strata lower than any in the main line, but corresponding to those pierced in No 3 of the northern line

7 Six seams of shaly coal, or of clay with coaly matter, have been met with either in bore-holes 6, 5, 9, 10, 11, 12, 13, 4, 14, 8 viz. —

- a The highest in 6, 2, 5, 9, 10, 11
- b in 5, 11
- c in 10, 11, 12
- d in 11, 12, 13, 4, 14
- e in 8
- f The lowest in 8

Seam *a* is of poor shaly coal, varying from 6 to 11 feet in thickness *d* is of about the same quality, but it has not the same lateral extension. The other seams of clay with coaly matter, or with mineral charcoal and cannot be considered as coal

8 So far there is no trace of tolerably bright coal such as is met with below Dumagudiem or at Singareny in the Nizam's Dominions, the nearest coal-fields to Beddadanoie, which give a fuel about as good as that of Warora in the Central Provinces, or indeed of some of the pits at Ramgunj. The material of the Beddadanoie seams is a rather hard, dull, black shale with thin laminæ of very poor coal and showing scarcely a particle of bright coal. An assay, as already reported, gives carbon 16.4, volatile 30.6, ash 53.0. This is not in any way fitted for a fuel. The clay with carbonaceous matter is merely a dark colored or black clay with coaly particles, or there is clay with some flakes of soft powdery mineral charcoal seamed through it.

9. That part of the field tried by boring is a little more than $1\frac{1}{2}$ square miles in extent and stretches across the middle of the field, itself about $5\frac{1}{2}$ square miles in area. The main line of holes runs across the middle of the field, while the two other lines have been tried on the north and south edges of the pierced area.

10 The deepest hole, No. 11, runs down to 356 feet, at about the centre of the field, but from the successive occurrence of the strata in the holes across the strike and from the absence of marked faults or displacements, I feel sure we may fairly draw conclusions for 800 feet in depth on the western edge of the field.

11. The borings show that most of the seams, such as they are, and their associated clays, are tolerably continuous over the area examined, and that they do not improve in quality as they are traced to the deep, or to the westward, nor do they improve to the north or south where the holes on the edges of the tried ground are situated.

12 Such being the condition of the seams in the middle of the field, I do not see any reason to expect that at the same depths there can be improvement in the quality of the seams in the unpierced area to the north and south; nor again, should there be any improvement unless indeed it were most marked, do I think that the area remaining on either side would hold a sufficient quantity of fuel to make it worth working

13 I now proceed to consider the quality of the seams in the depths attained in the tried ground. On the eastern edge of the field, where the highest strata are exposed, we have got down, in hole 7, to 286 feet, without meeting any seam. At 1,500 feet further east, hole 6 passes at first through about 40 feet of strata answering to strata at the bottom of hole 7. It then runs down for 137 feet 6 inches cutting through seam *a*, which is also met with in holes 5, 9, 10, 11. The tendency of this seam to extend westward is evidenced by the holes just mentioned, and its average dip is a little less than one in five in the same direction. It should therefore lie under the site of hole 7 at about 137 feet 6 inches below the 286 feet already attained there, that is, at a depth of 430 feet below the surface

14. Pursuing these calculations and going still further eastward through all the holes in the main line, I see no reason to doubt that seams *b*, *c*, *d*, or the bands of clay in which they occur, might not be found in hole 7 were it deepened

15 Thus, getting to lower and lower seams in the series, as the lines of holes are followed eastward, we come to *e* and *f*, the latter the lowest of all being struck in hole 8, where the bed rock (gneiss) was touched which is on the eastern edge of the field

This seam was struck at 237 feet, and it would, if of any extent, be at 625 feet under the site of bore-hole 11 in the centre of the field, and at 850 feet under hole 7 on the western edge. These depths are obviously too great for the excavation of inferior coal.

16 Hence I am led to assume that if there be any fuel of good quality on the eastern side of the field, it must lie deeper than 300 feet. There can be none on the edge, under hole 8, for there we have struck the floor, but if, as is probable, the floor-shelves, there would be room for lower strata further west underneath those in the middle of the field

17. These calculations are for the area tried, but as the lie of the rocks to the north and south is very much the same as here, we may assume the untried area does not contain good coal at lesser depths than those where it is found in the bored region.

18. Next, as to the probability of finding good coal at greater depths, it may be noted that there are only two seams of what can be called coal, viz, *a* and *d*, and the shaly coal from these, in whatever bore-hole they have been struck, is about the same in quality.

19 The topmost seam *a* is 11 feet thick in hole 2, 6 feet 7 inches in 5, 6 feet 8 inches in 6, 2 feet in 9, 7 feet 6 inches in 10, 7 feet 3 inches in 11 for this field, a tolerably constant thickness. Below this come seams *b* and *c* mere bands of clay, with from one to four thin seams of very poor shale, carbonaceous matter, or flakey mineral charcoal which do not improve as they run to the deep

20. Still lower comes seam *d* showing in hole 11 as a mineral charcoal band, in 12 as carbonaceous clay and mineral charcoal, in 13 as clay with mineral charcoal and shale, in 4 as clay with mineral charcoal shale, and 4 feet 6 inches of shaly coal, in 14 as clay with mineral charcoal and shale. These details prove that seam *d* is a very irregular band of clays, being of varying thickness, and showing much difference in its coaly nature. Still I think there can be little doubt but that it is one and the same belt. The shale and shaly coal struck in holes 13, 4, 14, are of nearly the same quality as those of the assay, but vary much in thickness, and evidently die out to the west ward not being found in 11 and 12

21. The next hole, No 8, was started in strata below seam *a*, and after running down for 180 feet, only mineral charcoal and clay for 6 feet was struck; and then, at 237 feet, 6 feet more of the same kind of deposit occurred, after which the floor of the field was touched at 263 feet.

22 In brief, we have high up in the series a thick seam *a* of shaly coal, which is tolerably constant over a fair portion of the area tried; below, another seam *d* of shaly coal, which, though of the same quality as the higher one, shows distinct signs of becoming thinner and poorer as it is traced laterally, and for 263 feet lower still there are merely bands of clay with mineral charcoal. That is to say, the quality of the seams does not improve, the deeper they are found in the series of coal measures the better seam; such as it is, being in the upper part of the series. And here I beg to refer the Government to my previous resumé of the Beddadanole work (No 21, dated 12th August 1874,) as to the probable prevalency of seams of coal in the upper beds, an opinion based on the experience of my colleagues.

23. There being, then, no indications of better coal in the lower part of the series, we might look for it in higher and higher strata, if they could only be got at conveniently, that is further to the westward. But hole 7 is on the very edge of the exposed strata of *Barakars* (lower coal-measures of India) at this side of the country. In fact, for some 50 feet below the surface, this hole passes through sandstones which I take to belong to the series (*Kamthis*) overlying the coal-bearing sandstones (*Barakars*). Again the country to the westward of hole 7 is all made up of these overlying rocks and the land rises rapidly. It is of course quite possible that higher and higher beds of the coal-measures are overlaid by the *Kamthis* rocks of the westward country, but the depth which would have to be pierced through these *Kamthis* (at say 1,000 feet) to the west or even further would, I fear, be too great to justify the work on the mere chance of finding good coal. At the same time, if the Government decide to hazard further exploration, it would to my mind be more advisable to try higher strata of the coal-measures by boring down through the *Kamthis* to a good depth, than to try deep boring in the field itself.

24. I will now briefly recapitulate the conclusions at which I have arrived—

1st—Notwithstanding the comparative constancy of bands of clay over the area tried, there are only two seams at all worthy of the name, and the coal they contain is not fit for fuel, nor does it improve towards the deep

2nd—The rocks and their lie being about the same over the whole field, very much the same style of seams may be expected at nearly the same depth in the tracts to the north and south of the tried area.

3rd—The better seam of coal being high in the measures, and there being a decrease in the quality and extent of the seams at lower levels, superior coal is not to be looked for at greater depths

4th—The chance of finding good coal by boring through the thick non-coal-bearing rocks to higher measures, is not such as to justify the expense of the undertaking

No 409-A From Lieutenant D McNEIL CAMPBELL, R E, Executive Engineer in charge Godavery District, to Major-General G W WALKER, R E, Secretary to Government, Public Works Department, dated Dowlaishweram, 28th August 1876, No. 1,488

With reference to G O, No 1,731, of the 7th July 1876, I have the honor to forward herewith copy of a report from Mr Vanstavern on the state of the coal-boring tools

2 From the report it will be seen that it is proposed to proceed with three bore-holes and, after these have been completed, another is to be decided on by Mr King as a last resource

3 Further, as regards the tools, that for the present those at the coal-field are sufficient; but should extensive boring have to be undertaken, the old tools will have to be repaired, and probably some new rods will be required

From T VANSTAVERN, Esq, Executive Engineer, Dumagudiem Division, Godavery District, to Lieutenant D McNEIL CAMPBELL, R E, Executive Engineer in charge Godavery District, dated Dumagudiem, 21st August 1876, No 308

With reference to your endorsement, No 1,361, dated 18th August, on G O, No 1,731, dated 7th July 1876, I have the honor to inform you 1st, that No 14 bore-hole has to be deepened, No 15 failed on account of the valve bucket breaking, and a new hole will have to be commenced, after that No 16 has to be bored. 2nd, Mr King states in his letter that after these three holes have been completed, he will decide on No 17 as a last resource. 3rd, to complete these holes, that is two at a time, the tools that are in working order are sufficient, should, however, extensive borings have to be undertaken, the old tools will have to be repaired, and probably some new rods required. 4th, these repairs will have to be done in Madras, as by Major Beatty's letter to me on the subject, they could not be done at Dowlaishweram

No 410 ORDER THEREON, 25th September 1876, No 2,556.

CIVIL WORKS, No 27-A

HIS GRACE the Governor in Council is clearly of opinion that it is unnecessary to continue the borings. But the question of sinking a small shaft to the upper coal-seam and raising some for actual trial may be

Proceedings of the Madras Government, Public Works Department,
25th September 1876. No. 2,556

worth considering He desires therefore that Mr Vanstavern may be instructed to prepare an estimate for sinking such a shaft in the neighbourhood of whichever of the holes 6, 5, 9, 10 or 11 may be selected by Mr. King for the purpose, and for raising and conveying to Dowlaishwaram a few tons of the coal of stratum a.

(True Extract)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

To the District Engineer, Godavery
" Public Department
" Consulting Engineer for Railways.
To Mr. King

No 308

Dumagued

21st August

15
will
copy

From
The Executive Engineer
Dumagued Division
To

The Executive Engineer
Incharge Godavery District.

Sir,
With reference to your endorsement
No 1361 dated 18 August On G.O. No 1731 dated
7 July 76 I have the honor to inform you.
That No 14 bore hole has to be deepened.
No 15 failed on account of the valve bucket
breaking, and a new hole will have to be com-
menced after that, No 16 has to be bored.

2/ Mr King states in his letter that
after these three holes have been completed,
he will decide on No 17 as a last resource.

3/ To complete these holes, that is two
at a time, the tools, that are in working order,
are sufficient; should however, extensive
borings have to be undertaken, the old tools

will

have to be repaired, and probably some
new rods required.

4/. These repairs will have to be done in
Madras, as by Major Beatty's letter to me
on the subject, they could not be done at
Dowlaisheeram

Have you seen

Signed, J. Vanstaveren

Executive Engineer

Dumagudem Dist. G. O.

True Copy

J. W. Campbell Lieut. R.E.

Executive Engineer in charge Godavry Dist.

Comp H.

P.W.D.

4 EP 76

No. 1488

No. 1488

District Engineer's Office G.O.

Dowlaisheeram, 20 August 1876

From

Lieut. D. McNeil Campbell R.E.

Executive Engineer in charge Godavry Dist.

Major General G. W. Walker R.E.

Secretary to Government P. W. Dept.

Madras.

Sir,

With reference to G. O. No 1731 of the 7th
July 1876, I have the honor to forward herewith
copy of a report from Mr. Vanstaveren on the
state of the Coal boring tools.

2 From the report it will be seen that it
is proposed to proceed with three Boreholes and
after these have been completed, another is to
be decided on by Mr. King, as a last resource.

3 Further, as regards the tools, that for
the present, those at the Coal field, are
sufficient, but should extensive boring have
to be undertaken, the old tools will have to
be repaired, and probably some new rods
will be required.

I have the honor to be

Sir,

Your Most Obedient Servant

J. M. W. Campbell Lieut. R.E.

Executive Engineer in charge Godavari

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

...

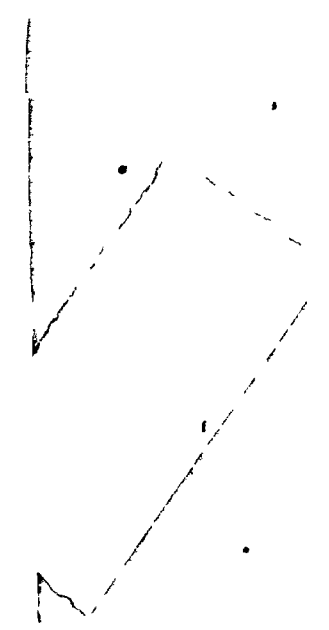
...

...

...

J.M.W.

15
11C



8012-5-76 N: 1199
 7-7-76 - 1731
 5 June / 76 - 1890 H392
 28 June / 76 - 1636
 5 July / 76 - 1687

P.W.D.
 42EP76
 NR 5722



being operations at -
 towards copy of a letter from
 Mr. J. Antonsen on the
 state of the tools and
 the workings to be under-
 taken in the neighbourhood.

From
 The Executive Engineer
 in Charge Godavari &
 the Secretary to Government
 P.W.D.
 to Mr. Madras
 Dated 20th August 1876
 Recd 11th 3 August 1876

1.
 The work has been done
 in the neighbourhood of the
 works, and the results
 are as follows - The
 work has been done
 in the neighbourhood of the
 works, and the results
 are as follows - The

NX

130C

Office of the Dy. Superintendent
 Geological Survey of India
 Shervoy Hills 4th Aug 1876

From,

Mr. J. H. Squire
 Deputy Superintendent
 Geological Survey of India

To

Major Genl. G. H. S. S. S.
 Secretary to Government
 Public Works Dept.

Sir,

I have the honor to submit
 herewith the detailed report referred to in
 GO of 28th June last, N: 1636.

2. I had expected that, by this
 time, a complete section of the rocks across the
 field from west to east, might have been
 ascertained, but this has not been done, owing
 mainly to accidents over which Mr. Van Lave-
 ren and his subordinates had no control.
 The boring rods are too light to reach any
 depth over 350 feet; the daily progress after 250
 feet was reached became extremely small from
 the continued falling in of the holes during
 the night and the consequent necessity of
 cleaning them out; and there was loss of
 rods and pumps in two holes.

3. I suggested that during the night

2)

work should be adopted in order to reduce the chances of the falling in of the holes, but the District Engineer seemed to think that great difficulty and much additional expense would be incurred in carrying out the plan. It was then decided to work on if possible, through the rains but this has proved impracticable.

4. Even under these disadvantages however, I think there has been enough exploration to show that a good seam of coal of sufficient extent and conveniently workable is not to be looked for in the Beadandanda field, and I am therefore reluctantly compelled to advise that further trials be discontinued. At the same time, it will be seen throughout my further remarks that the possibility of better coal being found is still an open problem which the Government may desire to have finally solved, yet I cannot but think that the depth at which such coal might be struck, and worked for any extent, would be seriously against any profitable development of the field.

5. The conditions of the trials at Beadandanda are as follows

1. Sixteen bore holes have been

(3)

made in three lines across the field which I proceed to detail in their order from West to East.

Main Line

(7)	to the depth of	286' 0"
(6)	"	193' 6"
(5)	"	265' 4"
(9)	"	215' 0"
(10)	"	239' 0"
(11)	"	356' 0"
(12)	"	295' 0"
(13)	"	251' 0"
(14)	"	195' 0"

These holes are, as nearly as I could judge, across the strike of the strata; and each hole has in most cases (being about 1000' apart, and the dip of the strata being from 10° to 15° westward) at its commencement pierced beds of rock already gone through in the hole immediately to the west of it. Thus we have nearly the same, though not so direct a result, as would have been obtained had hole (7) been carried down 800 feet.

North Line.

(2)	to the depth of	229' 11"
(3)	"	274' 0"

These holes are about 2500 feet to the north of the longer line just detailed. No (2) struck strata occurring in No (6) (5) (9) (10) (11). No (3) is in strata lower than any in the long line, but we have these strata again in the third line to the south.

South Line.

(1) to the depth of 200' 0"

(8) " " 263' 0"

(15)

(15a) } only to a short depth

These holes are about 3000 feet to the south of the main line. No (1) (15) (15a) cut strata of No (11) (12) (13) (14). No (8) is in strata lower than any in the main line, but corresponding to those pierced in No (3) of the northern line.

7. Six seams of shaly coal, or of clay with ~~shaly~~ matter, have been met with either in two holes (6) (5) (9) (10) (11) (12) (13) (14) (14) (8); viz:-

(a). the highest in (6) (2) (5) (9) (10) (11).

(b). " (5) (11).

(c). " (10) (11) (12).

(d). " (11) (12) (13) (14) (14).

(e). " (8).

(2) the lowest in (8).

seam

174

Seam (a) is of poor shaly coal, varying from 5 to 11 feet in thickness. (d) is of about the same quantity, but it has not the same lateral extension. The other seams of clay with coaly matter, or with mineral charcoal and cannot be considered as coal.

8. So far; there is no trace of tolerably bright coal, such as is met with below Durnagudum, or at Singareeny in the Nisanis Domains, the nearest coal fields to Hedda dand, which give a fuel about as good as that of Warora in the Central Provinces, or indeed of some of the pits at Raniganj. The material of the Hedda dand seams is a rather hard dull black shale with thin laminae of very poor coal and showing scarcely a particle of bright coal. An assay, as already reported, gives Carbon. 16.4, Volatile. 30.6, Ash. 53.0. This is not in any way fitted for a fuel. The clay with carbonaceous matter, is merely a dark-colored or black clay with coaly particles; or there is clay with some flakes of soft powdery mineral charcoal seams through it.

9. That part of the field tried by boring is a little more than one and a half square miles in extent and stretches across

6)

the middle of the field, itself about $5\frac{1}{2}$ square miles in area. The main line of holes runs across the middle of the field while the two other lines have been tried on the north and south edges of the fenced area.

10. The deepest hole, No (11), runs down to 286 feet, at about the centre of the field, but from the successive occurrence of the strata in the holes across the strata and from the absence of marked faults or displacements, I feel sure we may fairly draw conclusions for 800 feet in depth on the western edge of the field.

11. The borings show that most of the seams, such as they are, and their associated clays, are tolerably continuous over the area examined, and that they do not improve in quality as they are traced to the deep, or to the westward. Nor do they improve to the north or south where the holes on the edges of the tried grounds are situated.

12. Such being the condition of the seams in the middle of the field, I do not see any reason to expect that at the same depths there can be improvement in the quality of the seams in the unfenced area to the

190¹⁴

North and South. Nor, again should there be any improvement unless indeed it were most marked, do I think that the area remaining on either side would hold a sufficient quantity of fuel to make it worth working.

13. I now proceed to consider the quality of the seams in the depths attained in the trial ground. On the eastern edge of the field, where the highest strata are exposed, we have got down, in hole (7), to 286 feet, without meeting any seam. At 1500 feet further east, hole (5) passes at first through about 40 feet of strata answering to strata at the bottom of hole (7). It then runs down for 137' 6" cutting through seam (a), which is also met with in holes (5) (9) (10) (11). The tendency of this seam to extend westward is evidenced by the holes just mentioned, and its average dip is a little less than 1 in 5, in the same direction. It should therefore be under the site of hole (7) at about 137' 6" below the 286' already attained there, that is, at a depth of 430 feet below the surface.

14. Pursuing these calculations and going still further eastward through all the holes in the main line, I see no reason to

8)

doubt that seams (b) (c) (d) in the bands of clay in which they occur, might not be found in hole (7) were it deepened.

15.

Thus, getting to lower and lower seams in the series, as the lines of holes are followed eastward, we come to (e) and (f) the latter, the lowest of all, being struck in hole (8) where the bed-rock /quartz/ was touched which is on the eastern edge of the field.

This seam was struck at 237 feet, and it would, if of any extent, be at 625 feet under the site of hole (11) in the centre of the field, and at 850 feet under hole (7), on the western edge. These depths are obviously too great for the excavation of inferior coal.

16.

Hence, I am led to assume that if there be any fuel of good quality on the eastern side of the field, it must lie deeper than 300 feet. There can be none on the edge, under hole (8), for there we have struck the floor; but if as is probable, the floor shelves, there would be room for lower strata further west underneath those in the middle of the field.

17.

These calculations are for the area tried, but as the lie of the rocks to the north and south is very much the same as here, we may assume the untried area does

21✓(9)

does not contain good coal at lesser depths than those where it is found in the bored region.

18.

Next, as to the probability of finding good coal at greater depths, it may be noted that there are only two seams of what can be called coal, viz (a) and (d), and the shaly coal from these, in whatever bore-hole they have been struck, is about the same in quantity.

19

The topmost seam (a) is 11 feet thick in hole (2), 6' 7" in (5), 6' 8" in (6), 2' in (9), 7' 6" in (10) 7' 3" in (11) for this field, a tolerably constant thickness. Below this, come seams (b) and (c) mere bands of clay, with from one to four thin veins of very poor shaly, carbonaceous matter, or flaky mineral charcoal which do not improve as they run to the deep.

20.

Still lower comes seam (d) showing in hole (11) as a mineral charcoal band, in (12) as carbonaceous clay and mineral charcoal, in (13) as clay with mineral charcoal and shale, in (14) as clay with mineral charcoal shale and 4' 6" of shaly coal, in (14) as clay with mineral charcoal and shale. These details prove that seam (d) is a very irregular

10)

band of clays, being of varying thickness, and showing much difference in its composition. Still, I think there can be little doubt but that it is one and the same belt.

The shale and shaly coal strata in hole

(13) (14) (15) are of nearly the same quality as those of the valley, but vary much in thickness, and evidently due only to the location, not being found in (11) and (12).

21. The next hole (16), was started in strata below (15), and after running down for 180 feet, only minerals of coal and clay for 6 feet, was struck; and then, at 237 feet, 6 feet more of the same standard deposit occurred after which the floor of the field was reached, at 263 feet.

22. In brief, we have high up in the series a thick seam (a) of shaly coal which is tolerably constant over a fair portion of the area tried; below, another seam (b) of shaly coal, which, though of the same quality as the higher one, shows distinct signs of becoming thinner and poorer as it is traced laterally; and for 263 feet lower still, there are merely bands of clay in the mineral charcoal. That is to say, the

23

quality of the seams does not improve, the deeper they are found in the series of coal measures, the better seam, such as it is, being in the upper part of the series. And here I beg to refer the Government to my previous remarks of the Beddande mine (No 21 dated 12 August 1874), as to the probable prevalence of seams of coal in the upper beds; an opinion based on the experience of my colleagues.

23. There being, then, no indications of better coal in the lower part of the series, we might look for it in higher and higher strata, if they could only be got at conveniently; that is further to the westward. But hole (17) is on the very edge of the exposed strata of Parakur (lower coal-measures of India) at this side of the country. In fact, for some 50 feet below the surface, this hole passes through sandstones which I take to belong to the series, Tamir / overlying the coal-bearing sandstones of Parakur. Again the country to the westward of hole (17) is all made up of these overlying rocks and the land rises rapidly. It is, of course quite possible that higher and higher beds of the

coal measures are overlaid by the Tam the rocks of the westward country; but the depth which would have to be forced through these Tam (at least 1000 feet) to the west or even further would, I fear, be too great to justify the work on the mere chance of finding good coal. — At the same time, if the Government decide to hazard further exploration, it would to my mind be more advisable to try higher strata of the coal-measures by boring down through the Tam to a good depth, than to try deep boring in the field itself.

24. I will now briefly recapitulate the conclusions at which I have arrived.

1. Notwithstanding the comparative constancy of bands of clay over the area tried, there are only two seams at all worthy of the name, and the coal they contain is not fit for fuel, nor does it improve towards the deep.

2. The rocks and their lie being about the same over the whole field, very much the same style of seams may be expected at nearly the same depth in the tracts to the north and south of the tried area.

3. The better seam of coal being high in the Measures, and there being a decrease in the quality and extent of the seams at lower levels, superior coal is not to be looked for at greater depths.

4. The chance of finding good coal by boring through the thick non-coal-bearing rocks to higher measures, is not such as to justify the expense of the undertaking.

I have the honor to be
Sir

Your most obedient servant

William A. Rieg
Supt. M. I. B.
Petroleum Survey of India.

30.12 May/76 No 1199
 26 May — 1322 + 1323
 5 June — 1390 + 1392
 28 June — 1636
 5 July — 1687
 7 July — 1731
 2 July/74 - 1777
 21 July/74 - 1953

P.W.D.

27 SEP 76

No 6631

5 mm.

W. King Esq

Undid. 4th Aug 76.

2 Plans submitted

Report on Coal boring operations at Boddabaka - note. for every Drt.

No 409

Cri - 19-8-76 Peta 25-9-76
 Ch. Shet 16 Aug

PUBLIC WORKS DEPARTMENT.

296

Letter from W. King Esq. Deputy Supt.
 Geological Survey of India 4th Aug 1876.

FOR ORDERS.

Major Genl. R.E.
 Secretary to Govt. P.W.D.

It is clear that with present
 appliances it is no use to
 continue the boring. I think
 the question of boring of
 sinking a small shaft to the
 coal seam and raising some
 or actual trial use. may
 be worth considering - and that
 the expense should be estimated
 I think also the particulars
 of the Brighton coal seam with
 below Denagoodrum should be
 reported. In the want of fuel
 be N.W. purposes. is rapidly
 increasing

I think it is
 further boring. It
 seems evident that
 such a shaft as the
 may be with a
 spray working

Dec. 19/9

M2C
 207

FOR ORDERS.

31/18

No 2556

Public Works Department

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 25th Sept 1876
Read the following —

Letter from W. King Esq.
Dy. Supt. Geological Survey
of India
Ex: Eng. in charge of Godavari &c

(M.O. dated 14th Aug 1876)
(No 1488 of 28th —)

His Grace the Gover-
nor in Council is clearly
of opinion that it is un-
-necessary to continue
the boring. But the question
of sinking a small shaft
to the upper coal seam
and raising some for
actual trial may be
worth considering. He
desires therefore that Mr.
Vandavean may be in-
-stanced to prepare an
estimate for sinking such
a shaft in the neighbour-
-hood of whichever of the
holes 6, 5, 9, 10 or 11 may be
selected

6931
6376

23
28/9
23/9

March 22 '11

310

Selected by Mr King for
the purpose, and for
raising and conveying
to Doi Laichewaw.
Tons of the coal of the
-sum (a)

Mr

No 409-410

Head

B. E. Goddard ✓
B. E. Goddard ✓
C. E. Goddard ✓
Mr King ✓
Des. Feb 13/10/11

21C

6931/1876

Gobt. of Madras.
PUBLIC WORKS.

To

^{33C}
The R. B. Godavery

Dated

Issued

Recd

Encl

G. O., 25th 1876, No. 2546

Nos. 409-410

Sub. to G.O. 2546
14-10-76

Coal Boring operations
Godavery R. Express.
:ing opinion that it is
unnecessary to continue
the — and desiring
that an Estimate may be
prepared for sinking a
small shaft to the upper
Coal seam and raising
Coal for actual trial —

Handwritten initials