M.R.O. 1—10,006—28-2-50

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MADRAS RECORD OFFICE

Government of Madras

Public (Sanitary) DEPARTMENT

G.O. No. 2714 Press

B.P. No. Mis:

521-522

Dated 24-9-1874 195

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department, 24th September 1874.

No. 521. Read the following endorsement of the Acting Chief Secretary, dated Ootacamund, 21st August 1874:—

From W. KING, Esq., Deputy Superintendent of the Geological Survey of India, to the Honorable D. F. CARMICHAEL, Acting Chief Secretary to Government, Madras, dated Calcutta, 12th August 1874, No. 21.

I HAVE the honor to forward the following report on the coal-boring explorations under my direction at Beddadanole in the Godavery District.

2. Up to this date I have not received directly any of the Proceedings of the Madras Government on the subject since the despatch of my preliminary letter to the Secretary to Government of Madras, Public Works Department, dated 6th of June 1874, No. 20.

3. On seeing copies of these Proceedings in the daily papers I wrote to Colonel G. W. Walker, asking for them, and that a packet of specimens from the Beddadanole coal-field, which had been despatched to Madras, should be sent up to me for examination.

4. Colonel Walker then supplied me with the required copies of these Proceedings, and on the 8th instant the box of samples reached me.

5. The result of the coal explorations so far is that four seams of coal, or carbonaceous shale, have been struck in the field; one of these in bore-hole No. 2, and three in No. 4. There is a little discrepancy between the lists of strata in the bore-holes given in Mr. Vanstavern's report and the specimens now sent up; but practically this does not alter the case. There are four specimens marked as *coal*, while, in the bore-hole lists, they are given as "shale with coal" in No. 2, "shale and coal," "clay with mineral charcoal," and "coal" in No. 4.

6. The four specimens of coal are all dull and earthy; that from the 4½ feet seam being the best looking, the others are more or less associated with clay and shale. Nevertheless the fact remains that there are four seams with coal in them, thick and poor coal in one, and thin and poorer coal in the others. It is possible that each of these seams may be greatly better in quality and thickness in other parts of the field.

7. On a private application to Mr. Vanstavern, after I had heard that the specimens had been sent down to Madras, he sent me a sample of the lower two feet of the thick seam, which is evidently the better part of the deposit. An assay of this sample, made in the Survey laboratory by my colleague Mr. Tween, gives the following result:—

	Carbon	16·4
	Volatile	30·6
	Ash	53·0
		100·0
As a coke		
	Carbon	22·5
	Ash	77·5
		100·0

8. At first sight the large per-centage of volatile matter indicates a fair gas coal, but Mr. Tween tells me that there must be from 12 to 14 per cent. of mois ture included in the volatile element. Thus it is emphatically a poor coal.

9. The samples forwarded from Madras are evidently inferior to that assayed, and are not therefore worth examination.

10. The remaining specimens forwarded are clays, a piece of the "sandstone with pyrites," and the rock of the "last cut" in No. 4 bore-hole which, owing to its hardness, practically stopped Mr. Vanstavern, and led him to look on it as a metamorphic rock, that is that he had reached the floor of the field. Among the clays there is a very dark grey variety, which my friend Mr. Hughes of the Geological Survey recognises as similar to some of the fire-clays he has met with in the Raniganj coal-fields.

11. The rock of the "last cut" is not really so hard as it appears to be in the bore-hole when examined as a hand specimen, and it is easily pounded down to a fine powder of clayey constitution, without any appreciable calcareous matter in it. It is a rock of brownish-green color, consisting of minute granules of darker substance in a pale green paste, the surface being roughened with these granules; and it is evidently a form of volcanic rock approaching perlite, or perhaps an ash-bed. In its mottled appearance it is not unlike "snake stone" or "Water of Ayr stone." It is impossible to say whether it is associated naturally with the sand-stones and clays, *i.e.*, as a boulder, or as an intercalated bed. This can only be found out by further borings, or, as is advisable, by a further attempt to pierce it in No. 4.

I do not think it can be considered as a rock forming the floor of the coal-field.

12. As previously stated in my paper on this field, the beds are all, on the average, dipping about 10° west south-west except in the northern part of the field, where they are N. W., thus having a strike N. N. W.—S. S. E, and then N.E, and, therefore, had the bore-holes been put down in lines starting from the eastern side of the field and going westward, we should gradually have got through the whole thickness of strata. The work was not commenced till very late in the season, and thus I wished, if possible, to get at coal at once. With this intention, and in the hope that the river itself might hide strata in which were seams of coal, I instructed Mr. Vanstavern to begin on the river near the village. The first bore-hole was a failure. No. 2 bore-hole was then put down and carbonaceous shale was got in it; but it had to be stopped owing to falling in of clays and want of piping. To get lower than we had done in No. 2 it was necessary to look eastward, but no suitable place showed until in the nullah to the north of the village, and this would be in strata much below those examined in No. 2. Still an idea could be got from No. 3 of the lowest beds in this line, and as is shown in the list, they are all sandstones of good thickness with fewer and thinner clays than in the other bore-holes, but without the slightest trace of coal.

13. By these two bore-holes—in the line from No. 2 to No. 3—we know of 229 feet in No. 2, below which there is an unexamined thickness of strata of about 250 feet, when the beds at the top of No. 3 bore-hole ought to be reached. That

Proceedings of the Madras Government, Public Works Department,
24th September 1874.

is, supposing that the lie of the strata is tolerably uniform over the field and that there is not an irregular floor.

14. On seeing that No. 3 was not likely to produce any favorable result, and that it was becoming a troublesome hole, I suggested that a convenient spot should be selected to the south of the village in the nullah on that side, as I thought we should here be in the continuation of the unexamined beds between No. 2 and No. 3, and it is in these that the three other seams have been found. In other words, I expect that these seams would be found at very nearly the additional depth below the 229 feet of No. 2. This would of course be at an inconvenient depth for boring, more especially as the extent of the seams can be ascertained by other short holes.

15. Bore-hole No. 4 has not yet told all that may be made out from it if the hard "ash" rock can only be pierced, for there are still some few feet to be got through before reaching beds corresponding to those at the surface of No. 3.

Otherwise, another bore-hole should be put down about 400 yards back, *i.e.*, eastward and in the nullah south of the village.

16. I examined the different streams in the field even more closely than hitherto, and saw that the strata seem to lie in a very regular succession at angles varying from 10° to 15°; the dip, if any thing, becoming easier to the westward, of the main stream, as also to the N. W. where the beds are nearly flat and with fewer undulations, so that the thickness of the whole field is much more than I at first concluded. There is thus more room for seams over the western half of the field. Indeed, from this greater thickness I am more inclined to expect a greater extension of the coal-measures under the Kamthi sandstones of Namiapolliam to the westward.

17. With regard to the coal in these measures, that now known to exist is on the eastern edge of the field, and it is reasonable to expect that the seams go on thickening with the strata, or that there are more seams.

18. There is about the same area of coal-measures exposed on the western side of the main stream, but the strata here are all higher than those on the east side. No borings have been put down in these upper beds, but they are just as promising in their characters as those below. Indeed, my colleagues who have worked in the other coal-fields of India have observed that seams are more prevalent in upper beds of the Barakars. The lie of the strata on the right bank of the river is also somewhat easier, so that if coal be found on this side the probability is that the trial borings will not vary much in depth as they are carried out further west or north-west.

19. It is, however, very premature as yet to try and reckon on what may be from the few indications obtained so far; for where, as is evidently the case here, there is only an outlying patch of the coal-measures, not an area left so much by denudation as merely the filling in of a detached basin by a formation which was existent only in an attenuated condition, the occurrence of coal to a greater or lesser extent in each patch is a question attended with a great deal of uncertainty. There may be only a few seams as at Kamarum, or many seams as at Singareny in the Nizam's Dominions; or seams hardly any of which are continuous in different bore-holes as in the British field below Dumagudium.

20. The main and first thing to be done now is to continue No. 4 bore-hole, or to sink a fresh one to the eastward of that, as suggested above, and then to work down the nullah to the main stream; after that, the nullah on the other side of the field higher up the main stream, and coming from Namiapolliam, ought to be tried. This latter examination would tell if the poor seam in No. 2 hole is of any extent. It would certainly be premature to try any of the ground south of the tributary nullah near bore-hole No. 4 until more is known concerning the succession of the seams now struck.

21. In conclusion, it is necessary, from my views of the relations of the strata in this field, to remark on two passages in the Government Order, No. 1,953, of the 21st July. It is therein stated:—"But the very slight indication of shale and coal found about 30 feet above the coal deposit in No. 4 may be analogous to that of No. 2, with which it agrees in the strata immediately over and underlying." My observations do not bear out this analogy; for, unless unforeseen accidents—of which there is no indication in the adjacent nullah sections—have interfered with the normal position of the strata, everything seems to lead to the conclusion that the beds of No. 4 are lower than those of No. 2. Besides, if the upper seam in No. 4 be analogous to that of No. 2, it is difficult to account for the non-occurrence of the 4½ feet seam in No. 2, which is the deeper bore-hole.

22. There is then the further statement that "the conclusion arrived at to bore next season to the south and west seems a correct one." On this point it will be seen from this letter that I do not advocate such a procedure; but to keep for the present rather to the north and north-west as soon as the west side of the field is taken up. But, apart from this, I would respectfully submit that a conclusion as to the future sites of bore-holes ought more properly to be based on the recommendation of the Geologist, as long as he is not absolved from the office of advising, as to the possible *locale* of the coal. In this, however, it is not for a moment implied that there is any likelihood of a difference of opinion between Mr. Vanstavern and myself on the mode of pursuing the work; on the contrary, I have to thank him for having always so willingly co-operated with me.

TRANSFERRED to the Public Works Department for disposal.

(Signed) D. F. CARMICHAEL,
Acting Chief Secretary.

No. 522. ORDER THEREON, 24th September 1874, No. 2,714.

CIVIL WORKS, No. 43.

CARE will be taken in future to supply Mr. King with all papers relating to the coal-boring operations which are being carried on in the Godavery District; and the District Engineer will see that he is promptly supplied with such specimens as he may require direct from the coal-field.

Proceedings of the Madras Government, Public Works Department,
24th September 1874.

2. His Excellency the Governor in Council thanks Mr. King for his useful review of the operations so far as they have gone, and desires it to be understood that when renewed they are to be conducted, as heretofore, under the general direction of Mr. King.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the District Engineer, Godavery.
,, Superintending Engineer, Kistna.
,, Public Department.
To W. King, Esq., Deputy Superintendent, Geological Survey.

Exd. S. T. Austin.
Spare Copies

No. 21

From.

William King Esq^r.
Deputy Superintendent Geological
Survey of India

To,

The Chief Secretary to Government
Madras

Dated 12^th August 1874

Sir,

I have the honor to forward the following report on the coal-boring explorations under my direction at Beddadanole in the Godavery District.

Up to this date I have not received, directly, any of the Proceedings of the Madras Government on the subject since the despatch of my preliminary letter to the Secretary to Government of Madras, Public Works Department dated 6^th of June 1874, No. 20.

On seeing copies of these Proceedings in the Daily Papers, I wrote to Colonel G. W. Walker asking for them and that a packet of specimens from the Beddadanole coal-field which had been

despatched to Madras should be sent up to me for examination.

Colonel Walker then supplied me with the required copies of these Proceedings, and on the 8th Inst. the box of samples reached me.

The result of the coal explorations so far, is that four (4) seams, of coal, or carbonaceous shale have been struck in the field; one of these in bore-hole № 2, and three in № 4. There is a little discrepancy between the lists of strata in the bore-holes given in Mr. Vanstavern's report, and the specimens now sent up; but practically this does not alter the case. There are four specimens marked as coal; while, in the bore-hole lists, they are given as "shale with coal" in № 2; "shale and coal"; "clay with mineral charcoal"; and "coal" in № 4.

The four specimens of coal are all dull and earthy; that from the 4½ feet seam being the best looking; the others are more or less associated with clay and shale. Nevertheless, the fact remains that there are

four seams with coal in them, thick and poor coal in one, and thin and poorer coal in the others. It is possible that each of these seams may be greatly better in quality and thickness in other parts of the field.

On a private application to Mr. Vanstavern, after I had heard that the specimens had been sent down to Madras, he sent me a sample of the lower two feet of the thick seam which is evidently the better part of the deposit. An assay of this sample, made in the Survey laboratory by my colleague Mr. Tween, gives the following result:-

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Volatile	30.6
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	100.0

As a coke

Carbon	22.5
Ash	77.5
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At first sight, the large percentage of volatile matter, indicates a fair gas coal but Mr. Tween tells me that there must be

from 12 to 14 per cent of moisture included in the volatile element. Thus, it is emphatically a poor coal.

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The remaining specimens forwarded are clays, a piece of the "sandstone with Pyrites", and the rock of the "last cut" in No 4 bore-hole which owing to its hardness, practically stopped Mr Vanstavern and led him to look on it as a metamorphic rock, that is that he had reached the floor of the field. Among the clays, there is a very dark grey variety which my friend Mr Hughes of the Geological Survey recognises as similar to some of the ~~fire~~ fire clays he has met with in the Raniganj coal-fields.

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I do not think it can be considered as a rock forming the floor of the coal-field.

As previously stated in my paper on this field the beds are all, on the average, dipping about 10° West-South-West except in the northern part of the field where they are N.W.; thus having a strike N.N.W.-S.S.E; and then N.E. and therefore had the bore-holes been put down in lines starting from the eastern side of the field and going westwards, we should gradually have got through the whole thickness of strata. The work

was not commenced till very late in the season, and thus I wished if possible to get at coal at once. With this intention and in the hope that the river itself might hide strata in which were seams of coal, I instructed Mr. Vanstavern to begin on the river near the village. The first bore-hole was a failure. No 2 bore-hole was then put down, and carbonaceous shale was got in it, but it had to be stopped owing to falling in of clays and want of piping. To get lower than we had done in No 2, it was necessary to look eastward, but no suitable place showed until in the nullah to the north of the village, and this would be in strata much below those examined in No 2. Still an idea could be got from No 3 of the lowest beds in this line, and as is shown in the list, they are all sandstones of good thickness with fewer and thinner clays than in the other bore-holes, but without the slightest trace of coal.

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On seeing that No 3 was not likely to produce any favorable result and that it was becoming a troublesome hole, I suggested that a convenient spot should be selected to the south of the village in the nullah on that side, as I thought we should here be in the continuation of the unexamined beds between No 2 & No 3; and it is in these that the three other seams have been found. In other words, I expect that these seams would be found at very nearly the additional depth below the 229 feet of No 2. This would of course be at an inconvenient depth for boring, more especially as the extent of the seams can be ascertained by other short holes.

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there are still some few feet to be got through before reaching beds corresponding to those at the surface of No 3.

Otherwise, another borehole should be put down about 400 yards back, ie. eastward and in the nullah south of the village.

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With regard to the coal in these measures, that now known to exist is on

on the eastern edge of the field and it is reasonable to expect that the seams go on thickening with the strata, or that there are more seams.

... There is about the same area of coal measures exposed on the western side of the main stream, but the strata there are all higher than those on the east side. No borings have been put down in these upper beds, but they are just as promising in their characters as those below. Indeed my colleagues who have worked in the other coal-fields of India have observed that seams are more prevalent in upper beds of the Barakars ... The lie of the strata on the right bank of the river is also somewhat easier, so that if coal be found on this side the probability is that the trial borings will not vary much in depth as they are carried out further west, or north-west.

It is, however, very premature as yet to try and reckon on what may be, from the few indications obtained so far, for where, as is evidently the case here, the

it is only an outlying patch of the coal measures, not an area left so much by denudation as merely the filling in of a detached basin by a formation which was existent only in an attenuated condition, the occurrence of coal to a greater or lesser extent in each patch is a question attended with a great deal of uncertainty. There may be only a few seams as at Kamaram, or many seams as at Singareny in the Nizam's Dominions; or seams hardly any of which are continuous in different bore-holes as in the British field below Dumagoodium.

The main and first thing to be done now is to continue No 4 bore-hole, or to sink a fresh one to the eastward of that as suggested above, and then to work down the nullah to the main stream. After that, the nullah on the other side of the field higher up the main stream and coming from Namiapollian ought to be tried. This latter examination would tell if the poor seam in No 2 hole is of any extent. It would certainly be premature to try any of the ground south of the

tributary nullah near bore-hole No 4, until more is known concerning the succession of the seams now struck.

In conclusion, it is necessary from my views of the relations of the strata in this field — to remark on two passages in the Government order No 1958 of the 21st July. It is therein stated:— "But the "very slight indication of shale and coal "found about 30 feet above the coal deposit "in No 4 may be analogous to that of No 2, "with which it agrees in the strata immediately over and underlying". My observations do not bear out this analogy: for, unless unforeseen accidents — of which there is no indication in the adjacent nullah sections — have interfered with the normal position of the strata; every thing seems to lead to the conclusion that the beds of No 4 are lower than those of No 2. Besides, if the upper seam in No 4 be analogous to that of No 2 it is difficult to account for the non-occurrence of the 4½ feet seam in No 2, which is the deeper bore-hole.

There is then, the further

statement that, "the conclusion arrived at to bore next season to the south and west seems a correct one".- On this point it will be seen from this letter that I do not advocate such a procedure; but to keep for the present rather to the north and northwest, as soon as the west side of the field is taken up. But, apart from this, I would respectfully submit that a conclusion as to the future sites of bore-holes ought more properly to be based on the recommendation of the Geologist as long as he is not absolved from the office of advising as to the possible locale of the coal- In this however, it is not for a moment implied that there is any likelihood of a difference of opinion between Mr. Vanstavern and myself as the mode of pursuing the work, on the contrary, I have to thank him for having always so willingly cooperated with me.-

I have the honor to be
Sir
Your most obed. Servant
William King
Deputy Supt. Geol. Survey of India

Geol. Survey Office
Calcutta

Rec'd 24 Sept/24
Ans 15 Oct 24.

Public 1874 DEPARTMENT.

From

Mr Deputy Superintendent
Geological Survey

No. 21

Dated 12. August 1874
Recd. 20. August 1874
No. 1192

S. C.

E. Forwards report on the coal-boring & exploration at Beddadenole. Godaveri Dist.

Transmitted to the Public Works Dept.
for information.
J. Clements Asst
Offg. Chief Secretary

To the Public Works Department
Octacamund 21st August 1874.

Recd 24/8/74.

P. W. 1874 Dept
Pro: Govt Letter
No: 5801

From

The Chief Secy
Pub: Dept.

Dd. 21 Augt
Rd 14 Septr } 1874.

E.I.

Transferring a letter from Mr King reporting on the coal bearing explorations at Beddadanole in the Godavery Dist.

Rb No: 2714. 24.9.74.

Ans 521

Pro: of the Madras Govt

Read the following:-

From the Dy: Supt. Geological Survey
To the Public Dept. } (H. E. Do 21 of 12th Aug 74)

2714

12

Care will be taken in future to supply Mr King with all papers relating to the Coal boring operations which are being carried on in the Godavery District. And the District Engineer will see that he is promptly supplied with such specimens as he may require direct from the

Coal

Coal field.

His Excellency the Governor in Council thanks Mr. King for his useful review of the operation so far as they have gone and desires it be understood that when renewed they are be conducted as heretofore under the general direction of Mr. King.

Govt

521-522.

6 8/

To Supt Godavery
Supt Engr Kistnah
Public deptt
Dr. King Engr
Dy Supt Geological Survey
C. Copies dispd 30/9/74

P.W.D.

Proc: of the Madras Govt.

Read the following:-

From the Dy: Supt Geological Survey thro' the Public Deptt } (A.E. No. 2187 12th Augt 74)

13

Inadvertence (perhaps owing to Mr. King's absence from the Presidency) it appears that that Gentleman was not supplied at once with copies of G.O. No. 1777 of 2nd July and No. 1953 of 21st July. Measures will be taken to insure prompt supply of such papers for his information

Instructions
Care will be taken in future to supply Mr King with all papers relating to the Coal bearing formation which are by Carriedon in the Godavery Dist. And the Govt Engr. will also be furnished with such drawings as he may require direct from the Coal fields for

Dos
//

information in future.
That he was not supplied
direct from the Godavery
District with specimens
from the Beddadanole
Coal borings is probably
owing to his having
failed to make arrange-
ments to that effect with
Mr. Vanstavern or the
Dy. Engineer. It was un-
derstood from his letter
recorded with G. O. No. 1777
of 2. July that he was
in communication with
Mr. Vanstavern, and
would

I think Mr. Foote should be
told by the P. W. D. Secretary Mr. King
for his prompt review of the
proceedings so far as they have
come and desires that he
understood that steps be
viewed by are to be conducted
as hereto for under the
general direction of
Dr. King.
2/9

would receive notes and
specimens from him
direct.

The result of the
assay of these, the first
undoubted specimens
of Coal discovered in the
Madras Presidency, is not
particularly encouraging.
But Mr. King appears
to think it possible that
the quality of the 4 seams
pierced, may improve
in other parts of the
field; the extent and
thickness of which he
seems to think greater
than

than he at first anti-
-cipated.

Mr. King's correc-
-tion of the surmise
made in para 2 of G.O.
No. 1943 of 21st July is of
course accepted; as well
as that of the conclu-
-sion arrived at by
Mr Vanstavern as to
the direction in which
further researches should
be made, which ap-
-peared to the Govt.
to have been in con for-
-mity with Mr King's
own

15

own ideas, as recorded
in para 10 of his report
~~printed~~ recorded with G.G. No. 502
of 14 May 1873. His Ex-
-cellency the Governor in
Council has not the slightest
intention of relieving
Mr. King from entire res-
-ponsibility for the super-
-vision of the experiment-
-al borings that have
been undertaken on his
advice; and the result
of which has already pro-
-ved the accuracy of
his forecast, founded on
scientific knowledge. Mr
King will be so good as

to

to continue to afford
Mr Vanstavern the
benefit of his instruc-
tions in the future con-
duct of the boring ope-
rations which should
be resumed as early as
practicable.

Copy

S.801

Enclosure

Mr R. H. Brown C.E.
Mr J. A. Smith
Mr F. H. Jones

Private

Ltr 11/9/54 Rtd 12/9/54

5801 V

Govt. of {1874} Madras.

PUBLIC WORKS.

To

The Dist. Engr.
Godavery

Dated

Recd. Encl.

G. O., Public, No. 2714

Nos. 521-522.

Coal

Passing orders on
Mr. King's report on the
Coal boring exploration
at Beddadanole
in the Godavery Dt.

Coal 1/9/74 Rlts 12/9/74