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Proceedings of the Madras Government, Public Department,

30th January 1871.

Read the following papers :—

No. 101. From A. HUNTER, Esq., M.D., Superintendent of the School of Industrial Arts, to the Chief Secretary to Government, Fort Saint George, dated Madras, 17th September 1870.

I have the honour to report the discovery of coal in two localities, one of these about five miles from Gooty on the road to Adony, and the other three miles from Gooty to the north; also the discovery of petroleum at Khondopalpaud in the same district.

2. I have visited the first of these localities, on Thursday the 16th instant, with Store Serjeant Fenner, who brought the coal to my notice, and have distributed to him and several of the Railway officials in the district samples of the coal from Chandah and of minerals from the coal formations in Scotland and England, which I collected, when at home on sick leave, eleven years ago.

3. I have frequently marched from Cuddapah to Bellary, and was under the impression, from the minerals that I collected, that coal was likely to occur in the district. I believe that the largest deposits will probably be found between Ryalchereroo and Tadputry, where there are extensive beds of sandstones, shales, blue clay, magnesian lime, and other indications of coal. I left samples and a letter for Mr. Kelsall, the Sub-Collector of Gooty, and showed the minerals to E. Gibson, Esq., the Head Assistant, who offered to make further search. I have also left samples with Mr. Christopher Hill, Assistant Traffic Manager, Cuddapah, and have communicated with Mr. Elwin on the subject, and offered rewards of Rupees 5 for the discovery of shells in the limestones, and the promise of more liberal rewards for coal.

4. I would respectfully suggest that Mr. C. Hill, the Railway Department at Cuddapah, would probably be the best person to be entrusted with the search for coal, as he has been employed, for several years, amongst the coal fields of Wales. Mr. Elwin approves of this suggestion. I will report, at greater length, on the subject next week, when I hope to have a considerable quantity of coal sent to me for analysis and report. I have also to bring to the notice of Government the discovery by Colonel Haig, R.E., of two beds of coal in the vicinity of Dummagoodium and twelve miles further up the Godavery, one bed was discovered last year, and the other, which Colonel Haig reports to be of better quality and superior to the coal of Chandah, is five feet in thickness. I expect a box of the latter to-day by the coasting steamer, and will report upon its quality. I tested the limestones and minerals which were found on the banks of the Godavery, and told Colonel Haig that they were almost identical with those of the English and Scotch coal measures, and that they were very likely to be of a good quality, which has proved to be the case.

No. 102. From the Director of Public Instruction, to the Chief Secretary to Government, Fort Saint George, dated Madras, 18th October 1870, No. 1749.

At the request of the Superintendent of the School of Arts, I have the honour to forward the accompanying letter, No. 757, of the 14th instant, for submission to His Excellency the Governor in Council.

From A. HUNTER, Esq., M.D., Superintendent of the School of Industrial Arts, to the Chief Secretary to Government, Fort Saint George, dated Madras, 14th October 1870, No. 757.

I have the honour to report, for the information of His Excellency the Governor in Council, that, for some time past, I have been receiving from parties in the North Arcot, Cuddapah, Gooty, and Bellary districts important minerals, marbles, limestones, fire-clays, metals, and indications of coal, which appeared to me of sufficient importance to be brought to the notice of Government.

2. Since the commencement of the railway operations, I have watched with great interest the progress of the works, and have visited almost every important cutting on the lines from Madras to Beypore, and from the Arconum Junction to Gooty. I have been in communication with the Railway Engineers who commenced the cuttings, and with those who have since carried them on, and have to return thanks more especially to Messrs. Wilson, McNair, Smart, and Anderson, for having sent to the School of Arts samples of the minerals dug out of the cuttings.

3. As a considerable mass of information has thus been collected, it will be as well that this should be epitomised and arranged for use, as I have already ascertained that many of the minerals are of economic value, and a few of them are coming into extensive use for building and ornamental architecture. More of them will probably be employed for the same purposes when their uses become better known.

4. One point which is deserving of special notice, and which greatly assists inquiries of this kind, is the stone walls along the sides of the railway. These have, for the most part, been built of the loose stones, shales, slates, or minerals which have been found in the railway cuttings, and the tops of the walls have been finished with a layer of mortar, in which large blocks of the stones have been set up on their edges, thus showing the surfaces, the cross fracture, and the thickness of the strata employed. From careful examinations of many of these walls, as well as the cuttings from which they have been excavated, I am able to lay before Government a pretty accurate statement of the superficial mineralogy of the country through which the various lines of railway pass. This information has also led to geological information of considerable importance bearing upon the resources of the different hill ranges through which the lines of railway pass.

5. Commencing at Madras, the first mineral of importance discovered was gypsum, or sulphate of lime, found at first in small crystals, sticking out of the embankments near the Gun Carriage Manufactory. The origin of these crystals was traced to recent lacustrine shells of the genera turritella, helix, unio, paludina, and ampullaria, embedded in a red, yellow, or black marl, smelling strongly of sulphuretted hydrogen, and giving indications when tested of iron, sulphates, and chlorides, the two latter derived from salt water from the yearly inundation of the canal. In the black clay of this locality stems of trees have been found imperfectly converted into lignite and impregnated with silica and sulphuret of iron, the bed of gypsum has since been traced to Ennore and Cuttawakum, it is of no great extent or breadth, but the same ground has yielded annually crops of crystals, for the last fourteen or fifteen years, amounting to fifteen or twenty tons each year. As the demand for gypsum in Madras for making plaster-of-paris has been steadily increasing, this bed has not been found sufficient to meet the requirements of the public. The mineral has since been traced to eighteen different localities, chiefly upward down the backwaters on the coast, and to more extensive beds at Tiagar and Trivacrey in South Arcot, and Ootatoor near Trichinopoly.

6. At Avady, a considerable cutting was made from the 11th to the 13th mile, to a depth of about eighteen feet. Of this from six to eight ft. were through a bed of tough yellowish plastic clay, suited for the manufacture of firebricks and common descriptions of coloured pottery. This bed of clay appears to extend continuously for thirty or forty miles through the Chingleput district, varying slightly in chemical quality; at the Red Hills the clay is very soapy and contains magnesia; at Streepernatoor it rests on a bed of white aluminous shale with sandstone, white fossil wood, and the bones of animals apparently recently fossilised. The molar teeth of elephants have been picked up between the Red Hills and Streepernatoor completely silicified, some impregnated with iron and of a red colour, and others with silica and of a pure white. Amongst the clays of this district impressions have been found of plants, resembling zamias and cycads, with a few recent shells imperfectly silicified. In the cutting at Avady a large mass of hard detached laterite was found imbedded in the

plastic clay and evidently deposited along with the clay, and showing the effects of transportation by running water. The mass of laterite was eighteen feet long by eight or ten feet in height, and about the same in thickness. In the same vicinity were found a number of earthenware vessels, some of a large size, and burnt clay figures of men on horses, all leaning over in the same direction and surrounded by a mixture of sand, clay, and gravel; probably the bursting of some large tank, or the inundation of the river which supplies the Red Hills' tank, had caused these deposits of clay and gravel, and transported this huge mass of laterite.

7. From Avady to Arconum Junction, forty-three miles from Madras, the country is flat, sandy alluvium, varying in fertility and producing but indifferent crops. From forty-eight to fifty-two miles near Tirutany low rounded hills of a pale grey syenite occur. These are fine-grained granite containing distinct crystals of quartz, felspar, and hornblende. They appear to have been upheaved at a period subsequent to that of the boldly-peaked higher ranges of granite behind them, near Sholinghur and Amoor. This syenite is easily quarried and has a tendency to split and exfoliate like gneiss, when heated and suddenly chilled. It is coming into extensive use for building purposes, and has been used for several of the railway bridges and public buildings now under construction in Madras.

8. At Naggery, sixty miles, and as far as Pootoor, sixty-nine miles, there is a considerable change in the rocks along the line; quartzite, hornstone, flinty slate, trap and basalt occur, and the distant hills assume a bold, vertical, and almost columnar appearance. The ranges about Naggery appear to have been tilted up in various directions. The strata assume a more parallel direction, and are upheaved at an angle of about thirty-two with a dip to the north-east. At Naggery, Pootoor, and Poody, seventy-eight miles, sandstones, slates, and shales occur resting upon conglomerates, jaspery clay ironstone, and greenstone. I have marched through this district during the early part of my service, and have frequently visited it since in search of minerals and fossils. I was very much struck with the resemblance which the hills bear, in these three localities, to the form of Salisbury Crags near Edinburgh, and the minerals and rocks are almost identical. At Naggery the rocks assume a basaltic or columnar aspect intersected by dykes of trap, greenstone (the whiststone of Scotland), with fragments of flinty slate, chlorite slate, and schist, jaspery clay ironstone, quartzite, and sandstone. In one locality there is a group of seven or eight rocks, which, when seen from Pootoor, look like gigantic tent pegs driven into the ground. They consist of gneiss. I should be inclined to refer the formations of Naggery hill to the old red sandstone period, though no fossils have as yet been found in this vicinity, as far as I am aware.

9. In the vicinity of Poody, seventy-seven miles, and from thence to Tirupetty, eighty-three miles, the strata assume a parallel direction, and enormous deposits of sandstone, slate, and shale occur, with a dip of about 27° to the north-east. On the west side of the line, or in the direction of Chittoor, the distant hills become lower and more undulating in their outline, backed by bold granite peaks. To the east of the line, or looking in the direction of Naggery, the scenery is very grand, bold, and picturesque. Vertical bluff cliffs of an imperfect sandstone with columnar gneiss intersected with trap, and basalt dykes rise boldly to a height of 700 or 800 feet. In the distance the country slopes gradually away into the level plains of the Nellore district. From Tirupetty to Baulapilly, ninety-seven miles, occurs an almost uninterrupted succession of sandstones, slates, quartzite, and hornstone, tilted up on their edges at an angle of about 92°. I have carefully examined the slates and shales of the Baulapilly cutting for about three miles, in the hope of finding some fossils or some indications in the vicinity that would assist in determining their age; but beyond a few rounded balls of silicious matter coloured by iron and dendritic manganese ramifying here and there through the cracks of the slate, nothing fossiliferous was found. Rewards were offered to the coolies employed on these cuttings if they could find any trilobites which were shown to them, but none have as yet been discovered. Some of the slates about the 93rd and 94th miles bear a strong resemblance to those of the quarries at Balahulish in Argyleshire, and to those near Luss on Loch Lomond; but, on trying the slates in considerable quantity, it was found that they would not split into pieces of any size, the lines of stratification being crossed by the planes of lamination in oblique directions leaving diamond-shaped pieces of only two or three inches in length. The slates have not the

strength of those found in Wales ; if the beds were quarried, however, to some depth the slate would probably be found to improve in quality.

10. After passing Kircumbady and between this and Codoor, 109 miles, there is a complete change in the character of the scenery, the bold granite peaks and columnar and basaltic rocks with scarped precipices disappear, and the hills present a more stratified appearance with a dip in the strata to the north-east. Transition rocks entirely replace the syenite, gneiss, and trap. Quartzite, hornstone, and rolled pieces of jasper, clay ironstone, soft slates, shales, and fire-clays abound. In some places band iron and claystone appear. At the 119th mile a thick bed of soft yellow sandstone occurs. In this vicinity there are distinct indications of important changes of the whole of the geological and mineralogical features of the country. Sandstones first of a flinty nature with jasper, chert, fossilwood, and clay ironstones abound with rolled pieces of quartz. From Codoor 120 to Redypully 122 miles, shales, fire-clays, and lithomarge occur ; at 130 miles purple soft slates alternate with pure white fire-clay.

11. From Nundaloor, 136 miles to 139 miles, extensive beds of very fine white fire-clay occur, resting upon beds of pale conglomerate, very like the true millstone grit of the new red sandstone series. The country slopes away to the east and north-east in the direction of Callastry, Vencata-gerry, and Nellore. The fire-clays of this district are about the best and most extensive in Southern India ; they rest upon sandstone, and it is in this vicinity that the search for coal ought to be commenced ; these strata continue as far as the 153rd mile. The Acting Collector of the North Arcot district has been furnished with specimens of the strata, metals, and minerals of the coal formations of Scotland, and with engraved illustrations of a few of the most important fossils. Small rewards have been offered for the discovery of shells and fossils, and if a good bed of workable coal is discovered, it will probably prove of immense benefit to Southern India.

12. At 141 miles the slates again become hard, and dull greenish grey ; at 142, they strongly resemble the true silurian and fossiliferous slates of Wales, and the same strata continue as far as 144 miles, where the colour changes suddenly to a yellowish grey, with dark green and red blotches ; at Woottimettah, 147 miles, there seems to have been a great disturbance of the strata and softer sandstones of pale red, yellow, and white colours appear ; at 149 miles the strata bear a very strong resemblance to those of the new red sandstone formations of the Lothians and Lanarkshire in the centre of Scotland. They are also accompanied by the same minerals and metals.

13. At the anicut at Ananapully on the Pennar river, magnesian limestones occur and ores of lead, copper, and iron crop out ; eleven miles north-east of Codoor there are some fine beds of green, black, grey, and whitish compact limestones ; these take a good polish and could be used for ornamental building purposes. At Jungumraz Pillay, eight miles from Cuddapah, the lead ores are rich in silver, and have been worked for many years by the natives.

14. From Cuddapah to Cumalapoor, 176 miles, the hills are low, flat, and the intervening country level ; soft sandstones, shales, and fire-clays with iron ores crop out here and there ; from this station by Tadputry to Ryalcheroo, 243 miles in a north direction, is an extensive flat level plain bounded by low sandstone hills. In this locality I believe that, if proper search be made, coal will be found, the strata are sandstones, slaty shales, magnesian limestones, conglomerates, yellow, grey, and black limestones ; in the grey limestones shells of the germs terebratula occur. These were first found by Dr. Benza, afterwards by the late Dr. Cole near Ryalcheroo, and again in 1865 in the same place. The shells appear to belong to strata above coal probably colitic.

15. At Khondopalpaud, five miles north of Tadputry, some very interesting formations occur ; on the sides of a hill there is a petrifying spring with stalactitic and encrusting concretionary lime which takes most delicate impressions of plants, stems, roots, &c. ; below this petroleum issues from the side of the hill. This solidifies on exposure to the air, and bears some resemblance to soft bitumen or India rubber. It burns freely emitting a good deal of smoke and a bituminous smell. The rocks in the vicinity are black plumpudding stone (the dense conglomerate of the Fife coal fields), black lime, jaspery clay ironstone, grey shale and fossil wood, black band iron alternating with veins of quartz and calcareous spar. All these minerals occur in the vicinity of coal fields in Fifeshire, the Pentland, and Derbyshire. I collected some very fine specimens of these strata when travelling in England and Scotland in 1859, and, on comparing them with some

collected at Khondopalpaud by Mr. Smart, late Chief Engineer of the Madras Railway, I find they are almost identical. Similar strata have also been received but without fossil impressions or petroleum from the banks of the Kistna below Datchapilly and from Palnad in the Guntur district, from Herrioor in Mysore found by Captain Puckle accompanied by very interesting fossils and a very promising kind of blue limestone. Mr. Boswell brought the minerals of Palnad to notice, and there seem to be enormous deposits of red sandstones and limestones on the borders of the Guntur district, which appear to belong to similar old red sandstone formations of Scotland underlying coal, and which bear also a strong resemblance to the sandstones which commence about 243 miles from Madras and extend for eleven miles towards Gooty. In this vicinity the hills begin to assume the same bold picturesque appearance as about Pootoor and Naggery. Dykes of rap greenstone and hard quartzite rise in bluff vertical scarps, against the sky, and are backed by the old primitive granite-peaked hills about Gooty.

16. The most promising locality for an extensive bed of true coal appears to me to be from the 231st to the 240th mile, or from near Tadputry by Ryalcheroo in the direction of Khondopalpaud, looking to the north ; on the left the sandstone, limestone, and ironstone strata rest upon shales, fire-clays, and blue lime, with a gentle dip of about 22° to the east ; about fifteen miles to the right the same strata appear again with a corresponding dip to the west, the distant hills being composed of low flat sandstone ; this reminded me very forcibly of the appearance of the coal fields at Elie, in Fifeshire, where the coal is worked close to the sea, and of the coal fields of Lanarkshire and the Lothians, all of which I visited and sketched.

17. For some years past I have expected that coal would be found in this vicinity, and may mention that I have been collecting the information embodied in this report and the samples referred to. I have also distributed specimens of the strata from the coal fields of Scotland and England, with a few fossil shells and engraved impressions of the best marked fossil plants which accompany coal. These were distributed at every station between Cuddapah and Gooty to the Station Masters employed on the line, and to eight young men from the School of Arts whom I found employed as guards, firemen, drivers, and in the Telegraph and Forest Departments. Small rewards were offered for the discovery of fossils, and it was hinted that, if any person found a good seam of workable coal, their name would be brought to the notice of Government for a liberal reward.

18. On arrival at Gooty I was told by Store Serjeant Fenner that he had seen all the minerals which I had brought from Scotland within a few miles of Gooty, and that he could show me them on the hills, and along with them pieces of a thin seam of what he thought was poor coal. On testing this coal, it proved to be of a poor quality, not unlike some of the anthracites of Scotland. I drove to the hill where it was found, and saw a few pieces of a thin shaly coal lying about amongst strata of the coal formations, but we could not trace the outcrop. Mr. Kelsall, the Sub-Collector of the district, also corroborated the fact of the occurrence of this substance on the hills about Gooty, and he has promised to make further search.

19. I would beg respectfully to suggest to Government that it is advisable that further search be made for coal in the vicinity of Gooty and between Kondopalpaud, Ryalcheroo, and Tadputry, and I would recommend that the services of Mr. Adams, who has been employed for seven years in the coal fields of Chanda, be temporarily engaged to work with a party of Sappers to make borings in this vicinity. Mr. Christopher Hill, Assistant Traffic Manager of the Railway at Cuddapah, who is well-acquainted with the coal mines of Wales, might also be requested to give advice on the subject.

No. 103. From the Superintendent of Geological Survey of India, to the Chief Secretary to Government, Fort Saint George, dated Calcutta, 2nd January 1871, No. 1.

I hasten to forward to you, for the information of His Excellency the Governor of Madras in Council, copy of a brief report by R. Bruce Foote, Esq., on the alleged discovery of coal near to Gooty, in the Madras Presidency. This report only reached me this morning.

2. Although I felt perfectly satisfied that there was no ground whatever for the statement made by Dr. Hunter, and, on his authority, by many others, I desired Mr. Foote, when proceeding to his season's work, to visit the localities, and carefully ascertain whether there was, in his opinion, anything which could afford a basis for such hopes as had been raised. I was, of course, aware that Mr. Foote had not himself examined the area in question, and I purposely left him, as you will see, without the geological map, which had been prepared by others, so that there should be nothing to influence his opinion derived from the work of previous observers.

3. I regret that I am compelled entirely to agree with Mr. Foote in thinking that there is not the slightest ground to hope that coal exists, or will be found, in the rocks which cover the area under discussion. I would also add that the statement put forth, as regarding this supposed occurrence of coal, evince such an ignorance of even the very first elements of geological knowledge, that I would have scarcely credited their being made, had not several previous instances, in connexion with the same informants, proved to me how very easily one not acquainted with the conditions can be misled by sanguine hopes, rather than guided by facts.

4. I would also state that a full report, drawn up by Mr. King, on the entire area of these rocks, in a part of which this coal was asserted to occur, is now in the press. In fact the report is printed, but its publication is only delayed by the time which it unavoidably takes in this country to have the necessary maps, sections, &c., in illustration of the report, prepared. I confidently hope, however, that only a brief time longer will be required for this.

Results of an inquiry into an alleged discovery of Coal near Gooty, and of indications of Coal in Cuddapah District.

Dr. Hunter in his letter to the Madras Government, which I perused by desire of the Hon. R. S. Ellis, C.B., the Chief Secretary, stated that he was led to examine a certain piece of ground lying west of the Adoni road, and about five miles from Gooty, by hearing from a Serjeant Fenner, stationed at that place, that he had picked up fragments of coal at the above spot.

Dr. Hunter himself picked up one or two more fragments of coal lying loose on the surface, at the same place, and from this he inferred the existence of coal below the surface, and recommended that a further search should be carried out by means of "borings."

In order that no possible mistake should arise in identifying the spot in question, I requested Serjeant Fenner to become my guide to it; and accordingly I visited it under his guidance.

The place I was taken to proved to be situate among the metamorphic rocks which at that spot consist of an extremely hard, massive, and highly crystalline variety of granite-gneiss, forming a low rocky hill west of Yerragoody tank. This granite-gneiss, which weathers into great tors and rounded lumps, is of a pale-pinkish or greyish white colour (when freshly broken), speckled with small crystals of black-mica in considerable numbers. Both here and throughout the neighbourhood it is traversed by trap-dykes (generally of greenstone) and small quartz veins.

It was very evident, therefore, that the coal fragments collected here could not have been derived from the underlying rock, but must have come from elsewhere. But no younger rocks out of which they might have been washed, or weathered, occur anywhere in the immediate vicinity. The nearest place at which younger rocks occur is fully eight miles to the eastward, where beds of quartzite and limestone appear; these belong to the "Cuddapah series," which is no where known to contain coal, or any carbonaceous minerals.

That the fragments of coal found by Dr. Hunter and Serjeant Fenner could not have been washed out of the Cuddapah rocks is quite clear, as no drift of any kind occurs at the level, where these fragments in question were found, which cannot be less than from thirty to fifty feet above the

nearest valley, that of the little stream which forms the Yerragoody tank. Furthermore the fragments of coal in question are perfectly angular, with an unweathered surface never having been rolled by water.

No fragments of coal remained at the time of my visit to Yerragoody hill.

Serjeant Fenner pointed out, as "most favourable indications of coal" according to Dr. Hunter, what proved to be the rather decomposed surface of a small trap-dyke, exposed in a ballast-pit close to the road. A hummocky intrusion of coarse dioretic trap was, on the same authority, given as "iron ore."

In conclusion, I have no hesitation in believing that the fragments of coal found by Dr. Hunter and Serjeant Fenner had been brought to the spot, where found, by some human agency.

They were either brought from a coal depôt, belonging to Mr. E. W. Barnett, C.E., the Railway Contractor, the remains of which may still be seen at the spot where the Gooty-Adoni road crosses the railway, a distance of only three miles from the Yerragoody hill; or else, they may have dropped from the carts in which Mr. Barnett carted a quantity of coal up to Adoni, previous to the time of Dr. Hunter's visit. In the latter case, the carts would have to pass within a few yards of Dr. Hunter's supposed coal-field.

Among the remains of Mr. Barnett's coal depôt, at the crossing over the line to which my attention was directed by Mr. Barefoot, the very obliging Locomotive Foreman at Gooty station, I picked up various pieces of slaty north-of-England coal, identical in appearance with the specimens from Yerragoody hill, which Dr. Hunter exhibited to His Excellency Lord Napier, and the Members of Council, on the occasion on which I was desired to attend.

2. *Indications of Coal near Cuddapah.*—Dr. Hunter's informant, as to the existence of good indications of coal near Cuddapah, was, I believe, a Mr. Adams, a *soi-disant* "experienced coal miner from Chanda."

The spot indicated as showing such promising indications of coal lies about five miles north-north-west from Cuddapah, where the limestones (here belonging to the Kurnool series) have been largely quarried in deep pits, a little to the east of the village of Chinna Mazapully. These pits at the time of my visit were quite full of water, but the waste heaps, which I went over carefully, showed not the faintest indication of coal or coal shale.

In addition to the negative evidence afforded by the waste heaps, I ascertained from Mr. Higginson, the Irrigation Company's Engineer at Cuddapah, who has worked the self-same quarries largely, and for weeks together has been in the habit of constantly visiting them, that he has never seen the smallest trace of carbonaceous matter in any part of the rocks there exposed. As Mr. Higginson is not only an experienced Civil Engineer, but also a careful and thoughtful observer of facts, his evidence may be very safely accepted as conclusive of the non-existence of coal or coaly matter at this place.

Dr. Hunter did not, I believe, visit this place personally, but merely brought Mr. Adam's supposed discovery to the notice of the Madras Government.

3. *Fossil shells and petroleum near Ryalcheroo.*—In his letter to the Madras Government, above referred to, Dr. Hunter further stated that he believed coal occurred in the rocks lying between Ryalcheroo (in Bellary district, fifteen miles south-east of Gooty) and Cuddapah, and advanced three reasons especially for such belief; firstly, the presence of fossil shells (*terebratulæ*) in the limestone near Ryalcheroo; secondly, the presence of petroleum in limestones at Khona Oopalpad (six miles north-east of Ryalcheroo); and, thirdly, the black colour of some of the limestones between Tadputri (Tandapurtee) and Cuddapah.

Dr. Hunter produced before the Council two fossil shells (*terebratulæ* of a species somewhat resembling *T. hastata*) which he stated came from Ryalcheroo, where they had been found some years ago by Major Bissett (since deceased, I believe), and added that the late Mr. R. Cole, Inspector-General of the Indian Medical Department, Madras, had also collected similar fossils at the same place.

As Dr. Hunter could give me no information as to the exact locality near Ryalcheroo whence the fossils came, and I had not the maps of that neighbourhood prepared by my colleagues, a great deal more time was required to investigate this point, than would have been otherwise necessary.

30th January 1871.

I examined a very large number of beds of limestone, with intercalated slates, shales, quartzites, &c., &c., without finding the slightest trace of any organic form, some very doubtful water-tracks excepted. None of the limestones agree in colour or in texture with that which yielded Dr. Hunter's specimens, and I cannot help having the strongest doubts as to the correctness of Dr. Hunter's statement that the *terebratulæ* in question came from Ryalcheroo, or any other place in that neighbourhood, inasmuch as the statement in question rests only on the authority of his memory which in this instance has, I firmly believe, played him false.

When Dr. Hunter showed me these *terebratulæ*, some days before the meeting of Council, they were *unlabelled*, in a drawer containing many other fossils from Europe, equally unlabelled, and mixed up together regardless of geological age or natural order. And whatever Major Bissett's specimens may have been, I cannot but think that, from trusting too much to his memory and from keeping his collections in a state of utter disorder, Dr. Hunter has made a mistake, and unintentionally taken some of European specimens for Major Bissett's.

The presence of petroleum in the limestone at Khona Oopalpad might appear to offer some support to Dr. Hunter's expectations of finding coal, in the Cuddapah series, if proved, but unfortunately no petroleum can be found there. The only substance which, following his directions, could be found at Khona Oopalpad, either by Mr. Kelsall, the Acting Sub-Collector of Bellary, or by myself, was a dark-brown glistening, foetid, substance, which has dribbled out of numerous small caves in the face of the cliff overhanging the Khona Ramaswamy pagoda.

This substance, though somewhat resembling petroleum in colour, differs very markedly by refusing to burn. Before the blowpipe it volatilized, without any appearance of flame.

The small caves out of which this brown substance dribbles are tenanted by numerous bats and blue pigeons, whose excrements are, by percolation of water in wet weather, converted into aspecies of guano retaining a very unpleasant bat-like odour.

The limestone cliffs in which this bat-guano occurs do not belong to the Cuddapah rock series, but are formed of a recent travertin deposited on the scarp of the older rocks by streams from a more elevated plateau of limestone (the Kurnool series) which lies unconformably on them.

The small caves are mostly spaces left between numerous large stalactites in the travertin, others are of artificial origin. This travertin is still being formed, but probably in far less quantity than in former periods when the country was less arid. Numerous organisms, such as land-shells and leaves of trees of living species, have been encrusted by the travertin, and their impressions are beautifully clear.

This bat-guano, I find, had been pronounced by my colleagues, the late Charles A. Oldham and W. King, Junior, *not* to be petroleum. I was not aware of this till after my visit to Khona Oopalpad.

In reply to a letter, in which I drew his attention to the fact that the supposed petroleum refused to burn, Dr. Hunter informs me that the specimen he received from Mr. Smart, late Chief Engineer of the Madras Railway, burnt with a strong flame dropping and giving off much gas; but he does not know exactly from where Mr. Smart got it. I intend writing to Mr. Smart on the subject, as soon as I can ascertain his present address.

It thus appears that none of Dr. Hunter's statements have been substantiated, while the most important have proved to be entirely without foundation. These statements were no doubt made by Dr. Hunter in a sincere belief in the correctness of his deductions; but the latter were, unfortunately, based on a series of hasty, crude and in some cases utterly incorrect observations, evidencing such a want of practical knowledge of geology and several other sciences, that in future his geological discoveries should be received with extreme caution and suspicion.

(Signed) R. B. FOOTE, F.G.S.,
Geological Survey of India.

No. 104.

ORDER THEREON, 30th January 1871, No. 125.

To be recorded.

(True Extract.)

R. S. ELLIS,
Chief Secretary.

Exd. J. Wright.

School of Industrial Arts
Graduated 17th Sept 1890

The Honorable W. J. Ellis Esq.
Chief Secretary to Govt

I have the honor to report
the discovery of Coal in two
localities one of these about 5 miles
from Gooty on the road to Putney
and the other 5 miles from Gooty
to the North. Also the discovery
of Petroleum at Khond Aopul
found in the same District.

I have visited the first of these
localities on Thursday the 16th Inst
with Stop Sergt. Tassner, who

and only a single

Govt. of 1871; 30th Dec.

PUBLIC.

Dated January, 30th.

Recd.

Recd.

G. O., 30th January 1871, No. 125.

JANUARY.
Nos. 101-104.

Recording letter from the Superintendent
Geological Survey of India, forwarding a brief
report by Mr. Foote on the alleged discovery of
coal near Gooty.

brought the Coal to my notice, and
specimens distributed to him & several
of the Railway officials in the
District samples of the Coal from
Chandah & of Minerals from the
Coal formations in Scotland and
England, which I collected when
at home on sick leave 11 years ago.

I have frequently marched
from Cuddapah to Bellary ^{& was} under
the impression, from the Minerals
that I collected, that Coal was
likely to occur in the District.
I believe that the largest deposits
will probably be found between
Mysicheroo & Tadpatri, where there
are extensive beds of Sandstones,
shales, blue clay, Magnesian
lime & other indications of Coal.

Left samples & a letter for
~~Mr. H. C. H. H.~~ the sub collector of
Gooty & showed the Minerals¹³
to Mr. Gibson Esq. the Head Officer
who offered to make further search.
I have also left samples with Mr.
Christopher Hill Esq. Traffic
Manager, Cuddapah & have
communicated with Mr. Elwin
on the subject & offered rewards
of Rs. 5. for the discovery of Shells
in the Limestones & the promise
of more liberal rewards for Coal.
I would respectfully suggest that Mr. C. Hill
of the Railway Dept. at Cuddapah would
probably be the best person to be entrusted
with the search for Coal, as he has
been employed for several years
amongst the Coal fields of Mysore.
Mr. Elwin approves of this suggestion.

and only a single

I will report at greater length on the
subject next week when I hope to have
a considerable quantity of coal sent to me
for analysis & report. I have also ~~to~~
bring to the notice of Govt the discovery
by Col. Haig of two beds of coal in the
vicinity of ^{R.S.} ~~Demamagodim~~ 4 to 12 miles
further up the Godavary, one bed was
discovered last year & the other which
Col. Haig reports to be of better quality
& superior to the coal of Chandel, is
to fast in thickness. I expect a box of
the latter today by the coasting steamer
& will report upon its quality. I tested the
limestones & Minerals which were found
on the banks of the Godavary & told Col. Haig
that they were almost identical with
those of the English & Scotch coal measures
& that they were very likely to be found
overlying Coal, which has proved to be
the case.

I have the honor to be
Sir
Your Most Obedt. Servt.
Wm. Hunter

Govt
11th Nov^r 70

My dear Mr. Ellis,
Yesterday I went
over the place where Dr.
Hunter discovered his
"Coalfield", having for
my guide Sergeant Fume.
It proved to be the very
piece of ground up the
Adoni road which I
spoke so positively about
little staggered by the Dr's
assertion that he had

Small report at greater length
about west coast surface.

found plenty of limestone
there & which led me to
believe he must be speaking
of some other spot far to
the eastward. - I followed
old Jenner all over the
low hills just west of the
Gerragoody tank but saw
nothing I had not seen
when I went over the same
ground very closely just a
year ago. - Coal was not
to be seen any where on
the surface, while the whole
country throughout consists
of massive granite - gneiss
in which no coal could

they

have remained undisturbed.
One place which Jenner
pointed out as a "favorable
indication" according to the
map, turned out to be a
somewhat decayed trap
dyke! -

No trace of any younger
rocks exists anywhere near
from which the coal might
possibly have been derived,
but numerous fragments of
identical kinds of coal remain
by the roadside just where
it crosses the line of railway
3 miles nearer to Rody. - Here
there had been a deposit of

Small report at greater length

Coal used by the Contractors
Engines. - Hunter's specimens
came thence, or they are ~~really~~
Dr. Hunter owes an apology
to the Government, the
public & the Geological
Survey in this individual case
for raising hopes without the
least foundation on the one
hand, & indirectly imputing
carelessness & oversight on
the other. -

On Monday I hope to get
to Muzpand & settle the
question about the fossils
which Hunter says left
from there. I should

MR.

2.

be glad if you
kindly procure
statement from Mr. Aden
the Banda Coal miner
of the exact spot where he
found, or suspected, coal
in the Buddapah country
That is all I want to know
of him. -

I hope to communicate
my further results to you
in the course of next week.

If the Madras Govt.
should wish to have any
of the other places named
by Dr. Hunter as having

yielded to it. I think
it would give me great
pleasure to do so, but in
that case it would be
necessary for me to be
detached for a while from
my regular work which will
take me into the country
between Annapolis & Suburban.

Such a roving Commission
would not occupy many
months & would be a duty
I should much like to
undertake.

Mr. King will be out
early next month & is

to take up the country
between Suffern & the
Hudson valley.

Believe me

Very dear Mr. Ellis

Very truly yours

R. Allen Root

Just before leaving the
Council Chamber Lord Napier
desired me to write to him
privately as to the results of
my trip up here, which I
have accordingly done today.

Goodby
18th Dec^r 70

My dear Mr. Ellis,

You will not be
surprised to hear that I
could not find any signs
of coal, or even coal shale,
near Cuddapah, at the
place where Mr. Latta was
said to have been found
the former indicated.

The quarry in which the
discovery is said to have been
made, is full of water, 10-
12 feet deep so I had to

Good

to be over

content myself with looking
over the wasteheaps, but I also
heard from Mr. Higginson, the
Irrigation Company's Engineer
at Coldwater, who has been
working these very quarries for
some time past, & visiting them
every day, that he never met
with the faintest indication
of coal matter. - I have no
hesitation in regarding Mr.
Higginson's statement as conclusive
evidence in this matter as
he is a man of strong common
sense, a good observer of facts
& has some geological knowledge.

I don't know whether you
heard Dr. Hunter telling the

commander in Chief at the
council chamber that the
Tadpatrie Pagoda, a photograph
of which the C. in C. was looking
at, at the time, was ornamented
with carvings in black limestone
such as he had a piece of in
one of his trays. - Happening to
overhear this I ventured to
remark that the carvings were
in greenstone, but Hunter contra-
dicted me point blank and
emphatically repeated his statement
as to the limestone. - Since
then, when camped at Tadpatrie,
I went twice very carefully
round the Pagoda, inside &
outside & found only a single

content myself with
over the waste heaps in

piece of black limestone in the
whole structure & that piece
is a more widely trimmed slab
forming the centre of the floor of
the mountain. The carved &
polished stones are all greenstone
carried close by, with the exception
of the great monoliths forming
the side-pieces of the gateway &
some other large masses used in
line of beams to form the lintels
of the gateways. These are of
granite brought from distances of
fully 50 miles. - A few pieces
of quartzite & sandstone have also
been used here & there but are
not carved. - A lingam &
some small pillars of granite
also there, but not a single

2.

bit of limestone beyond
the one solitary un-carved
slab above mentioned. -

Outside the N. gopuram
are two Nagas (snakes) carved
in a pale grey limestone &
stuck in the ground, tail
downwards; these can hardly
be reckoned as belonging to the
Nagas but are moreover very
poorly executed. On two rude
limbs of stone.

Finally in installing the carved
greenstone for limestone shows
him to be either a grossly
careless observer, or an
ignorant ignoramus, which

may be the case. I could
never again accept any statement
of his & should advise every
one else not to trust any
of his assertions in matters
geological or mineralogical.

When at Cuddapah, Captain
Clay of the Revenue Survey showed
me a letter from Hunter
about the rocks & stones of
the district, which I can only
describe as a tissue of object
misconception.

For the matter of fossil shells
which I have been looking for
most carefully near Nyalcherry
and Ladprattin, I failed not

only in finding fossils, but
also in finding any well similar
to that Hunter's specimens must
have occurred in. I am still
strongly under the impression
that the specimens he showed
to the Council came from Europe,
and that is also Dr. Hutton's
opinion.

Every point I was directed to
look into in this region having
now been settled I shall proceed
to Angkor & on to my regular
working ground.

If there should be anything
about which you might like to
write, write. Dr. Percival can
always give you my address,

which I shall be changing very frequently this season as my work will be running a boundary line...

Dr. Oldham has not replied to my proposals to furnish you directly with a copy of my official report on these coal questions...

Kind regards to the in Messrs by the 17th & will be ready, I am sure, to eat powder...

Excuse the disconnected character of my letter, as I am not well & feel very stupid...

Believe me

Very dear Mr. Ellis

very truly yours

N. Bruce Doble

Conrad

Public DEPARTMENT.

No. 1831.

From

The Director of Public Instruction

Dated 18th October

1870.

FOR ORDERS.

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31

I think Dr. Hunter has made out a sufficiently strong case to justify a careful search for suitable coal in the localities indicated by him & I would add to his suggestion of buying the Adams for the benefit

L. D. S.

I think so. I would have the engines

which shall be changing very

attention must be given
to the question of the
success of the school
Sicut.

1. I regret that I cannot mention the
proposed... to the...
2. I am sure the...
3. I am sure the...
4. I am sure the...
5. I am sure the...
6. I am sure the...
7. I am sure the...
8. I am sure the...
9. I am sure the...
10. I am sure the...

4/1

4/1



No. 1749

OFFICE OF THE DIRECTOR OF
PUBLIC INSTRUCTION,
MADRAS, 18th Oct. 1870.

From
THE DIRECTOR OF PUBLIC INSTRUCTION,
Madras,
To
THE CHIEF SECRETARY TO GOVERNMENT,
Fort Saint George.

33

Sir,

At the request of the
Superintendent of the School of
Arts, I have the honor to forward
the accompanying letter, No. 757
of the 14th instant, for submission
to His Excellency the Governor
in Council.

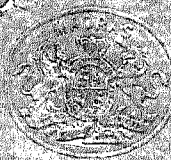
I have the honor to be,
Sir,
Your most obed^t Serv^t,
J. B. P. S.
Director of Public Instruction

which shall be changing very

controversial, one by the higher
scientific authority the other
by a practical man who has
had experience in the facts
of the district.

I regret that I cannot answer this
proposal. I think that before
committing the expenditure of
public money in a book for cost
under the direction of the Director
we ought to submit his report or at
least of it which relates to cost &
we have for a time other matters
of the Geological Dept. for remarks.

A. N.



No. 1749

OFFICE OF THE DIRECTOR OF
PUBLIC INSTRUCTION,
MADRAS, 18th Oct. 1870.

From

THE DIRECTOR OF PUBLIC INSTRUCTION,
Madras.

To

THE CHIEF SECRETARY TO GOVERNMENT,

Fort Saint George.

SIR,

At the request of the
Superintendent of the School of
Arts, I have the honor to forward
the accompanying letter, No. 757
of the 14th instant, for submission
to His Excellency the Governor
in Council.

I have the honor to be,
Sir,

Your most obedt. Servt.

W. P. S. S. S.
Director of Public Instruction

Results of an inquiry into an alleged
his cover, Moul, near Gooty, and of indications
Moul, in Cuddapah district. 35

Dr. Hunter in his letter to the Madras Government, which I perused by desire of the Hon^{ble} R. S. Ellis C. W. the Chief Secretary, stated that he was led to examine a certain piece of ground lying West of the Adoni road and about five miles from Gooty, by hearing from a Sergeant Turner, stationed at that place, that he had picked up fragments of Iron at the above spot.

Dr. Hunter himself picked up one or two more fragments of Coal lying loose on the surface, at the same place, and from this he inferred the existence of Coal below the surface, and recommended that a further search should be carried out by means of "borings."

In order that no possible mistake
should arise in identifying the spot a question

11

[illegible]

I requested Sergeant Fenner to become my guide to it; and accordingly I visited it under his guidance.

The place I was taken to proved to be situated among the Metamorphic rocks which at that spot, consist of an extremely hard, massive, and highly crystalline variety of Granite-gneiss, forming a low rocky hill west of Jerragoody tank.

This Granite-gneiss, which weathers into pebbles, and rounded lumps, is of a pale-pinkish greyish white colour (when freshly broken), speckled with small crystals of black mica in considerable numbers. Both here and throughout the neighbourhood, it is traversed by trap-dykes (generally of greenstone), and small quartz veins.

It was very evident, therefore, that the Coal fragments collected here, could not have been derived from the underlying rock, but must have come from elsewhere. But the younger rocks out of which they might have been washed, or weathered, occur anywhere in

the immediate vicinity. The nearest place at which younger rocks occur is fully eight miles to the Eastward, where beds of Quartzite and limestone appear: these belong to the 'Cuddapah series', which is as well known to contain Coal, or any Carbonaceous minerals.

37

That the fragments of coal found by Dr. Hunter, and Sergeant Fenner could not have been washed out of the Cuddapah rocks is quite clear, as no drift of any kind occurs at the level, where these fragments in question were found, which cannot be less than from 30 to 50 feet above the nearest valley, that of the little stream which flows from the Jerragoody tank. Furthermore the fragments of coal in question are perfectly angular, with an unweathered surface never having been rolled by water.

No fragments of coal remain at the time of my visit to Jerragoody hill.

Sergeant Fenner pointed out as 'most favorable indications of Coal' according to Dr. Hunter, what proved to be

The ~~then~~ ^{then} decomposed surface of
a small trap-dyke, exposed in a ballast-
pit close to the road - A hummocky
intrusion of coarse deoritic trap was, on the
same outcrop, given as "Iron-ore."

In conclusion, I have no hesitation in
believing that the fragments of Coal found
by Dr. Hunter, at Sigeant's Turner had
been brought to the spot, where found, by some
human agency.

They were either brought from a coal
deposit, belonging to Mr. E. W. Barnett, C.E.
the railway contractor, the remains of which
may still be seen at the spot where the
Gooty-Adani road crosses the railway, a
distance of only three miles from the Gerra-
gooty hill; or else, they may have dropped
from the carts in which Mr. Bennett carried
a quantity of Coal up to Adani, previous
to the time of Dr. Hunter's visit. In the latter
case, the carts would have to pass within a
few yards of Dr. Hunter's supposed coal-field.

Among the remains of Mr. Barnett's
Coal deposit, at the crossing over the line

to which my attention was directed by
Mr. Bancroft, the very obliging locomotive
Foreman at Gooty station. I picked up
various pieces of slaty north of England
Coal, identical in appearance with the
specimens from Gerra-gooty hill, which Dr.
Hunter exhibited to the Excellency, Lord
Napier and the members of Council, on
the occasion on which I was desired to
attend.

2. Indications of Coal near Cuddalore

Dr. Hunter's informant, as to the existence
of good indications of Coal near Cuddalore
was, I believe, a Mr. Adams, a disident
"experienced Coal miner from Chanda."

The spot indicated as showing such
promising indications of Coal lies about
five miles north-north-west from Cuddalore,
where the limestone (here belonging to the
Kurnool series) have been largely quarried
in deep pits, a little to the east of the
village of Chinnamazapally - These pits at
the time of my visit, were quite full of

water, but the waste heaps, which I went over carefully, showed not the faintest indication of Coal, or Coal Shale.

In addition to the negative evidence afforded by the waste heaps, I ascertained from Mr. Higgins, the Irrigation Engineer at Fuddupah, who has worked the selfsame quarries largely, and for weeks together has been in the habit of constantly visiting them, that he has never seen the smallest trace of Carbonaceous matter in any part of the rocks there exposed.

As Mr. Higgins is not only an experienced Civil Engineer, but also a careful and thoughtful observer of facts, his evidence may be very safely accepted, as conclusive of the non-existence of Coal, or Coal matter at this place.

Dr. Hunter did not, I believe visit this place personally, but merely brought Mr. Adams' supposed discovery to the notice of the Madras Government.

3. Fossil shells, and petroleum near Ryalcherov.

In his letter to the Madras Government, Vol. above referred to, Dr. Hunter further stated that he believed Coal occurred in the rocks lying between Ryalcherov (in my Bellary district, fifteen miles south-east of Gooty) and Cuddapah. And advanced three reasons especially for such belief: first, the presence of fossil shells (*Trilobites*) in the limestones near Ryalcherov; secondly the presence of petroleum in limestones at Khona Sopulpan (six miles north-east of Ryalcherov), and thirdly, the black color of some of the limestones between Tadpatri (Tandaputtee) and Cuddapah.

Dr. Hunter produced before the Council, two fossil shells (*Trilobites*) of a species somewhat resembling *Trilobites hastata* which he stated came from Ryalcherov, when they had been found some years ago by Major Risett (since deceased, I believe) and added that the

late Mr. R. Cole, Inspector General of the
Indian Medical Dept. Madras, had also
collected similar fossils at the same
place.

As Dr. Hunter could give me no
information, as to the exact locality near
Ayalcherov where the fossils came, and
did not the maps of that neighbourhood
prepared by my colleagues, a great deal
more time was required to investigate the
points than would have been otherwise
necessary.

Examined a very large number
blocks of limestone, with intercalated shales
shales, quartzites &c. &c. without finding
the slightest trace of any organic form
save my doubtful worm-tracks excepted.
None of the limestones agree in color or in
texture with that which yielded Dr.
Hunter's specimens, and I cannot help
having the strongest doubts as to the cor-
rectness of Dr. Hunter's statement that
(2)

the *Lebratulae* in question came from Ayal-
cherov, or any other place in that neighbour-
hood. Inasmuch as the statement in question
rests only on the authority of his memory
which in this instance has, I firmly
believe, played him false.

When Dr. Hunter showed me these
Lebratulae, some days before the meeting
of the Council, they were unlabelled, in a
drawer containing many other fossils
from Europe, equally unlabelled, and mixed
up together regardless of Geological ages
or natural order. But whatever Major
Hissett's specimens may have been, I cannot
but think, that from trusting too much to
his memory, and from keeping his collection
in a state of utter disorder, Dr. Hunter
has made a mistake, and unintentionally
taken some of European specimens for
Major Hissett's.

The presence of petroleum in the limestone
at Khana Copalpad might appear to be
some support to Dr. Hunter's expectations
of

of finding Coal, in the Cuddapah series,
if proved, but unfortunately no petroleum
can be found there. The only substance
which, following his directions, could be
found at Khona Bopalpad, either by
Mr. Kelsall, the acting collector of
Bellary, or by myself, was, a dark-brown
shining, fetid, substance, which has
dribbled out of numerous small caves
in the face of the cliff overhanging the
Khona Ramaswamy Kapota.

This substance though somewhat
resembling Petroleum in color, differs
very markedly by refusing to burn. Before
the blow-pipe it volatilized, without any
appearance of flame.

The small caves, out of which, this brown
substance dribbles, are tenanted by
numerous bats and blue pigeons, whose
excrements are, by percolation of water
in wet weather, converted into a species
of guano, retaining a very unpleasant

bat-like odor.

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The limestone cliffs in which this
Bah-pians occurs do not belong to the
Cuddapah rock series, but are formed
of a recent Travertine deposited on the
scarp of the older rocks by streams from
a more elevated plateau of limestone (the
Kurnool series) which lies unconformably
on them.

The small caves are mostly span
left between numerous large stalactites in
the Travertine, others are of artificial origin.

This Travertine is still being formed, but probably
in far less quantity, than in former periods
when the country was less arid. Numerous
organisms such as land shells, al leaves,
of trees of living species have been succumbed
to the Travertine, and their impressions are
beautifully clear.

This 'Bah-pians' I find had been
known of my colleagues, the late Charles
D. Adams, and W. King, but not to be
Petroleum. I was not aware of this till after

visit to Khoma Popalpur.

In reply to a letter, in which I drew
his attention to the fact, that the supposed
Petroleum refused to burn, Dr. Hunter informs
me that the specimen he received from
Mr. Smith's late Chief Engineer of the Madras
Railway, burnt with a strong flame
dropping, and giving off much gas, - but
he does not know exactly from where Mr.
Smith got it. - I intend writing to Mr.
Smith on the subject, as soon as I can
ascertain his present address.

It then appears that some of Dr.
Hunter's statements have been substantiated,
while the most important have proved
to be entirely without foundation. These
statements were no doubt made by Dr. Hunter
in a sincere belief in the correctness of
his deductions; but the latter were, unfor-
tunately, based on a series of hasty, crude
and in some cases utterly incorrect observations;
evidencing

such a want of practical knowledge
of geology, and several other sciences,
that in future his 'Geological discov-
eries' should be received with extreme
caution and suspicion.

(Signed)

R. B. Foote. Esq.
Genl. Secy. Phila.

Phil. City

Wm. Adams

Sup. Genl. Secy. Phila.

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47

Raichon
Jan 12th 1871



50

49

My dear Ellis,
My "Chief" will
be that this report on
Hunt's supposed Coal
has been sent to the
Madsen for. Will
you kindly see that the
Dep't Rep't ~~is~~ ^{is} for (which
is this creature) is put
down for copies of the
printed correspondence
and order that they be

Butter I think with

unusually sudden.

It's shorter & is being

written in the same

method as last. I don't

regret the expense

made at this in the

last in the same

then & I am sure

"I consider it

very fine

perhaps it is

very fine

very fine

very fine

very fine

very fine

very fine

very fine

sent to me at Raiden.
At present, I should
like very much to see
copies of Hunter's paper
and of Foster's answer.

Yours truly
William B.

the whole of 1870.

No. 1. 187.

Mr

Thomas M. M. S. M.D.

Sup. of Geological Survey of India

The Secretary to Government of Madras
Datum Calcutta July 2. 1871.

Sir

Enclosed to forward to you, for the information of the Secretary, the Governor of Madras in a copy a brief report, by H. Bruce-Foote Esq. on the alleged discovery of Coal near to Gooty, in the Madras Presidency. This report was received here this morning.

Although I felt perfectly satisfied that there was no ground whatever for the statements made by Mr. Hunter, as to his authority, by many others, I decided Mr. Foote, when proceeding to his season's work, to visit the localities, and carefully ascertain whether there was in his opinion anything which could afford a basis for such hopes as had been raised. I was, of course, aware that Mr. Foote had not himself examined the area in question, and I purposely left him, as you will see, without the geological maps which had been prepared by others, so that there should be nothing to influence his opinion derived from the work of

Printed by Messrs. ...
Calcutta 10/10/71

Mr
July 1871
- enclosed -
forwarded to
the Secretary
Madras

21/7/71

of previous observation.

3. Regret that I am compelled entirely to agree with Mr. Dole in thinking that there is not the slightest ground to hope that Coal exists, or will be found, in the rocks which cover the area under discussion. I would also add that the statements put forth, as regarding this supposed occurrence of coal since such an ignorance of even the very first elements of Geological knowledge, that I could have scarcely credited their being made, had not several previous instances, in connection with the same informant proved how very easily one not acquainted with the conditions can be misled by sanguine hopes, rather than guided by facts.

4. I would also state, that a full report, drawn up by Mr. King on the entire area of these rocks, is a part of which this Coal was asserted to occur, is now in the press. In fact

506 12
the report is printed. at its publication is only delayed by the time which is unavoidably taken in this country to have the necessary maps, sections, &c. in illustration of the report prepared. I confidently hope, however, that not a brief time longer will be required for this -

I remain the humble
Sir

Yr. obed^t Servant

Wm. A. Allen

Geog. Office.
Calcutta
July 2. 1871

Sup. Genl. Surg. of India

