

(1) Number of pages 34
(2) Date of repair 27-1-57
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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Revenue DEPARTMENT

G.O. No.	474	Press.
B.P. No.		Mis.
Dated	24-4-1957	197 .

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174

GOVERNMENT OF MADRAS.
REVENUE DEPARTMENT.

24th April 1880, No. 474.

No. 238. READ THE FOLLOWING PAPER:—

From R. BROUGH SMYTH, Esq., Mining Engineer, to J. H. GARSTIN, Esq., C.S.I., Acting Secretary to Government, Revenue Department, dated Mangalore, 2nd March 1880.

I have the honor to submit the following report for the consideration of His Grace the Governor in Council.

2. I left Mangalore at 6 p.m. on the 8th February and arrived at Karkal on the 9th at 4° 30' a.m.

3. On the 10th, I was engaged in examining the country and in making enquiries respecting the occurrence of gold in this area; and the Sub-Magistrate, and all others who were questioned, stated that they knew of no gold workings, and that they never heard of gold having been found near Karkal. White stone (quartz) was, however, I was told to be seen at Tallar and Miar.

4. *Tallar*.—This spot is about two miles north-eastward of the bazaar. The bed-rock is gneiss and granitoid gneiss; the foliation obscure, but where observable about N. 50° W.—S. 50° E. The soils are poor and of variable thickness, the colors being pale chocolate and light yellowish and reddish brown. Numerous fragments of country-rock, and small angular pieces of quartz are scattered on the surface, and found also rather abundantly in the soil wherever it is dug up. In the valleys the soils and the bed-rock (the latter to some depth more or less decomposed) are nearly of the same color. At one spot on a low ridge there are larger fragments of quartz, and they cover a considerable space, all derived from what may be a vein, the situation of which is indicated by outcropping blocks. It was not possible to ascertain the direction of the vein or band without making an excavation; and as no gold was found in the soil, after repeated trials, I did not think it desirable to undertake any works in this locality. Northward of this ridge, on the edge of the valley, where a deep ditch has been cut, the bed-rock is well exposed. Throughout a thickness of fifteen feet it is intersected by veins of quartz from one to twelve inches in width; and wherever a cutting is made similar veins, usually less numerous, are found. One small vein or "leader" was seen to strike N. and S. and to dip W. at a very low angle. The soils near these veins were washed and not a particle of gold was seen. All that remained after washing was a small quantity of yellow sand with minute specks of sesqui-oxyd of iron. Specimens of the quartz were collected for subsequent treatment by amalgamation. The quartz is everywhere of the same character; it is milk-white with translucent patches, and in places crystalline; it is not mineralised; no pyrites were seen in any place; and it bears no resemblance to the auriferous quartz usually found in Southern India. Some of the quartz was broken on the spot and in none was gold visible under the lens.

5. *Miar*.—About one mile eastward of Karkal there is an outcrop of quartz extending for a length of one hundred and fifty yards. The direction of the vein is N. 30° W.—S. 30° E. The thickness probably does not exceed five feet in any part. Several dishes of earth were washed here and not a trace of gold was discovered, nor was any gold seen in the quartz. Pyrites and other minerals generally found with gold were absent.

6. *Mooroor*.—Near Kookundoor, about 2½ miles from Karkal, is a hill named Mooroor. The hill is a bare blackened dome-shaped mass of gneiss with a thin covering of the so-called laterite (detrital) at its base. Intersecting this rock are (rarely) thin veins of crystalline quartz, and one, from half an inch to four inches in thickness, running in a straight line, has a direction N. 72° W.—S. 72° E. There are rather large crystals of felspar impacted in the rock, giving it in places

a porphyritic character, but it is strictly a granitoid gneiss, many hand specimens being exactly similar to an ordinary ternary granite. And the thin veins of quartz are like those usually seen in granite. About two hundred yards south of the base of the hill is a rather large exposure of micacised crystalline quartz; its direction being, as nearly as could be ascertained N. 7° E.—S. 7° W. The thickness and dip could not be measured. It is seen only where a cutting has been made, but the low rise near it is strewn with fragments of quartz.

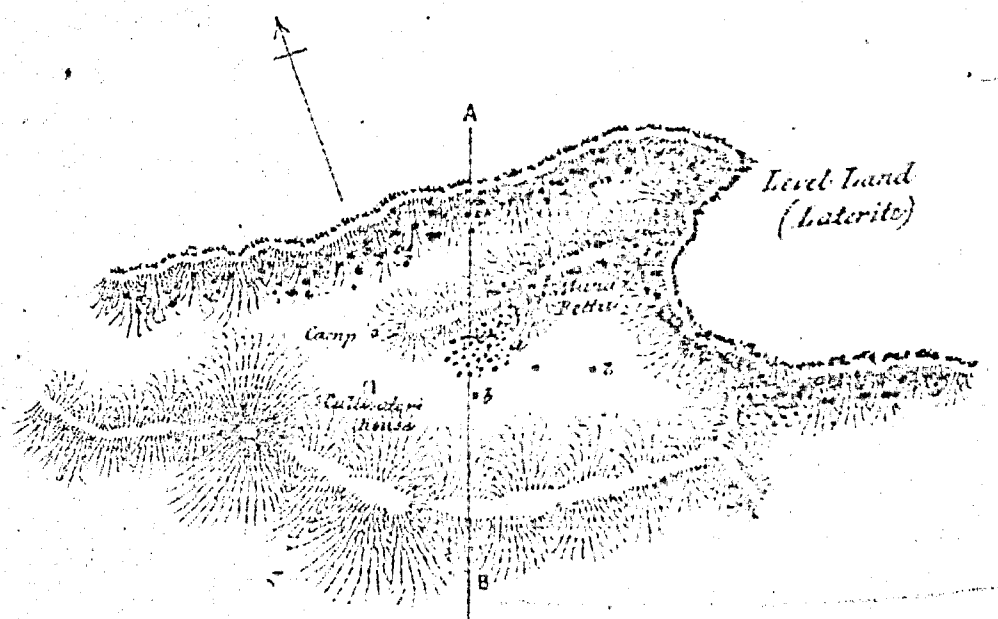
7. These areas have none of the characteristics of auriferous tracts; and no native workings were seen in any place.

8. On the 15th February I left Karkal on my way to Mijar, and I was compelled to remain at Mudbidiri until the 17th, as a shelter of sticks, boughs and leaves had to be erected at the old "diggings" near Mijar for the accommodation of myself and Mr. Thomas Laing, and to afford protection also to the stores, tools, instruments and furniture which I had to carry with me. The native officer at Mudbidiri, I am sure, did his utmost to get the place prepared as soon as possible; and from its appearance it was probably the work of a few hours. It afforded some slight protection from the sun during certain hours of the day.

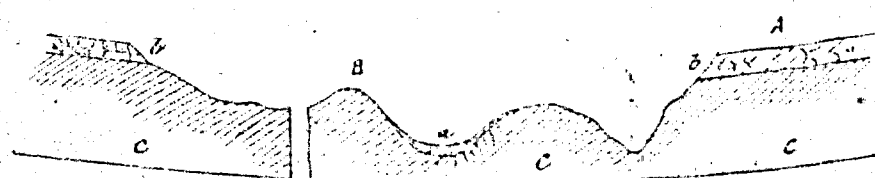
9. I arrived at the diggings on the 17th at 3° 45' P.M., and at once commenced an examination of them. The hill—Munda-bettu—is distant about two miles from the village of Mijar, and its summit is only sixty feet above the valley or "flat" on its south-western side. The bed-rock, before it was disturbed, was covered with soil and gravel to a depth of a few inches on the summit, gradually thickening towards the base; at the foot of the hill in the valley the thickness of the soil, gravel, clay, &c., is twelve feet.

10. Subsequently during my stay at the old diggings the hill and the neighbouring ranges were diligently prospected.

11. The form and position of Munda-bettu will be best understood from a sketch-plan and section—



a. Diggings and Quartz vein or band.
b. Shafts.



a. Gravelly loam and clay (auriferous).
b. Laterite.
c. Gneissoid rock with narrow quartz veins or bands.

12. The auriferous soil and detritus on Munda-bettu are composed of loam and clay with small water-worn pieces of country-rock, fragments of laterite mostly in the form of hematite and limonite, and small angular pieces of white and ferruginous quartz. These have been derived partly from the disintegration of the bed-rock and partly from the laterite.

13. The area actually worked by the natives is not more than one acre and-a-half, and much of it seems to have been turned over several times. At one spot the bed-rock is laid bare over a space of several square yards, and it was here, it is said, that gold was got in considerable quantities. The surface of the bed-rock is irregular—grooved, so to speak, downwards from the summit—and there are consequently variations in the depth of the soil. Water was conserved in shallow excavations, and used either for sluicing or for washing the earth in the wooden dish. There are heaps of "tailings" lying on the surface.

14. The natives at Mijar say that no profitable work has been done during the past two or three years; that few of them ever mined on the hill; and that nearly all the work was done by men who came down from the ghâts. Near what is supposed to have been the richest "patch" some earth was taken by Mr. Thomas Laing and washed and one rather coarse speck of gold was found together with some finer particles.

15. The hill was prospected by cutting sections across it at different levels, and by making excavations on and near its summit and by sinking pits down to the bed-rock on and near the "flat."

16. Earth was taken from all these places and washed. Nineteen dishes of soil from various parts of the hill showed a few minute particles of gold; of five dishes from the summit one only gave a speck; and one dish from a new cutting near the summit showed no gold.

17. A pit was sunk on the "flat" where I was certain I should find undisturbed ground and thus get a correct section, and it showed the following layers from the surface downwards:—

	Ft. In.
1. Loamy soil	0 6
2. Sandy clay and gravel and a few small pieces of carbonised wood	7 6
3. Harsh, dry, mealy loam and fine gravel (greyish-brown) (auriferous)	1 3
4. Clay, with pretty large water-worn pebbles of quartz, country-rock, laterite and hornblende rock	2 3
5. Yellow and mottled clay resting on bed-rock (decomposed)	0 6
	12 0

As soon as the bed-rock was reached water came in but only in small quantity. The auriferous stratum (No. 3) was not rich. Fourteen dishes were washed and thirteen showed gold. The clay (No. 4) contained a few particles of gold; of three dishes washed two gave a few specks and one none. The decomposed bed-rock (in the condition of wet clay) yielded no gold.

18. Earth taken from a shallow hole sunk near the head of the "flat" and "bottomed" at a depth of four feet was almost non-auriferous: four dishes were washed and one only showed a speck of gold.

19. The slopes of the ranges near Munda-bettu and the edges of the paddy flats for a considerable distance on both sides were carefully prospected. Holes were sunk and excavations made at various points. Forty-one dishes of earth were washed and only twelve gave, in each case, minute specks of gold. Indeed it was barely possible, very often, to see the gold with the naked eye.

20. There is a band of talcose schist running through the hill, but near the hill the rock is the ordinary hard gneiss of the country, and though it contains quartz, it is not intersected by reefs or veins. The direction of the foliation observed was N. 75°—80° W.—S. 75°—80° E.

21. On the hill there is an irregular band of quartz of no great extent and running out altogether not many yards from the spot where it is from eighteen inches to two feet in thickness. It is probably not a vein, but merely an example, on a larger scale, of the thin intercalated bands of quartz which coincide with the direction of the foliation.

22. A great deal of the quartz and ferruginous conglomerate was broken and carefully examined for gold, but none was seen, nor was any found after it was pounded and washed.

23. A few pieces of pale rose-colored and amethystine quartz were found, probably indicating the presence of manganese, iron, and titanio acid. Black oxyd of manganese in minute quantities and small scales of chlorite, talc-chlorite and very small patches of iron pyrites are associated with the quartz, but not commonly; and grains of titanio iron and magnetic iron remained in one or two dishes after "washing off."

24. The natives appear to have entirely neglected the quartz and to have sought for gold only in the detritus lying on the slope of the hill. They say that the gold was found in the "ironstone."

25. The hills immediately above Munda-bettu are covered with a deposit of the so-called laterite. The features presented, more particularly when viewed from a distance, are exactly similar to those seen in volcanic tracts; the laterite where not affected by denudation forming high level plains, and where affected by denudation leaving in many places flat-topped hills, whose character, when the nature of the formation is known, cannot be mistaken. I carefully examined the laterite in the neighbourhood of Mijar and I found it to vary in character. In one place it is almost a conglomerate with much nodular hematite and limonite. The latter minerals are also mammillary and concretionary, showing that chemical changes have taken place since the rock was deposited. It is elsewhere quartzose, and again appears as the ordinary ferruginous clayey rock which is cut and used for building purposes. Not far distant from where the rock is conglomeratic the natives were cutting slabs.

26. The edges of these high plains present a peculiar feature. The rains have carried away the earth and partly undermined the laterite on the edges of the plains, and it has fallen away in blocks and rolled down the hills, and where but slightly moved it appears as bands eight or ten feet in width, separated from the mass forming the plains by deep narrow spaces, and not unlike what would present itself if channels had been cut by man.

27. As far as I could observe, the thickness of the deposit does not in any part exceed twenty feet, and it rests on hard dense undecomposed gneissoid rock.

28. The formation appears to have a slope towards the sea. Lithologically some hand specimens do not differ from the recent fossiliferous marine tertiary of the southern part of Australia—thin deposits which were formed in shallow water.

29. The laterite plains were once continuous over many miles of country as evidenced now by the flat-topped hills widely separated from one another.

30. I examined this formation also at Gannymutta, where the same features are seen. Near Gannymutta and below the level of the laterite and separated from the adjacent hills by a narrow valley is a dome-shaped mass of granitoid gneiss; much of it not distinguishable from granite when broken in small pieces, but its true character is easily seen *in situ*. The direction of the foliation is N. 50° W. It weathers in large flakes, from two to several inches in thickness, conformable to the line of curve of the dome, and is thus easily quarried.

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MANGALORE,
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From

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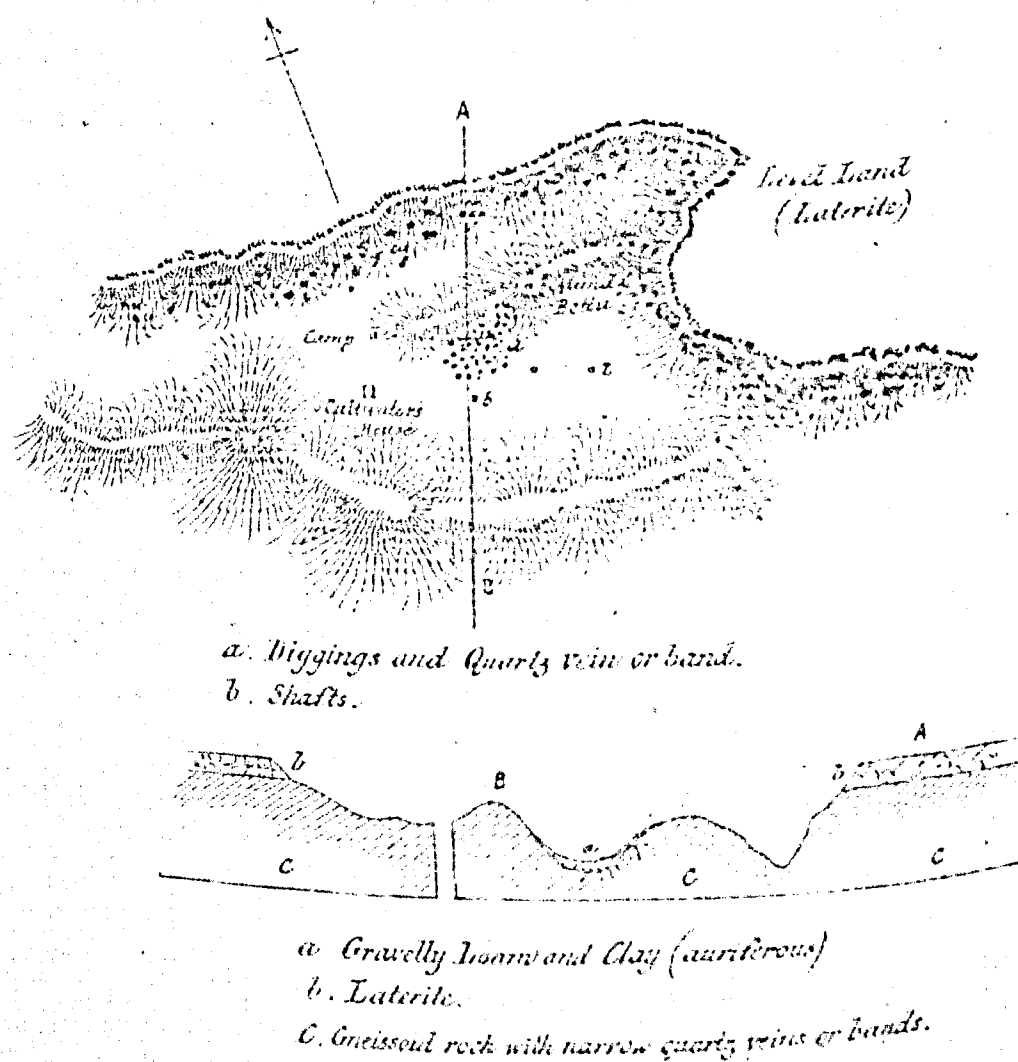
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32. Great difficulties presented themselves in attempting to prospect at Mijar. Water could be got only from wells, and I found it impossible to procure sufficient labor. Sometimes I had two coolies, sometimes four and occasionally six. The men were old and feeble, and apparently unaccustomed to work with the mamoty and pick-axe.

33. On the 1st May 1868, the Acting Collector of South Canara reported that different applicants had offered as much as 200, 500, and 600 rupees for the privilege of working the hill known as Munda-bettu, and that one native had offered to pay a higher rent than all the other applicants.

The offer of 600 rupees was for the exclusive right to work the whole of the hill for the period of one year and-a-half. These offers were made probably either for the purpose of sub-letting or under the belief that the whole hill would prove as rich as the patch first found. The natives are superstitious, and they no doubt firmly believe in the legend* connected with the discovery of gold on the hill, and it is therefore not surprising that they made such offers as those described. Moreover, there may be small patches of rich earth as yet untouched on Munda-bettu and on the neighbouring hills; but it would be only possible to discover these, if they exist, during the monsoons.

34. The result of my examination of this area of country is that it is not likely to yield gold in such quantities as to induce Europeans to undertake mining enterprises; it is not intersected anywhere by quartz reefs in the places seen by me, and I cannot learn that quartz reefs have been found by any one.

The alluviums during the monsoons will no doubt be worked by natives who are not able to obtain employment at ordinary wages; and they may, perhaps, occasionally find more than sufficient gold for their support, but few will abandon their ordinary occupations to follow gold-mining at Mijar.

35. I have received every possible assistance from the officers of the Government in this district. Mr. W. H. Comyn, the Collector, instructed his subordinates at Karkal and Mudbidiri to give me such aid as I required, and I am greatly indebted also for the prompt and friendly help rendered by Mr. B. C. Leggatt, the Treasurer, and Mr. Herbert Bradley, the Assistant Collector.

36. During the period of my stay at Karkal and Mijar Mr. Thomas Laing washed altogether one hundred and seven dishes of earth and pounded rock.

37. I left Mijar on the 29th February, and arrived at Mangalore on the same day at 4 P.M.

* The following account of the cause of the occurrence of gold on Munda-bettu is given by the Jains:—"Many years ago treasure was hidden by the Jains on the western slope of Munda-bettu. It lay there a long time. About twenty-two years ago a dreadful thunderstorm occurred and the hill was 'struck by the thunder'; the treasure was melted and spread over all the hill. Then men came, saw it in the morning, and one found a piece of melted gold. After that men dug for gold."

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) R. BROUGH SMYTH.
Mining Engineer.

11741
Mangalore,

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From R. Brinagh Smith

To J. H. Garstin Esq.,

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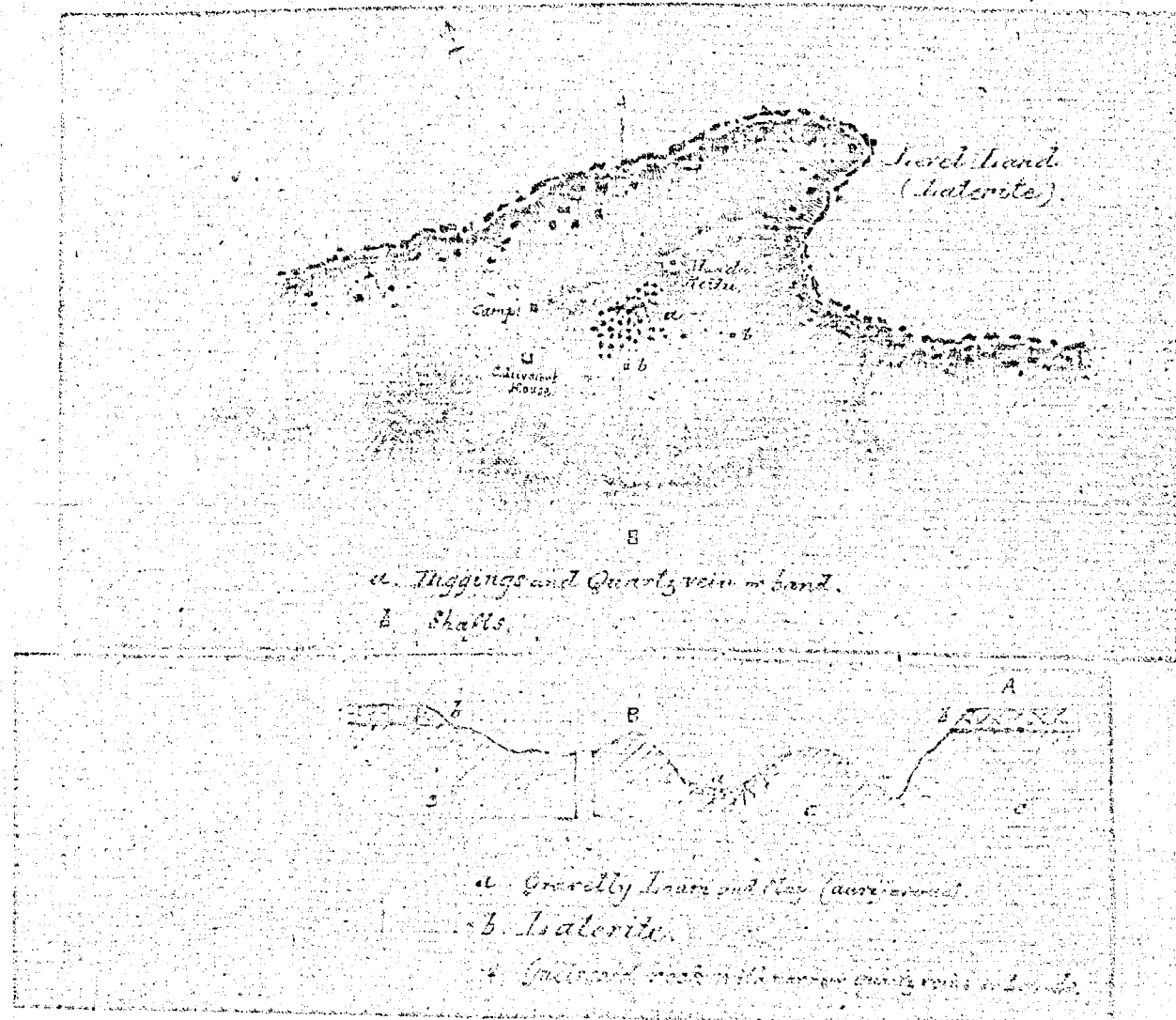
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11. The form and position of Munda-better will be best understood from a sketch-plan and section: -



104/10 5

12. The auriferous soil and detritus are Munda. The latter are composed of loam and clay with small water worn pieces of detritary rock, fragments of laterite mostly in the form of hematite and limonite; and small angular pieces of white and ferruginous quartz. These have been derived partly from the disintegration of the bed-rock and partly from the laterite.

13. The area actually worked by the natives is not more than one acre and a half, and much of it seems to have been turned over several times. At one spot the bed-rock is laid bare over a space of several square yards, and it was here, it is said, that gold was got in considerable quantities. The surface of the bed-rock is irregular - grooved, so to speak, downwards from the summit - and there are consequently variations in the depth of the soil. Water was conserved in shallow excavations, and used either for sluicing or for washing the earth in the wooden dish. There are heaps of "tailings" lying on the surface.

14. The natives at Mirjar say that no profitable work has been done during the past two or three years; that few of them ever mined on the hill, and

that

that nearly all the work was done by men who came down from the flats. Near what is supposed to have been the richest "patch" some earth was taken by Mr. Thos. Loring and washed and one rather coarse speck of gold was found together with some finer particles.

15. The hill was prospected by cutting sections across it at different levels, and by making excavations on and near its summit and by sinking pits down to the bed-rock on and near the "flat".

16. Earth was taken from all these places and washed. Twelve dishes of soil from various parts of the hill showed a few minute particles of gold; of five dishes from the summit one only gave a speck, and one dish from a new cutting near the summit showed no gold.

17. A pit was sunk on the "flat" where I was certain I should find undisturbed ground and thus get a correct section and it showed the following layers from the surface downwards:-

1.

1. Loamy Soil	0	6
2. Sandy clay and gravel and a few small pieces of Carbonised wood	7	6
3. Harsh, dry, mealy loam and fine gravel (greyish-brown) (Miniferous)	1	3
4. Clay, with pretty large water-worn pebbles of quartz, country-rock, laterite and hornblende rock	2	3
5. Yellow and mottled clay resting on bed-rock (decomposed)	0	6
	12	0

As soon as the bed-rock was reached water came in but only in small quantity. ^{The auriferous stratum (No 3) was not reached. Fourteen dishes were washed and only one showed gold.} The clay (No 4) contained a few particles of gold: of three dishes washed two gave a few specks and one none. The decomposed bed-rock (in the condition of wet clay) yielded no gold.

18.

18. Earth taken from a shallow hole sunk near the head of the "flat" and "battered" at a depth of four feet was almost non-auriferous: four dishes were washed and one only showed a speck of gold.

19. The slopes of the ranges near Munda-bettu and the edges of the paddy flats for a considerable distance on both sides were carefully prospected. Holes were sunk and excavations made at various points. Forty-one dishes of earth were washed and only twelve gave, in some cases, minute specks of gold. Indeed it was barely possible, very often, to see the gold with the naked eye.

20. There is a band of talcose schist ~~running through the hill~~ but near the hill the rock is the ordinary hard gneiss of the country, and though it contains quartz it is not intersected by reefs or veins. The direction of the foliation observed was N. 75° - 80° W - S. 75° - 80° E.

21. On the hill there is an irregular band of quartz of no great extent and running out altogether not many yards from the spot where it is from eighteen inches to two feet in thickness. It is probably not a vein, but merely an example on a larger scale, of the thin intercalated bands of quartz which coincide with the direction of the foliation.

22. A great deal of the quartz and ferruginous conglomerate was broken and carefully examined for gold but none was seen - nor was any found after it was pounded and washed.

23. A few pieces of pale rose-colored and amethystine quartz were found probably indicating the presence of manganese, iron, and titanio acid. Black oxyd. of manganese in minute quantities and small ^{scales} of chlorite, talc-chlorite and very small patches of iron pyrites are associated with the quartz but not commonly

commonly; and grains of titanite, iron
and magnetic iron remained in
one or two dishes after "washing off."

24. The natives appear to have
entirely neglected the quartz, and
to have sought for gold only in the
detritus lying on the slope of the
hill. They say that the gold
was found in the "ironstone."

25. The hills immediately above
Munda-betta are covered with a
deposit of the so-called laterite. The
features presented, more particularly
when viewed from a distance, are
exactly similar to those seen in volcanic
tracts — the laterite where not affected
by denudation forming high level
plains, and where affected by
denudation, leaving in many
places flat-topped hills — whose
character, ^{when the nature of the formation is known,} cannot be mistaken.

I carefully examined the laterite in
the neighbourhood of Mijax and I
found it to vary in character.

In one place, it is almost a
conglomerate

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conglomerate with much nodular hematite
and limonite. The latter minerals
are also mammillary and concretionary,
showing that chemical changes have
taken place since the rock was deposited.
It is elsewhere quartzose, and again
appears as the ordinary ferruginous
clayey rock which is cut and used
for building purposes. Not
far distant from where the rock is
conglomeratic the natives were
cutting slabs.

26. The edges of these high plains
present a peculiar feature. The
rains have carried away the earth
and partly undermined the laterite
on the edges of the plains, and it has
fallen away in blocks and rolled
down the hills, and where but
slightly moved it appears as
bands eight or ten feet in
width, separated from the mass
forming the plains by deep narrow
spaces, and not unlike what
would

would present itself if channels had been cut by man.

27. As far as I could observe, the thickness of the deposit does not in any part exceed twenty feet, and it rests on hard dense undecomposed gneissoid rock.

28. The formation appears to have a slope towards the sea. Lithologically some hard specimens do not differ from the recent fossiliferous marine Tertaries of the Southern part of India - thin deposits which were formed in shallow water.

29. The laterite plains were once continuous over many miles of country as evidenced now by the flat-topped hills widely separated from one another.

30. I examined this formation also at Gungmutta where the same features are seen.

Near Gungmutta, and below the level of the laterite and separated from the adjacent hills by a narrow

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narrow valley is a dome-shaped mass of granitoid gneiss - much of it not distinguishable from granite when broken in small pieces, but its true character is easily seen in situ. The direction of the foliation is $N. 50^{\circ} W.$ It weathers in large flakes, from two to several inches in thickness, conformable to the line of curve of the dome, and is thus easily quarried.

31. The earth lying immediately beneath the laterite, and the laterite founded (from different localities) were washed but no gold was found in them.

32. Great difficulties presented themselves in attempting to prospect at Mijar. Water could be ^{got} only from wells, and I found it impossible to procure sufficient labor. Sometimes I had two coolies, sometimes four and occasionally six. The men were

old and feeble and apparently
unaccustomed to work with the
mamak and pickaxe.

33. On the 1st May 1868 the Acting
Collector of South Canara reported
that different applicants had offered as much as
200, 500 and 600 rupees for the privilege of
working the hill known as Munda-betta,
and that one native had offered to pay a
higher rent than all the other applicants.

The offer of 600 rupees was for the exclusive
right to work the whole of the hill for the period
of one year and a half.

These offers
were made probably either for the purpose of
sub-letting or under the belief that the whole
hill would prove as rich as the patch first
found.

The natives are superstitious,
and they no doubt firmly believe in the legend*

* The following account of the cause of the occurrence of gold on
Munda-betta is given by the Jains:— "Many years ago
treasure was hidden by the Jains on the western slopes
of Munda-betta. It lay there a long time. About twenty
two years ago a dreadful thunderstorm occurred and the
hill was struck by the thunder; the treasure was
melted and spread over all the hill. Then
men came, saw it in the morning, and one
found a piece of melted gold. After
that men dug for gold."

17th/15 (10)
connected with the discovery of gold on the hill,
and it is therefore not surprising that
they made such offers as those described.

Moreover there may be small patches
of rich earth as yet untouched on Munda-
betta and on the neighbouring hills; but
it would be only possible to discover these
if they exist, during the monsoons.

34. The result of my examination of this
area of country is that it is not likely to
yield gold in such quantities as to induce
Europeans to undertake mining enterprises;
it is not intersected anywhere by quartz reefs
in the places seen by me, and I cannot
learn that quartz reefs have been found
by anyone.

The alluvium during the monsoons
will no doubt be worked by natives who
are unable to obtain employment at
ordinary wages; and they may perhaps
occasionally find more than sufficient
gold for their support, but few will
abandon their ordinary occupations to
follow gold mining at Mijar.

35. I have received every possible
assistance from the officers of the
Government in this district. Mr.
W. H. Connyn, the Collector, and
his subordinates at Karkal, Mudbidre
to

to give me such aid as I required, and I am
greatly indebted also for the prompt and
friendly help rendered by Mr. B. G. Loggath,
the Treasurer, and Mr. Herbert Bradley,
the Assistant Collector.

36. During the period of my stay
at Karkal and Mijar the Thamarani
washed altogether one hundred and seven
dishes of earth and pounded rocks.

37. I left Mijar on the 27th Feb^y.
and arrived at Mangalore on the
same day at 4 P.M.

I have the honor to be,

Sir,

Your most obedient servant,

R Brough Smyth

Recd 10th March
1880

Revenue 1880

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From

R Brough Smyth Esq
Manning Engineer

Shell

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Reporting the
work done between
the 8th and 29 February
1880, at Mijar, South
Canara.

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With order

Revenue 1880 Sept
No 1534.

From

W. T. A.

R. Brough Smythe Esq.
Mining Engineer

27th 2
24/10 3 March

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29th February 1880, at
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2 Sept 1880 3d Jan 1881

1 Dec 1880 1 Jan 1881

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