

## Letter to Roderick I. Murchison, [August 1855]

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[0001]

[...]embua ^ the rivers above its confluence with this arm,  
and the great body of flowing, deep, water  
it there contained - (from 80 to 100 yards ^ wide) & made  
me believe that it receives a supply from  
the Northern as well as from the Southern  
end of Dilolo - the fever having there caused  
vomiting of large quantities of blood, I ~~had~~could  
~~no inclination to~~not return and examine  
the curious phenomenon more minutely.  
But I consider it as almost quite certain  
that Lotembua ~~part~~the Lake Dilolo divides its waters between  
the Atlantic and Indian Oceans. ~~Thus~~  
a portion ^ flows down the Casai, # to the Zuiré or  
Congo, and another down the Leeba, # to the  
Zambesi. - the whole of the adjacent  
country is exceedingly flat. In coming  
to the Lotembwa from the North, we crossed  
a plain 24 miles broad, & so level ^ that the  
rain water stands on it for months  
together; and when going North we waded  
through another ^ plain to the south of the Northern Lotembwa  
5 15 miles broad, ~~and~~with and a foot of wat[...][er]  
on [...]

[0002]

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~~Dilolo and the Lotembuas seem~~ [...]

As the ^ Royal Geographical Society ~~is supposed to collect~~receives  
Geographical information from every  
quarter, and then acts on the eclectic  
principle of securing the good and true  
from the heaps of nonsense materials which  
travellers abroad and loungers at home  
may send to the crucible - I have with  
less diffidence than I should otherwise  
have felt, resolved to state some ideas  
which observation and native information  
have led me to adopt as to the form of  
the southern part of the continent - It is  
right to state also distinctly that I am

now aware that the same views were  
clearly expressed in the anniversary speech  
of 1852, by the gentleman to whom this  
letter is addressed, yet having come to  
nearly the same conclusions about 3 years  
afterwards and by a different route, the  
reasons which guided my tortoise pace  
may though stated in my own way, be  
accepted as a small contribution to the

[0003]

[...]of the inferences deduced ^ by you by (Sir Roderick Murchison) from the  
study of the map of M<sup>r</sup> Bain -

In passing Northwards to Angola, the  
presence of large Cape Heaths, Rhododendrons &  
Alpine roses, and more especially the sudden  
descent into the valley of the Quango near  
Cassangé, led me to believe we had been  
travelling on an elevated plateau - I had hopes  
then of finding an Aneroid at Loanda; but  
having been disappointed in this, I had to  
resort on ~~our~~ my return to ^ observations of the temperature of boiling water as a ~~the next~~  
best means  
of measuring elevations, viz. ~~the point of~~  
~~ebullition of water~~ I have no table at  
hand for ~~turning the~~ reducing degrees into feet, and  
will give therefore a list of observations only -  
~~and~~ if you do not reject the instrument  
altogether it will be allowed that there is  
some plausibility at least in what  
follows -

To	follow	Brisk
ends of lines		Ebulli
		tion
= 4210 feet	Top of the rocks of	- 204°
	Pungo Andongo	
= 3151 - " -	Top of the ascent of	- 206°
	Tala Mungongo	
6 = 2097 - "	Bottom of same as-	- 208°
-	cent	
= 3680 - " -	Bottom of Eastern	- 205°
	Ascent	
= 5278 - " -	Top of Eastern As-	- 202°
	cent	

[0004]

Dilolo		$203^{\circ} = 4741 \text{ feet}$
Confluence of		$203^{\circ} = 4741 \text{ feet}$
Leeambye &		
Leeba		
Linyanti		$= 3521 \text{ feet} - 205$
Lake Ngami		$2600 \text{ to } 3151 \text{ feet} \text{ --- } 206^{\circ} \text{ or}$
		$207^{\circ} == 206 \frac{1}{2}$

The highest point in the district of Pungo Andongo is given to shew that it is lower than the ridge, which I believe is cut through by the valley of Cassangé, in which the Quango now flows - And the top of the ascent of Tala Mungongo which, to the eye, looks much higher than the Eastern ascent, is if we may depend on the point of ebullition as an approximation, - is in reality much lower; indeed not more elevated than Lake Ngami, which is clearly in a hollow. In coming along this elevated land towards the Quango, we were unconsciously near the crest of a large oblong mound or ridge which probably extends through  $20^{\circ}$  of Latitude and gives rise to a remarkable number of rivers thus, the Quango on the North; the Coanza

[0005]

4<sup>th</sup> Sheet

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on the West; the Langebongo which the latest information ~~makes~~ identifies with the Loeti, - & the numerous streams which unite and form the Chobé, on its South West; All the feeders of the Casai, and that river itself on the East; and probably also the Embarrah or river of Libébé, on the south - Yet  $\wedge$  this elevation is by no means mountainous - The general direction of all these rivers, except the Coanza and Quango, being towards the centre of the continent, with Northing or Southing in addition, according as they belong to the Western or Eastern main drains of the country, clearly implies the hollow or basin - form of that portion of Intertropical Africa. the country about  $\wedge$  Lake Dilolo seems to form a partition in the basin, hence

the partition of the waters of Lotembwecontrary directions of its outlets.

Viewing the basin from the Northward,  
7 we behold an immense flat, intersected  
by rivers in almost every direction, and  
these are not South African mud, sand,

[0006]

or stone rivers either, but deep never failing  
streams, fit to form invaluable bulwarks  
against enemies, who can neither swim  
nor manage canoes - ~~And~~ They have also  
numerous departing Dry anastomosing and reentering branches  
with lagoons and marshes adjacent, so  
that it is scarcely possible to travel  
along their banks without ^ the assistance of canoes. ~~following.~~  
We bought two donkies asses as a present from  
certain merchants in Loanda to Sekelétu,  
and as this animal is not injured by  
the bite of the Tsetse, they came as frisky  
as kids, through all the flowing rivers  
of Londa; but when we began to descend  
the Leeambye, dragging them almost hourly  
through patches of water or lagoons, ^ they were nearly  
killed ~~them~~, and we were obliged to leave  
them at Naliele. These valley rivers  
have generally two beds, one of low water  
and another of inundation - The period  
of inundation does not correspond with  
the rainy season here, but with a period  
subsequent to that in the North - the  
flood of the Leeambye occurs in February  
and March while that of the Chobe from its

[0007]

being more tortuous, is a month later. We hear of  
its ~~as~~being flooded 40 miles above Linyanti, 8 or 10 days  
before it overflows there - ~~But~~ When ~~they~~these rivers do  
overflow then the valley assumes the appearance  
of being ornamented with chains of Lakes,  
~~and~~ This is probably the geologically recent  
form ~~in~~ which the great basin shewed;  
for all the low water channels in the flats,  
are cut out of soft calcareous tufa,  
which the waters of this country formerly  
deposited most copiously The country  
ajacent to the beds of inundation is,  
except where rocks appear, not elevated

more than from 50 to 100 feet above the general level.

That the same formation exists on the Eastern side of the country I ~~never~~ appears from the statements of Arabs or Moors from Zanzibar. They assert that a large branch of the Leeambye flows from the country of the Banyassa (Wunyassa) to the South West, and passes 8 near to the town of Cazembé. It is called Loapola - The Banyassa live on a ridge parallel to the East coast,

[0008]

and though they have no Lake in their own country, they frequently trade to one, on their N.N.W. My Arab informants pass this lake on their way ~~home~~ back to Zanzibar. It is said to be ten days North East of Cazembé, and is called Tanganyeñka (Tanganyeñka) and connected with another named Kalágue (Garague?) and Both are stated to be so shallow, ^ that the canoes are punted the whole way accross ^ and the voyage occupies three days. (~~3-days~~) Will it be ~~over~~too speculative to suppose that these large collections of fresh water are ~~nought~~ ~~else~~ but the residua of greater and deeper Lakes just as Lake Ngami is? - the openings in the Eastern ridge not being deep enough to drain those parts of the basin entirely.

In a foray made by the Makololo to the country about East of Masiko's ^ territory, during our visit to Loanda, they were accompanied by the Arab Ben Habib from whom I received much of the above information, ~~and~~ This party saw another river than the Loapola, coming from the North East, with a South West course, to form a

[0009]

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Lake named Shuia (Shooea) - A river emerges thence, which dividing, forms the Bashukulompo and Loangua rivers - There is a connection between these and the Leeambye too, a statement by no means

improbable, seeing the country around Shuia (Lat 14° or 15°; Long 27° or 28°E.?) is described as abounding in marsh and reedy vallies.

When there, the Arab pointed to the Eastern ridge, whence the rivers come, and said "When we see that we always know we are about to begin the descent of ten or fifteen days to the sea"

I am far from craving implicit faith in those statements, for ~~so many~~ of my informants possess a sad proneness to "amiability" ~~and~~ they will roundly assert whatever they ~~guessthink~~ will please you. "Are you happy as a slave" ? "O, infinitely more so than when I was free." but my object in making enquiries, was unknown and when supported 9 by the testimony of the Makololo, the statements may be taken as supporting the view

[0010]

that the central parts of Africa south of the equator though considerably elevated above the level of the sea, form really a hollow in reference to two oblong ridges on its Eastern and Western sides - As suggestive of further enquiry only, I may mention, though not pretending to have examined the pretty extensive portions of the country, which came under my observation, with the eye and deep insight of a geologist, ^ that the general direction of the ranges of hills ^ appears ~~being~~ to be parallel to the major axis. - the dip of the strata ~~being~~ down towards the centre of the country, led to the conclusion, before I knew of the existence of the ridges, - that Africa had, in its formation, been pressed up much more energetically at the sides than at the centre - the force which effected this may ha[...]ve] been of the same nature as that which determined most recent volcanoes to be in the vicinity of the sea - this seems to have been the case in Angola at least, and having probably been in operation over a vast extent of coast, ~~probably~~ decided the very simple littoral outline of Africa.

[0011]

I am induced to make this suggestion, because

when the ridges are situated far from the coast,  
they do not seem to owe their origin to  
recently erupted rocks - ~~We have~~ There is a section  
of the Western ridge near Cassangé, of nearly  
a thousand feet ~~perpendicularly~~ in height, and except  
a capping of Haematite mixed with quartz  
pebbles, it is a mass of the red clay slate,  
termed in Scotland "Keel"; the thin strata  
of the continent of which are scarcely at all disturbed - (this  
keel is believed to indicate gold. Had I met  
with a nugget I would have mounted a  
mule instead of the ungainly beast I rode.)

I have mentioned ^ the locality of Lake Dilolo, as forming  
a sort of partition in the ^ central valley, but it is  
not formed by outcropping rocks, ^ as one  
may travel a month beyond Shinte's, without  
seeing a stone. But in proceeding south  
of Ngami, the farther we go the greater  
has been the filling up - the 25<sup>th</sup> parallel  
of Latitude divides a part of the valley,  
containing one thousand feet more filling up  
10 than that North of Kolobeng; and strangely  
enough, the only instance of a large

[0012]

transported boulder, occurs first at the  
edge of the more hollow part - the plains to the  
south of that, are all elevated perhaps 5000 feet  
above the level of the sea - But the erupted  
rocks, as that on which Kuruman stands,  
have brought up fragments of the very old  
bottom rocks in their substance.

As I am not aware ~~whether the Rev<sup>d</sup>~~ that the late  
D<sup>r</sup> Buckland made any public use  
of a paper ^ which I sent ^ to him in 1843, on the gradual  
desiccation of the Bechuana country, it  
may not be improper to mention ~~that~~,  
in support of the actual drying up of  
all the rivers, which have a westerly  
course, that I pointed out the bed of a  
still more ancient river, than those  
trickling rills which now pass by the  
name - It flowed from North to South  
exactly as the Zambesi does now, and  
ended in a large ^ Lake which must have  
been discharged when the ~~fizzure~~ fissure was  
made, through which the Orange river  
now flows. At the point of confluence

between River and Lake, some hills

[0013]

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of amygdaloid, caused an eddy, and  
in the eddy we have a mound of tufa  
and travertin full of fossil bones - From  
these I had hopes of ascertaining the age  
of the river; but in addition to ^ my time being  
much restricted by sacred duties ~~as to~~  
~~time (I have been singularly unfortunate~~  
~~in learning geology.)~~ I had no instrument  
with me when I discovered these beautiful  
fossils, which stand out in relief on the  
rock - On the second occasion I was  
called off by express to the child of another  
missionary, and galloped a hundred miles  
to find him in his grave. ~~and~~ To crown  
all, some epiphyses and teeth ^ which I ~~picked up,~~  
~~when~~ sent with specimens to illustrate  
the geology of the Interior, though taken  
to England by the Rev. H. H. Methuen,  
were stolen from the railway before.  
reaching ~~the venerable~~ Doctor's ^ Blickland's hands.  
As it is not likely ^ that I shall ever visit  
the spot again, I may mention that  
11 the mound is near Bootschap, and  
well known to the Rev H. Helmore, who

[0014]

would willingly shew it to any one desirous  
of procuring specimens. they are perfectly  
fossilized and ~~in size resemble those of~~ about the same size as  
Zebras or buffaloes.

With respect to the spirit in which  
our efforts have been viewed by the  
Makololo, I think there is no cause  
for discouragement - the men of  
my company worked vigorously  
while at Loanda, and their savings ~~saved what~~  
~~to them~~ appeared ^ to them to be considerable ~~property~~.  
But the long journey back forced  
us to expend all our goods; and  
on arriving at the Barotsé, we were  
all equally poor. Our reception  
and subsequent treatment were



however, most generous and kind.  
the public reports delivered by my  
companions, were to me sufficiently  
flattering ^, and their private opinions  
must have been in unison, for

[0015]

many volunteers have come forward  
~~uncalled for~~unasked, to go to the East. A fresh  
party was dispatched with ivory for  
Loanda, and only two days ^ were allowed for  
preparation - they are under the guidance  
of the ~~afore-mentioned~~ Arab from Zanzibar,  
already alluded to, and  
the men haveng no voice in the disposal  
of the goods - they are simply to look  
and learn. After my late companions  
have rested sometime, it is intended for  
~~that they~~them to return as independant traders -  
~~and so of the others~~this was not my  
suggestion, indeed I could scarcely  
have expected it; for the hunger and  
fatigue they endured, were most trying  
to men who have abundance of food  
and leizure at home. But the spirit  
of trade is ~~very~~ strong in the Africans,  
and they are ~~se~~much elated with the large  
prices given at Loanda. // If no untoward  
12event interferes a vigorous trade will  
certainly be established - the knowledge

[0016]

of the great value of ivory puts a stop to  
the slave trade in a very natural way, as  
our cruizers on the West coast render  
property in slaves of very small value  
there - the Mambari, who are generally  
subjects of Kangombe of Bihé ~~or~~  
Bié purchase slaves for domestic  
purposes only; but to make such  
a long journey as that from Bié  
to the Batoka Country, East of the  
Makololo, at all profitable, they  
must secure a tusk or two. These  
can only be got among certain  
small tribes, who depend chiefly  
on agriculture for subsistence,

and are so destitute of iron, ^ that they often  
 use hoes of wood - they may be  
 induced to part with ivory and  
 children for iron implements, but  
 for nothing else - the Mambari tried  
 cloth and beads unsuccessfully, but  
 hoes were irresistible, the End

[0017]

[diagram illustrating altitudes of various locations by means of a line graph]

~~10° Latitude South~~ Remarks.

- 1) Lowlands adjacent  
 to come with the Section to rivers and extending  
 about 50 miles from  
 the coast - composed  
 chiefly of calcareous  
 Tufa and a marly  
 rock composed of lime &  
 friable clay, containing  
 many sea shells. modern  
 near the coast, ancient inland.
- 2) Porphyritic trap  
 having dark red angular  
 chrystals embedded in it.
- 3) Pale red sandstone  
 tilted up from the  
 West.

4) Micaceous schist  
 stratified and tilted up  
 a great variety of  
 angles but generally  
 from the West & S.W.

5) Clay s[...][late]  
 sandstone

6) Gneiss  
 coarse sa[...][ndstone]  
 and occas[...][ionally]  
 Haematit[...][e]

7 Large m[...][asses]  
 shingly co[...][nglomerate]  
 300 or 40[...][0]

---

10°This part comes in the Text The above ^ following is an ideal section of the country between  
 9° and 10

of its many imperfections - I would scarcely have ve[...][ntured]  
 the hope of forming a geological map of the country N[...][orth]

collection of specimens of rocks for the purpose - As I d[...][id]  
 I lost both specimens and papers in the destruction of  
 send any information I can pick up out of harm's w[...][ay]  
 Between 3 and 4 in the district of Cazengo the ign[...][eous]  
 in the mountain ranges 4444 and have tilted up  
 cracks filled with a dark blue rock exactly like cla[...][y]  
 and Golungo Alto abundance of excellent iron  
 largely impregnated with the metal - To the North  
 so it is said to occur - southwards of 5 from u[...][nder]  
 country - the spot reported is on the banks of the C[...][oanza]  
 the banks of the Coauya in the same district but I  
 masses of conglomerate about 300 or 400 feet abo[...][ve]  
 N. and S. in direction and rather more than a mile in  
 sandstone and this in a very small proportion to the  
 schist, clay, and sandstone, trap syenite greenstone - qu[...][artzite]  
 masses of shingle - there is also a kind of soft limestone

[0018]

[part of diagram illustrating altitudes of various locations by means of a line graph]  
 slate and  
 schist  
 lying under  
 [...]sa]ndstone grit  
 [...]occas]ionally brown  
 [...]Haematit]e  
 [...]m]asses of  
 [...]co]nglomerate  
 [...]40]0 feet high  
 8 Coarse dark red  
 sandstone with pebbles  
 of greywacke, granite  
 clay schist &c in beds  
 the sandstone itself  
 lying in thick horizontal  
 strata  
 9 The same sandstone  
~~but~~ without pebbles but  
 having much yellow mica scales  
 10 Soft bright red  
 clay which gradually  
 becomes harder as  
 we descend to the  
 bottom of the valley  
 a mountain called  
 Casala near the village  
 Casamsange has the very  
 same structure as the descent  
 11- No rocks  
 appear above

ground till we  
approach the  
Zambesi  
the opposite  
descent has  
the same red  
clay structure

---

° South Latitude and 13° - 18° East Longitude is sent with a sense  
[...][ve]ntured to send it at all in its present state - but having once indulged  
[...][N]orth of the Orange river as far as Lake Ngami I made a very extensive  
[...][d]id not know many of them while waiting for farther information  
Kolobeng by the Boers - this misfortune makes me anxious to  
way. The following additional remarks may not be out of the way.  
[...][ign]eous rocks indicated at 2 have evidently ran through gorges  
schist, gneiss &c. and in the latter veins may be seen or rather  
[...][cla]y slate - Between 3 and 4 too in the districts of Cazengo  
ore occurs - some strongly magnetic, others<sup>^</sup> parts not; but all very  
of 2 and 3 near the river Dande Petroleum is reported - and  
[...][u]nder the dark red sandstone which forms the crust of the  
Coauya and near Cambambe. Veins of copper appear on  
did not see them - the rocks of Pungo Andongo (7) are large  
[...][abo]ve the surrounding country - they stand in parallel lines nearly  
length the conglomerate stands on horizontal strata of dark red  
other materials forms the matrix - there are granite, gneiss, porphyry,  
[...][qu]artzite &c &c all rounded and waterworn and forming immense  
containing sea sh[...][ells] on the tops of some of the rocks D.L.