

Letter to Roderick I. Murchison, [August 1855]

Livingstone, David, 1813-1873

Published by Livingstone Online (livingstoneonline.org), 2017

[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

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[...]of the inferences deduced [^] by you ~~by~~ (Sir Roderick Murchison) from the study of the map of M^r 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 ends of lines		Brisk Ebulli tion
= 4210 feet	Top of the rocks of Pungo Andongo	- 204°
= 3151 - " -	Top of the ascent of Tala Mungongo	- 206°
6 = 2097 - " -	Bottom of same ascent	- 208°
= 3680 - " -	Bottom of Eastern Ascent	- 205°
= 5278 - " -	Top of Eastern Ascent	- 202°

[0004]

Dilolo	$203^\circ = 4741$ feet
Confluence of Leeambye & Leeba	$203^\circ = 4741$ feet
Linyanti	$= 3521$ feet - 205
Lake Ngami	2600 to 3151 feet --- 206° 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° of Latitude and gives rise to a remarkable number of rivers thus, the Quango on the North; the Coanza

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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 ^ 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 ^ Lake Dilolo seems to form a partition in the basin, hence

the ~~partition of the waters of Lotembwe~~contrary 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

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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
adjacent 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,

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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 ~~overt~~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

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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

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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.

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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 25th 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

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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^d~~ that the late D^r 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

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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 sòmuch 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[^] 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.