

## Letter to Roderick I. Murchison, 25 January 1856

*Livingstone, David, 1813-1873*

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[0001]

Hill Chanyuné, on the

banks of the Zambesi.

25<sup>th</sup> January 1856

Nº II [London]

[15 Whitehall Pl]

~~Sir Roderick Impey Murchison~~

Sir -

As we are now within a few days of the Portuguese station called Teté, I shall begin preparations for entering the world again while my men are engaged in paddling each other accross this broad river, by giving you a sketch of our progress thus far.[Pers things to be disregarded][stet]~~No I. was written while waiting for rains at Linyanti and refers chiefly to the country North of that point. And this No II. is intended as a sort of continuation, but directed principally to the Eastern side of the continent.~~

When passing Seshéké in our way down the river in November last, the chief Sekéletu generously presented [0002] ten slaughter cattle and three of the best riding oxen he could purchase among his people, together with supplies of meal and everything else he could think of for my comfort during the journey. Hoes and beads were also supplied to purchase a canoe, when we should come to the Zambesi again, beyond the part where it is constricted by the rocks. these acts of kindness were probably in part prompted by the principal men of the tribe, and are valuable as shewing the light in which our efforts are viewed. But as little acts often shew character more clearly than great ones, I may mention

that - having been obliged to separate from the people, who had our luggage, and to traverse about 20 miles infested by the Tsetsé during the night, - it became so pitchy dark, we could only see by the frequent gleams of lightning which at times revealed the attendants wandering hither and thither in the forest. The horses trembled and groaned, and after being thoroughly drenched by heavy rain we were obliged [0003]

to give up the attempt to go farther and crawled under a tree for shelter. After the excessive heat of the day, one is peculiarly sensitive to cold at night. the chief's blanket had fortunately not gone on. He covered me with it and lay[rested] himself on the cold wet ground untill the morning. ~~If such men must perish before the white man race by an immutable law of Heaven, we would must seem to be under the same sort of "terrible necessity" in our "Caffre wars" as the American professor of Chemistry said he was, to when he dismembered the man whom he murdered.~~ Our

convoy down to Mosioatunya[ Mosi-oa-Tunya] consisted of the chief and about 200 followers.

About ten miles below the confluence of the Chobé and Leeamby or Zambesi, we came to the commencement of the rapids[.], ~~and there~~[L]eaving the canoes [there,] [we] marched on foot about twenty ~~more~~, [miles further,] along the left or Northern bank to Kalai otherwise called the island of Sekoté. As i[I]t was decided by those who [^][well] know the country well in front, that we should [0004]

here leave the river, and avoid the hilly[s] ~~country~~, through which it flows, both on account of tsetsé and extreme ruggedness of the path. Bb[B]y taking a North East course ~~in order to meet~~ the river[^][would be met again] where it has become placid again. [^][Before leaving this part of the river] I took a canoe at Kalai and sailed down to look at [^][the falls of Mooatunya which proved ][to]by far[be] the finest sight I have in Africa. Tt[T]he distance to the "smoke sounding" falls of the Zambesi was about eight miles in a S.S.E. direction, but when we came within five miles of the spot[,], we saw five large columns of "smoke" ascending about 300 feet[,]& exhibiting exactly ~~as occurs during~~ [the appearance which occurs on] extensive grass burnings in Africa. The river above the falls is very broad[,], but I am such a miserable judge of distances on water[,], [that]I fear to ~~name a sum~~ [to estimate its breadth]. I once shewed

a naval officer a space in the bay of  
Loanda[,] which seemed of equal breadth  
with parts of the river which I have always  
called 400 yards. He replied "that is 900 yards".

Here I think I am safe in saying ~~the~~  
it is at least a thousand yards wide. You

[0005]

2 Sheetcannot imagine the glorious loveliness of the scene  
from anything in England. The "Falls" if we may  
so term a river leaping into a sort of strait jacket  
are bounded on three sides by forest-covered ridges  
about 400 feet in height. ~~(It is a pity there are no mountains beyond.)~~ Numerous islands are  
dotted over the river above [^][the falls,] and both banks  
and islands are adorned with sylvan vegetation  
of great variety of colour and form. At the  
period of our visit many of the trees were spangled  
over with blossoms, and towering above them  
all stands the great burly baobab each of  
whose (syenite coloured) arms would form  
the bole of a large ordinary tree. Groups of  
graceful palms with their feathery[-] formed  
foliage ~~lend their~~[contribute to the] beauty ~~to~~[of] the islands. As  
a hieroglyphic[,] they always mean "far from home"  
~~for~~[to] one [^][who] can never get over their foreign ~~out~~[aspect]  
in picture or landscape. Trees of the oak  
and other familiar forms stand side by side  
with the silvery Mohonono[,] which in the tropics,  
looks like the cedar of Lebanon. ~~And~~[T]he  
dark cypress[-] shaped Motsouri laden with

[0006]

its pleasant scarlet fruit[,] and many others  
[also] attain individuality among the great rounded  
masses of tropical forest. We look and look  
again and hope [^][that] scenes so lovely ~~as must have~~[enough to]  
~~arrested~~ the gaze of angels ~~in their flight~~[,] may  
never vanish from ~~the~~ memory. A light  
canoe and men well acquainted with the still  
water caused by the islands, brought us to an  
islet[,] situated in the middle of the river and  
[forming][^][the] edge of the lip over which the water rolls[.]e[C]reeping  
to the verge, we peer down into a large rent  
which has been made from bank to bank  
of the broad Zambesi[,] and [^][there we] see the stream of  
a thousand yards [^][in breadth] suddenly compressed into [a]  
[channel of] fifteen or twenty. ~~If you~~[I]magine the  
Thames filled with ~~low~~ tree covered hills  
~~immediately beyond~~ the Tunnel ~~and as far as~~[to] Gravesend -[,] ~~the~~[its] bed of hard basaltic rock  
instead of London mud and a rent or  
fizz[ss]ure made ~~therein~~[in the bed] from one end of the  
tunnel to the other down through the keystones  
of the arch, ~~the pathway being one hundred feet below the bed of the river instead of what it~~

is and [to a depth of one hundred feet] the lips of the fizzle [being] from  
 [0007]  
 sixty to eighty feet apart - suppose farther the  
 [narrow] rent prolonged [from the Tunnel to] as far as Gravesend [along] from the  
 left bank, and [the] Thames leaping bodily  
 into the gulph, compressed into fifteen or twenty  
 yards at the bottom, forced to change its direction  
 and go from the right to the left bank, then turning  
 a corner and go boiling and roaring through  
 the hills, and you have [may conceive] something of what takes place with [similar to this part  
 of] the Zambesi.

It [the river] is reported to run in [rush through] the rent about thirty  
 miles in an E.S.E. direction, and when quit [free]  
 of [from] its place of confinement [it] flows placidly  
 again but away to [towards] the North East, till it  
 gains [reaches] the Latitude of  $15^{\circ} 37' S$  where I [am] now write [ing].  
 The falls are in  $17^{\circ} 57' S.L.$  The side of the fizzle opposite to that over which the river  
 does not fall, is quite perpendicular and has a straight edge, except at the left hand corner  
 where a rent being visible, a piece seems inclined to fall off. It is composed of one unstratified  
 rock. The side over which the river precipitates itself is perpendicular too; but in three  
 of the five or six parts into which the waterstream is divided at low water, about three feet of  
 the edge of the lip is worn off. Several pieces also having fallen in give this lip a serrated edge;  
 but the water falls at once clear of the rock and becomes a fleecy mass as white as snow. The  
 pieces of water, if I may so express myself, do not at once lose their cohesion, but in falling give  
 off in their down ward course streams of vapour exactly as comets are represented on paper,  
 or as a piece of steel when burned in oxygen gas. The beautiful mass thus resembles a  
 thousand comets speeding on their course. On looking down into the fizzle on the right of  
 the island where the largest quantity of water falls, we see nothing is seen but a dense white  
 cloud with two bright rainbows on it. (It was about midday and the Declination of the sun  
 nearly the same as the latitude when we visited it). An immense stream of vapour rushes up  
 from the cloud unlike anything I ever saw before. When 300 or 400 feet high, it loses its steam  
 colour, becomes dark and descends in a shower, exposure to which for a quarter of an hour  
 wetted us to the skin. A few yards back from the opposite lip, a dense unbroken hedge of  
 evergreen trees stands. Their leaves are constantly wet by from the condensed vapour and  
 from their roots several little rills run back into the gulph, but never reach the bottom;  
 for the ascending columns of vapour literally licks them up. Sheet off the perpendicular wall,  
 before they are half way down. I have estimated the depth at one hundred feet, deep but  
 we cannot see what it is on the right of the island. On the left of the island a large piece  
 has fallen in, and that lying on one side of the chafing river below enables me to give form an  
 approximation. My companions amused themselves by throwing stones down the falls and  
 wondering to see how small they became before they were lost in the cloud. In former days the  
 three  
 principal falls were used as places where  
 certain chiefs worshipped the Barimo  
 (gods or departed spirits) As even at low  
 water, there are from 400 to 600 yards of  
 water pouring over, the constancy and  
 loudness [of the] sound of the flow may have produced  
 feelings of awe, as if the never-ceasing  
 flood came forth from the footstool of

the e[E]ternal. It was mysterious to them  
 for one of their canoe songs says  
 " The Liambai, nobody knows  
 Whence it comes or whither it goes."  
 Perhaps the bow in the cloud reminded  
 them of Him[,] who alone is unchangeable  
 and above all changing things. But  
 [0010]  
 not aware of his true character they had no  
 admiration of the beautiful and good in their  
 bosoms. Secure in their [^][own] island fortresses[,]  
 they often inveigled wandering or fugitive tribes  
 on to others[,] which are uninhabited - and left  
 them there to perish. In[that when] being ferried accross  
 t[T]he river is so broad you can often not  
 [^][cannot ]see whether you are going to the mainland or  
 not. To remove temptation out of the  
 way of our friends, we last night drew the  
 borrowed canoes into our midst on the  
 island ~~on which~~[where] we slept, and got some  
 of the men to make[de] their beds in them.  
 I counted between fifty and sixty human  
 skulls mounted on poles in a village  
 near Kalai[,] being those of men slain  
 when famishing with hunger; and felt  
 thankful that Sebituane had rooted  
 out the bloody imperious "Lords of the Isles."

That trade has never extended thus  
 far from either the East or Western coasts  
 is[,] I believe extremely probable from the  
 grave of the elder Sekoté being still seen  
 on Kalai [] ornamented with seventy  
 large elephants' tusks planted round it[,]  
 and there about thirty [^][tusks ]over the resting  
 places of his relatives. Indeed ivory  
 [0011]  
 was used only to form the amulets and  
 grave stones of the rich, and ~~are~~[it is] now met  
 with a rotten state all over the Batoka  
 country. this fact I take as corroborative  
 of the universal assertion[,] that no trader  
 ever visited the country previous to the first  
 and unsuccessful attempt of the Mambari[,]  
 to establish the slave trade with Santuru[,] the  
 last chief of the Barotsé.

Before concluding ~~about~~[this account of] the falls it may  
 be added that it[^][the rent] is reported to be much deeper  
 farther down, 200 or 300 feet perhaps; and at  
 one part the slope down[wards] allows of persons

descending in a sitting posture. Some Makololo  
 once chasing fugitives saw them unable to  
 restrain their flight, [&] dashed to pieces at the  
 bottom. They say the river appeared as a  
 white cord at the bottom of an abyss[,] which  
 made them giddy and fain to leave. [Omit]I suppose the great body of water so forcibly  
 compressed must have worn the rock horizontally as is intended to be shown by the dotted  
 line. TtThe surface of the water at A being very narrow., It must either be very deep or have  
 worn a channel sideways. yYet I could not detect any evidence of wear at the spot which was  
 examined though it was low water, and from seven to ten feet of yellow discolouration on  
 the rock, shewed the probable amount of rise. I have been led to the supposition by the fact  
 noticed by both Captain Tuckey and Commander BedingfieldBedingfeld in the Congo or Zaire;  
 which, as well as the oOrange river,would seems to be discharged by a fizzle through the  
 Western ridge. TtThe breadth of the channel among the hills, where Captain Tuckey turned,  
 will scarcely account for the enormous body of water which appears farther down. Indeed no  
 sounding can be taken with ordinary lines near the mouth, though the water runs strongly and  
 is perfectly fresh.

On the day following my first visit, I returned to take another glance and make a little  
 nursery garden on the island,; for havingI observed that it was covered with trees, many of  
 which I have seen no where else, and ^as the wind often wafted a little condensed vapour over  
 the whole it struck me this was the very thing I could never get my Makololo friends to do. My  
 trees have always perished by being forgotten during droughts; so I planted ^here a lot of peach  
 and apricot stones and coffee seed. And 4 SheetAndnotextaAs the island is unapproachable  
 when the river rises except by hippopotami, if my hedge is made according to contract, I  
 have great hopes of Mosioatunya's abilities as a nursery man. (oOn another island close by  
 your speechaddress of 1852 layremained a whole year. If you had been a lawyer, instead of a  
 geologist, your claims to the discovery would have been strong,seeingas "a bit of your mind"  
 was within sight and sound of the falls, long ^long before the arrival of any European.) I thank  
 you for sending it.

{t[T]he former name of the spot was Shongwé  
 the meaning of which I cannot ascertain.  
 Tt[T]he Makololo in passing near it said "Mosi  
 oa tunya" "smoke does sound". Very few  
 of them ever went near to examine the cause[,]  
 before my visit. When the river is in flood[,]  
 the vapour is seen and [^][the ]sound heard ten or  
 more miles distant. Although I have not  
 felt at liberty to act on my conviction on  
 the subject of names[,] I think all rivers  
 and hills discovered by Englishmen ought  
 to have English names. the African name  
 is known only to people in the locality alone  
 I could not get the name Zumbo lately  
 from the people among the rivers and  
 [0014]

passed Dambarari on the opposite side of the river, nobody having ever heard the name  
 before. TtThe same would have happened of course had they been English or Portuguese  
 names, but we should not have the exruciating nonsense with which by misspelling we and  
 the printers disfigure the maps. See how many ways Bechuanas are mentioned Booshuanas

~~Bootjouanas, Beitjouanas &c &c. Makratta for Makabé. Marelata for Moretelé. Wanketzeens for Bangwaketsé. Beza (God) for Reza. We on the spot are often misled by getting information from foreigners, who pronounce names according to their own dialects, and are there by often guilty of leading those at home astray. English names too are surely better than the round of Dutch names. "sand", "stone", "mud" or "reed rivers". I do not urge the point but I think it merits consideration.)~~

Shaping our course now to  
the North East[,] we left the hills which  
constrict[confine] the river on our right. And  
[0015]  
When we got free of tsetsé and night travelling[,]  
we found a fine[,] open country with gently  
undulating lawns, ornamented with large  
spreading trees[,] which had once give[n] shade  
in towns and villages[,] the ruins of which  
are everywhere visible. there are ~~too~~[^][also] many  
patches of forest[,] but as [it ]often happens  
in this country[,] the wood grows chiefly  
on the hills. the large game has now  
undisturbed occupation of what were  
the pleasant haunts of men[,] and immense  
herds of buffaloes quietly grazing or reclining[,]  
added [to the] beauty ~~to~~[of] the scene.[N.P.]~~the~~[T]he courses of  
the rivulets which have all a mountain  
torrent character[,] as well as the[^][temperature of the boiling]point of ebullition of water[,]  
shewed that we were  
now ascending the Eastern ridge. the  
first [^][stream] is named Lekoné and is perennial[.]  
i[T]t runs in what may have been the antient  
bed of the Zambesi[,] before the fizz[ss]ure was  
made. I could examine it only by the  
light of the moon[,] but then, it seemed  
very like an antient river channel. ~~It~~[The][^][ Lekoné ]runs  
~~back or~~ contrary to ~~that~~[the] direction in which  
the ~~river~~[ Zambesi] did and does now flow [& ]joining[s]  
[0016]  
[the latter] five of six miles above Kalai. If little  
or no alteration of level occured when the  
fizz[ss]ure was formed[,] then the altitude of the  
former channel being only a little higher  
than Linyanti, we have a confirmation  
of what is otherwise clearly evident[,] that the  
Zambesi was collected into a vast lake[,]  
which included not only Lake Ngami  
in its bosom[,] but spread westwards beyond  
Libebé[,] - South wards and Eastwards beyond  
Nchokotsa[.]indeed in many parts south  
of Ngami[,] when an anteater makes a  
burrow[,] he digs up shells identical with those  
now living in the Zambesi. And all the

surface indicated is covered by a deposit of  
 soft calcareous tufa, with which the fresh  
 waters of the valley seem to have formerly  
 been loaded. The Barotsé valley was probably dis-  
 charged by the same means; seeing for Gonyé  
 possesses a fissure character and so does another large cataract situated beyond Masiko's in  
 the Kabompo N.P. It would be interesting to ascertain if these rents were suddenly made and  
 remain so in their original state or whether they are or, are at present progressive. 5 Sheet I had  
 a strong desire to measure a point of that of Mosioatunya but had neither the means of accurate  
 measurement, nor of marking the hard rock afterwards. They have proved drains on a  
 gigantic scale, and if geologists did not require such eternities of time for their operations, we  
 might hazard a hint about a salubrious millennium for Africa. Shall we say that they  
 are geologically recent, because there is not more than three feet worn off the edge subjected  
 to the wear of the water? — and that they are progressive, as the gradual dessiccation of the  
 Bechuana country shewings a slow elevation of the ridges. No one will probably think much of  
 the negative fact, that there is no trace of a tradition in the country of an earthquake. The  
 word is not in the language and though events, centuries old, are sometimes commemorated  
 by means of names, I never met with any approach to one text a Tom. Earthquake or Sam-  
 shake the ground among them. Yet they do possess a tradition, which is wonderfully like the  
 building of the Tower of Babel, ending differently however from that in the Bible, the bold  
 builders having got their crowns heads cracked by the giving way of the scaffolding. There is  
 also the story of Solomon and the harlots, and all refer trace back their origin to coming a time  
 when their forefathers came out of a cave in the North East in company with animals. The  
 cave is termed Loé (Noé) and is exceptional in the language, from having masculine pronouns.

Still ascending the Western side of  
 the ridge we cross another rivulet  
 named Unguesi[,] which flows in the  
 same direction as Lekoné[,] and joins  
 the river [Zambesi] above the point where the  
 rapids begin. the next [^] [tributary] called  
 ["] Kalomo["] never dries[,] and being on  
 the top of the ridge[,] runs South[,] or  
 South and by East[,] falling into the  
 Zambesi below the falls[.] and lastly  
 [0019]  
 [^] [Lastly] we crossed the Mozuma or Dela flowing  
 Eastwards. We continued the Eastern descent  
 till we came to the Bashukulompo River[,]  
 there [where] it may be said to terminate[;] for  
 we had again reached the altitude of Linyanti.  
 We intended to have struck the Zambesi  
 exactly at the confluence[,] but [^] [we] were drawn  
 aside by a wish to visit Semalembué[,]  
 who is an influential chief in that  
 quarter. The Bashukulompo River  
 is here called Kahowhé[;] and farther  
 down the Zambesi[,] it is named  
 Kafué (Kafuocy) Passing through  
 some ranges of hills[,] among which  
 the Kafué also winds[,] we came to the  
 Zambesi, a little beyond the confluence.



It is here much broader than ~~at the~~[that part of it called]  
Leeambye[,] but possesses the same  
character of reedy islands, sand banks  
and wonderful abundance of animal  
life. It was much discoloured by recent  
rains; [^][but as we ]e~~oming~~[came] down along the left bank[,]  
it fell before we had gone 30 miles more  
than two feet . It is never discoloured  
[0020]

above Mosioatunya. Hence I conclude the  
increase or flood was comparatively local[,]  
and effected by numerous small feeders  
on both sides[banks][,] East of the ridge. When we  
ascended it[the Zambesi] towards Kabompo in [^][January] 1854, the  
annual flood[,] which causes inundation[,]  
had begun, and with the exception of sand[,]  
which was immediately deposited at the bottom  
of the vessel[,] there was no discolouration.  
Ranges of hills stand on both banks as far  
as we have yet seen it. ~~Tt~~[T]he usual mode  
of travelling is by canoe[,] so there are generally  
no paths, and nothing can exceed the tedium  
of winding along through tangled jungle[,]  
without something of the sort. We cannot  
make more than 2 miles an hour. Our  
oxen are all dead of tsetse[,] except two[,] and  
the only riding ox is so weak from the  
same cause as to be useless. Yet we are  
more healthy than in the journey to  
Loanda - ~~t~~[T]he banks feel hot and  
steamy both night and day[,] ~~yet~~[but] I have  
[had ]no attack of fever through the whole  
journey. I attribute this partly to [not ]having  
been ~~not~~ "too old to learn"[,] and partly  
to having had wheaten bread all the  
[0021]

6<sup>th</sup> Sheetway from the waggon[^][at Linyanti]. ~~In going North we braved the rains, unless  
they were continuous, and the underlower half of the personthe body was wetted two ^or  
three times every day by crossing streams. But now when we see rain approachinges, we halt,  
light large fires, and each gets up a little grass shed over him. Tropical rains run through  
everything, but though wetted, comparatively little caloric is lost now, to what would be the  
case if a stream of water ran ^for an hour alongoff the body. After being warmed by the fire,  
all go on comfortably again, and the party has been remarkably healthy. In the other journey  
too, wishing to avoid over-loading the men and there by make them lose flesh heat heart, I  
depended chiefly on native food, which is almost pure starch,, ^and the complete change of diet  
must have made me more susceptible of fever. But now by an extemporaneous oven, formed  
by inverting a pot over hot coals & making a fire above it, with fresh bread and coffee in Arab  
fashion I get on most comfortably. TtThere is no tiring of it. I mention itthis because it may  
prove a useful hint to travellers who think they will gain by braving hunger or wet.~~

From the Longitudes[,] I ~~take~~[estimate] the distance

from [top to top of] the ridges to be about 10° of Longitude or 600 geographical miles. I purposely refrain from mentioning any of my own calculations of Lunar observations made because it would appear so presumptuous to allow them to appear on the same page with those of Mr Maclear, who moreover undertakes the labour with such hearty good will,^that I fear to the appearance as of undervaluing his disinterested aid.[N.P.]Tt[T]he Eastern ridge seems to bend in to the West at the part we have crossed[,] and then trends away to the North East thereby approaching the East coast. It is fringed on some parts by ranges of hills[,] but my observations seem to shew they are not of greater altitude than the flats of Linyanti. I cannot hear of a hill on either ridge[,] hence the agricultural phrase I employ. And if it is generally not broader than [0023] 600 miles, instead of calling the continent a basin shaped one, it may be proper to say [that] it has a furrow in the middle[,] with two[an] elevated ridge on each side - [^][each about 200 miles broad] the land sloping on both sides thence to the sea.[N.P>] I have referred to the clayslate or ["]Keel["] formation of which I got a glance in the Western ridge. In the Eastern we have a number of igneous rocks, with gneiss and mica slate, all dipping Westwards, then large rounded masses of granite which appear to change the dip to the Eastward. I bring specimens of both classes of rocks along with me. Is this granite the cause of elevation? [End [...] ]

If your patience is not utterly exhausted by this long disjointed letter I shall refer to but one topic more and then conclude. Tt[T]he ridges are both known to be comparatively salubrious[,] closely resembling in this respect that most healthy of healthy climates[,] the Interior of Southern Africa adjacent to the Desert. the grass is short. Oe[O]ne can walk on it without that high fatiguing lift of the foot[,] necessary among the long tangled herbage of the valley. We saw [0024] neither fountain[,] nor marsh on it[,] and singularly enough we noticed many of the plants and trees which we had observed on the slopes of the Western ridge. In Angola[,] parts - which once were thought to be so unhealthy as to be set apart for the punishment of criminals of the deepest dye, and transportation there deemed much worse than to any part of the coast[,] - are now known to

be the most healthy spots in the country.  
Such are the "Pedras negras" or black  
rocks of Pungo Andongo[,] and other parts.  
[N.P.]If my opinion were of any weight[,]  
I would fain recommend all visitors  
of the Interior of Africa[,] whether for the  
advancement of scientific knowledge  
or for the purposes of trade or benevolence[,]  
to endeavour to ascertain whether the  
elevated salubrious ridges mentioned[,]  
do[are] not exist as sanatoria[prolonged] father  
North than my enquiries extend-[,][and  
whether sanatoria may not be established on them.]  
At present I have the prospect of  
water-carriage up right to the bottom  
of the Eastern ridge. And[If a  
[0025]  
t Sheetquick passage can be effected thither during  
a healthy part of the season[,] there is[,] I  
presume[,] a prospect of residence in  
localities superior to those on the coast.  
Did the [^][Great] Niger expedition turn back when  
near such a desirable position for its  
stricken and prostrate members? [[End]

[P.S>N.P>]-I have said that the hills which fringe the ridge on the East are not of great altitude. ~~Tt~~They are all lower than the crest of the ridges, and bear evident marks of having been subjected to denudation on a grand scale. Many of the ranges shew on their sides, in a magnified way, the exact counterparts of mud banks left by the tides. A coarse sandstone rock which contains banks of shingle and pebbles, but no fossils, often exhibits circular holes, identical with those made by round stones in rapids and waterfalls. ~~Tt~~they are from three3 to four feet broad at the brim, wider internally and six or eight feet deep. ~~Ss~~Some are convenient wells others are filled with earth, but there is no agency now in operation ^in the heights in which they appear which could have formed them. Close to the confluence of the Kafue, there is a forest of silicified trees, many of which are five feet in diameter; and all along the Zambesi to this ^place, where the rock appears fragments of silicified wood abound. I got a piece of palm the pores filled with silica, & the woody parts ofwith oxide of iron. I imagined it was one of the old bottom rocks, because I never could see a fossil in it in the valley; but here (Tette & Naké Rt) I find it overlying beds of coal! If it be not heresy for a mere learner to utter an opinion, I would suggest from the bending in of the ridge, and the appearance of the country Eastwards, that in ancient times this continent presented very much of the same form as the Eastern coast of America does now.

David Livingstone

[0027] [this column  
to be inserted]

Feet	[Temperature of the] Average point of [^][brisk] Ebullition	
3288	Linyanti	205°1/3
4078	Bed of Lekoné R.	204°1/2
4608	Marimbos vil.	203 1/4

	Unguesi R.	202 1/2
5278	Kalomo R <u>Top of Ridge</u>	202°
4210	Naka Chinto on Eastern Slope	204°
3415	Semalembue's on Kafué R.	205 1/2
4078	Top of Hill at Semalembue's	204 1/2
3288	Down at bed of river I hour afterwards	205 3/4
1571	Near confluence of Kafué & Zambesi	209°
1440	confluence of Loangua & Zambesi = Zumbo	209 1/4

[note to  
table in small  
type]the onservations were generally  
made at the same hour of the day  
and when the temperature of the air  
in the shade was about 80°. D.L.