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Volume 4th

Survey of the

Upper São Francisco

by the

Comissão Hydraul^{ca}

1879.

Sunday NOV 23^d I. da Pituba¹

A.M.

I. 105.

10.43 Running between Island and I. B. Channel about 600 ft. wide ^{849 meters deep}. Current 2 miles an hour.

$600 \times 25 = 15,000 \times 176 = 2,640,000$ c. feet per minute, passing down this Channel to day of course a great deal of water is passing down in the other, wider Channel. I cannot see how much.

This channel widens at upper end of island to about 2.50 meters. No cultⁿ on either side here. Island is heavily wooded near upper end.

11.01 Opp. Upper end of I. da Pituba. One immense tree 100 meters below upper end of the Island.

The island is cutting slightly at up. end, current here 2 $\frac{1}{2}$ miles an hour. Some clay, loam mixed with sand. The actual ^{head} is more sandy, and it is being eaten away. We run ^{to the left} across, close to the head.

There are bars, and island-bars, ^{and islands} on R. B. opp. about head of island. Not to be accurately defined. The map is as good as I could make it.

11.05 Looking down the Large R. B. Channel I see the same general appearance as on looking up at the lower end of island; viz Sand bar greenish islands encumbering the Channel.

11.08 Opp. Riacho. (dim) on I. B. uncultivated. The R. B. shore is fringed with uncultivated island bar growth, hiding all that is behind. [Pitubinha, I do not see.] Island a mile ahead; I. da Cabeça.

11.15 Now opp. cultⁿ on R. B. a house or shed ^{and half doz people}.
" " River 2000 ft. wide. (4.4, 4.4, 4 miles)

11.24 = I. 102.

$\frac{1}{2}$ mile ahead, Looking up, both sides of island present clear Channels. The R. B. Channel is ^{up} more than double as wide as the L. B. channel. It looks grand. The other also appears perfect, only so much narrower; but after a grand navigation! 300 ft wide.

11.36 Opp. Lower end of I. da Cabeça. We pass to the R. B. (or wide side) close to pt. of island.

Sunday - Nov. 23^d I^a da Cabeça.

on I. 102.

11.36 opp. lower pt. of Ilha da Cabeça. R.B. Channel 1600 ft. wide - we steer from the lower pt. of Id. toward R.B. Show - oblique. Both shores here wooded.

11.45 A fine clear, splendid view ahead!

12.04 opp. extreme upper end of Sand Spit Head of da Cabeça Island. It is much as the map shows it. - Clear now - 1500 ft. and narrowing some above.

12.22 River 1000 ft. wide. No cult. either side.

12.24 I. 101.

Looking up on both sides of I^a do Rio das Raas, ^{from a third map taken} I see that the L. B. side is embarrased with sand-bars in a manner choked, while the R. B. side is clear. But little water seems to come down L. B. side on the map, it shows only sand on the L. B. side. I have no doubt that in low water it is only sand there now - 25 years after Hafslund's map was made.

12.33 opp. lower pt. of I^a do Rio das Raas.

12.40 In fine clear channel 1000 ft. 12 miles + by our soundings. The current is about $1\frac{1}{2}$ miles an hour. $1000 \times 35 \times 132 = 4,620,000$ cubic feet per minute - which may be within 20 per cent of the actual. That is the actual quantity is not likely to be 20 per cent less. 20 per cent less would make it 3,696,000 c. feet per minute. Neither side of channel is cutting - and probably there has been little change here for 25 years.

12.44 High, clayey-loam banks - 20 ft. above ^{water} the level land looks as if it had been cleared, but it has many bushes and little trees on it. I have observed no sign of cult. on the Island.

Sunday Nov. 23^d I^a Rio das Raas. 13

on I. 101.

12.56 opp. apex of hard cune to left of Islands.

12.58 opp. Fazenda - 8 houses - 3 with Tiles ^{quality} ^{head} ^{of} ^{the} ^{river} ^{is} ^{very} ^{good}. Barra do Riacho das Raas. Cattle and horses on the plain nearby. a nice situation. River - 1500 ft.

There is a large bar on R. B. shore about here much of which is now submerged. It has a green weed, looking growth sticking up above the water. This is shown on map as a bar in front of the "Sangrador do Rio das Raas."

1.09 about opp. (Riacho) no, Sangrador do R. das Raas. The bar on R. B. side continues $\frac{1}{2}$ mile farther up.

1.12 opp. ^{low side} the SAND entrance behind the Ilha Rio das Raas. This is also Head of the Island.

1.19 opp. upper side of same. about $\frac{1}{4}$ mile across - there is just a little water at this stage of the river passing down on the L. B. side. In floods much must be washed through that channel. In low water none runs through here - as the map shows it correctly.

1.20 A magnificent view ahead! 1800 ft. here

1.27 River 1600 ft. much clay in L. B.

1.28 opp. Sang^a on R. B. (I think)

1.29 — I. 100. about.

1.43 River 1000 ft. to large bar along R. B. shore. This bar is more decided than it was in Hafslund's time - partly covered with growth -

lower end
1.45 opp. Fazenda Valka de Cima and good white house and 1 new plantation.

1.49 another lot of 9 houses - several tiled. ^a ^{fine} ^{high} ^{clay} ^{bank}. Red - + white clay.

Rock - cakes - whitish look like limestone show in the new bank - near the water.
1.52 This appearance of Rock continues. opp. another lot of houses. See 10 - there may be more

4) Sunday Nov 23, Fazenda Volta
de Cima
on I. 100

- P.M.
1.57 Opp. the upper house of the place. Rock shows here also - near water. Some iron ore also - and a deep mass of red clay on the top bank - colored with iron.
- 1.59 Opp. point on L. B. at which there is a lot of the iron ore in detached stones, adjoining whitish rock - which may be only argillaceous - but it looks hematitic.

This Volta de Cima - is one of the prettiest places along the river. I mean the situation. The houses, except two or three are like others.

2.00 Beautiful River for a mile ahead!

This red clay formation on top, and whitish clay below, continues a considerable distance up the river. The bank also continues high - ^{esp.} wooded to top. Riv - 1300 ft.

- 2.15 The bar on map, on R. B. shows as shall there a portion of it is, however, submerged.
- 2.19 Opp. a depression in L. B. higher on each side & clearing here - and a house.
- 2.20 I. 99.
- 2.21 Other several houses - 1 new, plastered tiled - Cultivation on top - but woods still prevail. The people look more cultivated too.
- 2.23 Here the peculiar red clay & white clay formation seems to terminate. Above this, the ordinary clayey loam banks rather low and wooded to the edge appear. River 1200 ft wide - Beautiful above. I must get sheet no 8 -

2.30 Low grounds on L. B. (Vasante) cultivated in front of higher ground back. I see the I^a do Estreito $\frac{1}{2}$ mile ahead. The map shows a sanded channel on L. B. side at present it shows water as far up as I can see.

Sunday Nov 23, I^a do Estreito 5
on I. 99.

a large bar on L. B. - for $\frac{1}{4}$ mile below outlet of L. B. island channel. There is a wide water course now on the L. B. side, but my impression is from the general appearance, that it is largely back water. I see the head of a large bar $\frac{1}{2}$ a mile up. Note the head carefully.

- 2.41 Opp. Pt. of I^a do Estreito - 1000 ft. Lower end is cultivated.
- 2.48 A grove of Castor beans, ^{1150 meters long} along near the river bank - with other cult^{ures} behind.
- 2.50 River widens to 1200 ft. There ~~is a name~~ ^{is a name} bar shown on map on R. B. side of island for about $\frac{3}{4}$ mile above the foot. If it is still there it is submerged now.
- 3.00 River 1200 wide - 3 or 4 meters ^{deep} now where we are heading toward, and near to, mid river. Current about $1\frac{1}{2}$ miles an hour.
- 3.02 Opp. a new clearing on R. B. - pretty heavy woods.
- 3.04 River 1400 ft. wide.
- 3.13 Opp. the Shoulder projection of I. do Estreito - where it curves off to the right to its upper point a full ^{three fourths} mile to the right. We run far from it near R. B. side. 80m.
- 3.18 Beg. of low banks on R. B. These low banks are of loam and the river is cutting them away, more castor beans, and ~~some~~ ^{some} cultivation, no body appears. 3.23 Yes, here's a hut or two & two families. Immediately above - no cultivation.
- 3.27 I. 98. ^{Island} Running now nearly parallel with oblique ^{island} ^{Bar 100 m.}
- 3.32 Opp. Upper Point of I^a do Estreito. ^{Bar 100 m.} The water being 6 ft or less above its low stage there is much more water on the L. B. side of island, than on map.
- 3.40 Opp. house about a cove channel on L. B. side.

6) Sunday, Nov 23 - on I. 98 =

- 3.40 Looking back down the L.B. Channel behind the Island Estrito - I see no nothing, but water - but it does not appear like a large volume, at this stage. Probably in low water - no water runs through here. Map shows only sand.
- 3.42 near L.B. (18 to 20 ft) high whitish clay banks small woods comes to edge. nearly vertical.
- 3.52 The red-top clay begins again, very red whitish clay below. This channel has cut itself a little wider than it was in Hatfield's time; but this clay bank comes slowly. Very low small tree but dense little forest to the very edge of the red clay.
- 3.56 So it continues for half a mile up ^{above here.} the river.
- 3.58 opp. here the white clay is very white almost like salt. Dinner Bell.
- 4.15 Opp. upper end High clay banks on L.B. side -

4.20 AS Baneiras ^{a few houses} at a curious offset in the river - and point, projecting up stream.

4.25 River 1200 ft wide ^{very low semi-} to islands on the L.B. side ^{High water then} become islands.

4.25 I. 97.

4.40 The R.B. banks are about 15 ft above ^{water.} present a little cultivation in spots; but ^{mostly} none on river bank slopes - the corn, mandioca, etc, as well as I can see them, look very healthy. The woods have a robust, healthy color, and plenty of foliage. There are little settlements, which were not here in Hatfield's time.

opp. place where R.B. stops cutting. We are heading now to pass out

Sunday, Nov. 23^d - I. 97. 7

- 4.51 Opp. a settlement on R.B. - I see 6 houses, ^{thatched.} at 20 ft. nearly vertical clay bank in front, and wood not far behind, and above and below.
- 4.55 River widens out to 1500 ft. R.B. bank low ^{again.}
- 4.57 I see ^{several} banana trees on R.B. ^{they} look flourishing; and plenty more castor beans. ^{They are on} sandy banks about 15 ft. above river water - The sandy, whitish clayey and brown loamy deposits along the left R.B. - are very important.
- 5.02 We run along 50 meters from R.B. - There is more or less cultivation all along here - River 2000 ft wide. Corn, and castor beans prevail. Shree shows that the river has fallen 1 foot here.
- # A dead crocodile (or alligator) ^{about 5 ft long} floating belly up; looks almost like a man with his arms spread out.
- There seems to be a strip of land about 100 ^{more or less,} meters wide, between the river and the woods - The bank is all the time cutting.

5.17 Opp. where R.B. ceases to cut. We are heading now to pass outside of I. da Parateca

a bar puts out a hundred meters or more from ^{Custom map} just above lower end of the island. It looks like back water behind this island. The channel is probably choked against a low water flow.

5.22 I. 96.

5.23 opp. Lower end of I. da Parateca. ^{on R.B. side} a mile long ^{partly cultivated}

All the land here on R.B. is called "I. da Barra"

5.29 Now over at the I.B. side. 40 meters from shore Concave - Channel on this side - ^{10 ft deep -} 1200 ft. wide Banks 12 to 14 ft. do not cut badly - gentle curve. more clayey than the R.B.

Give Looking River for a league above.

5.39 Opp. Upper end of I. da Parateca.

There is along bar ^{on this side of the island,} this side of the island, both above and below the bar - near it. 1200 ft. from here Behind the up. end of island there is a stream, and Ponta da Parateca, ^{a few houses,} very much sand bars in sight in them.

8] Sunday. NW 23^d I^a da Barra da Ypoeira

5.45 The Ilha da Barra da Ypoeira begins about 400 meters above the upper end of I^a da Parateca

There are low sloping sand bars facing the lower part of the island Barra da Ypoeira

5.53 a little clearing on L. B. side - Bananas. [we are in the shadow of the woods and can feel the cool of the evening, quite sensibly. It is not unpleasant; see Comment -]

5.58 Cultivation along here, with good dark soil - redeemed from woods about the highest floods. -

6.00 Stop - anchor - at Barra da Ypoeira, not very far below ^{1/2 mile perhaps} opp. head of Island.

Stop all night. Barra da Ypoeira.

We have run 12 leagues to day, without a stop - about a league an hour, is what the steamer does when she can keep going, regularly.

REPORT.

The navigation excellent, all the way.

The Country improving in agricultural capabilities - every league.

Population has not been so dense here as it was some days back; but here, if this wood land is rich, there is room for more workers. - more settlers.

The people appear to be of a better class. However, this is Sunday - and many have their best to day.

Monday - NW 24th Barra da Ypoeira 9

a.m. I. 96 Stitching

6.00 Start fairly - High bank - 2^d bank -

6.02 opp. large plastered house - on 2^d bank

6.06 " more house - high handsome bank (Clay)

We head on further Island Shore - obliquely 40 ft. plastered on high bank, n

6.12 opp. - another large house plastered between us and L.B.

6.17 opp. a lot of 8 houses - good, fair houses. Inj. above the upper part of Barra da Ypoeira - We stopped at the lower end of the village.

6.26 We run near (30 meters) of Island. Cultivation on island side.

* Opp. Upper end of I^a da Barra da Ypoeira. The map shows only Sand behind, (at lower)

* The upper end of this island is now merged with the R.B. - so as to be indistinguishable - it is no island.

6.26 I. 95 = about here.

* River 1800 ft. There seems to be about the same thing in the case of the little unnamed island on the L.B.

6.38 Sandy bank on R.B. Cutting. Riv. 2200 ft.

6.43 River 2500 ft. wide. Looks like rocks at river on L.B.

6.47 an oblique away from R.B. The island "Las Pedras" appears to have merged into main land - "L.B."

6.55 opp. lower pt. of (new) green island on R.B. side. It was a sand bar in Hatfield's time.

Sand bars, and sand bar islands, characteristic the R.B. side of the river - along about here.

7.00 River only 1200 ft. wide from L.B. to sand bar. We are running at mid-channel ^{approach of L.B.} 6.5.6.6.

7.05 75 m. from L.B. sandy - clayey bank, 10 ft. a. cut; we immediately oblique to left, toward Sand bar.

7.10 "Coroa da Boa Vista" - marked on Map

Somewhere along here. There is a very pretty sand bar here on our left as we oblique toward it.

7.13 with 3 huts - "water shelter" - Fishermen - It is a beautiful place for Seine fishing!

7.15 I. 94 = about here.

7.16 We oblique to right, toward L.B.

7.25 about 100 meters from L.B. shore - sandy clayey banks 12 ft. or Sand bar islands and semi islands continue on R.B.

10] Monday - Nov. 24, J. 94.

- 7.30 We oblique to left toward the R.B. sand bar island.
 [There is no appearance at this stage of the ring of clay bar on the L.B. side for a league along here - which accords with the Map.] 7.35 L.B. 18 1/2 ab. riv. R.
 7.37 Within 150 meters of R.B. sand bar isle - swing toward Middle
 7.44 About opp. upper end of (MAP) "Córrea da Boa Vista"; - but bars now visible 1/2 mile farther up, to a point on R.B. submerged at this stage, except some grass sticking up.
 7.45 Heading obliquely toward L.B. RW - 1200 ft.
 7.55 Opp. lower point of very large sand bar island. Going up L.B. channel. 800+ ft. wide.

The river has been revolutionized along here. The river has cut out a deep channel (10m) on the R.B. side. Partly from the main and partly from the da bar (of the Map) - The

The river seems to have fallen 2 ft. below where it has. The river has also scolloped a deep concave on the R.B. side, and the large bar in front of the Tres Ilhas (on L.B.) has worked over toward the receding R.B.

- 8.04 Opp. Tres Ilhas. High clay bank 30 ft. to 35 ft. one old house visible - but there are several ^{new} huts on the Sand Bar island. 2 squat, female appar.

Some ferruginous clay at foot of bk. river edge. Almost a rock formation - some red clay in top.

- 8.06 Opp. where the bank falls off to 12 ft. height. ab. ^{Ilhas} Tres. River now 1200 ft. to sand bar island.

Woods - [no appearance of cultivation now] Paralleling L.B. - 30 to 40 m. out.

- 8.18 Obliquing to left, parallel with sand bar island

8.18 L. 93 - about

- 8.27 Opp. lower end of new sand bar between us and L.B. has some green bushes in it. It lies off about a hundred meters from L.B. It is half a mile long. 8.34 opp. upper end of this new bar.

- 8.28 In mid river - I see up river - nearly a quite 3 leagues - from the appearance of the water.

There is actually a water horizon in one place, on the ^{upper} westerly side of the distant river. The map shows straight river abt. 3 leagues.

VIEW

Monday, Nov. 24, on L. 93. 11

on long straight part of River.

- 8.40 opp. Barreira Branca de baixo - of Map. [Supposed] River 1200 ft.

- 8.43 Opp. high 25 ft. ^{clay} bluffs on L.B. woods to edge.
 8.47 new Red clay on top - white clay below. "House" ^{no one} ^{approx} Red clay bank 35 ft. above front water.

I think this is Barreira Branca - of Map. White clay runs to top - little way above house

- 8.50 Opp. a calcareous looking place in bank - the clay white clay is now topped out with a cream colored which continues for 200 meters - bank 30 feet high

- 8.57 Opp. lower end of Esprito Santo. a number of people on the high bank (30 ft.) ^{many goats}

- 8.58 opp. GRAND HOUSE. ^{a 100 ft.} stands back.

This is the most stylish home I have yet seen. ornamented - with yellow and white. ^{within 50 meters} ^{of the shore.} The banks are so that we can't see the houses.

- 9.02 White clay at water edge - and some ferruginous ^{stuff.}

- 9.05 opp. - a good house - [many people -]

- 9.06 opp. another GRAND-HOUSE, with a large wooden crib in front 100 ft. ^{from it} ^{very pretty}

- 9.07 opp. Point 30 ft. high - with Rocks or large stones strewn on the steep slope. Yellow clay top.

- 9.10 Breakfast Bell.

L. 92.



- 9.27 opp. lower end small island to our left } ^{River} }
 9.31 " upper end " " " " " } 1400 ft }

The Ilha dos Angicos seems to have departed.

- 9.40 The high clay banks and occasional rocky Colas continue - color - red, white, yellow, brown. nice sand bar on R.B. in run on L.B.

River - 1000 ft. here - 9.9.9 - 50m for shore. 12,9 more ferruginous stone taking foot of high clay bank.

- 9.49 Opp. Angicos - on a clay point 35 ft. a. This water. Can't see the houses, clearly - Map shows 9.55 ^{upper end}. ^{a decaying aspect.} I see a few houses. Buraco do Inferno on R.B. ^{side of River} ^{can't see it} ^{for miles}

12] Monday - Nov 24 I. 92.

9.55 Opp. end of high clay bank - low banks above here
Some of the low ground is cultivated.

[Angicos has a fine situation - but it has
not grown any in 25 years.] River 1200 ft.

10.05 "Vasante" opp. on R.B. side. Sandy.

10.10 I. 91. - about -

10.12 The L.B. side. Woods about 20ft ^{bank clay - Coam} ab. low water.

10.28 Opp. ROCA - on I. B. ^{of no account. Same} ^{2.5 hours! 25 years ago.}
Rocks on a rounding point - 20ft. above low water.

We oblique toward R.B. 10.30 Paralleling R.B. ^{40 meters}

Beautiful River! - straight up 4 miles!

River 1200 ft. normal banks

10.50 Obliquing toward L.B. Both shores Woods

11.05 Opp. OS MARI'S. ^{mid river} 6 hours - 2 Feb 200 ft. ^{normal banks}
Same number 25 years ago.

11.05 This is a pleasant looking place - high
sloping, green banks & pretty trees. It has
a home-like aspect. River 1200 ft.

11.05 = I. 90. =

The bar 1/2 mile below Os Mari's - has disap-
peared - a little green tuft of the larger
bar opp. Os Mari's - is all that is visible of
this larger bar.

11.10 now within 40 meters of L.B. shore. deep. ^{6+7m}

11.27 Large bar - ^{low end} top of it above present water
on R.B. shore - It seems to extend up nearly
or quite a mile. Caution Pilot shows the boat ^{2+4m}
bar.

11.38 Opp. a little clearing in the woods R.B. side ^{boat} ^{boat} ^{boat}

11.45 [Buraco do Taura (on map) not visible on land.
unless it is one hour back and 1/2 mile - on L.B.]

Opp. a small new clearing on R.B.

11.45 I have another water hole on -
at least 8 miles up River - It is better than the
one of this morning.

Monday NOV 24 - on I. 90.

13

This ^{long} water river is much wider and more
clear of projecting points than the maps
shows.

The very large bar shown on map on the L.B.
is not visible - though at low water it may be
visible. I see no sign of it in the surface but
the water is very turbid, and it might easily
be there.

12.00 Near I. B. show - 4-4-4 1/2 - River 1600 ft.

12.05 I. 89.

12.10 The Pilot steers again across river - on account of a
submerged bar - just above us - The lowest sound-
ing we found in crossing was 3 meters.

12.19 on R.B. side, 40 meters off - 4-4-4 1/2 m. ^{River 2000 ft.}
Sandy banks 12 ft high, clothed with small trees -
a large bar opp. here in mid river - with a
thin layer of water over it to day -

12.29 River 3000 ft. wide
Rocks on shore L.B. are shown on Maps opp. the old
map) head of the island da Cachoeira - which
has disappeared.

12.33 Opp. one hour, on L.B. 1/2 mile below the Rocks ^{rocks} ^{apparently}

12.36 Opp. appearance of rocks on L.B. show 2500 ft. off.

12.40 Opp. a pretty place ^{this is below RIACHO!} on R.B. on the apex of
a sweeping Caixa Curve - pretty banks there
I see a house ^{or hut} and a dozen people. ^{houses}

12.50 I call this - RIACHO though Maps show 2-1

It has three huts. ^{a little boat}
[nearly opp. ^{a little boat} on L.B. side is a small point of
rocks at water edge.]

a beautiful River!

12.55 River - 1800 ft. It widens above -

[a fine range ^{distant} of blue Serra ^{say} 3 leagues to left.]

12.59 Opp. Rocks on L.B. show - 80 meters to right.

"Cachoeira" of Maps

1.00 somewhere along here - said to be the place of Cal-
Carcas Rocks - and the Fazenda da Ponta
da Ilha da Cachoeira (which is gone) but I could
see neither house nor people.

14] Monday, Nov. 24, I. 88.

1.05 I. 88. - on league below Carunhanha.

1.15 Near R. B. side - 4 little plantations in sight along here - on top of the bank 20 feet above the river - a nice looking piece of ground. Run 2000 ft - and opp. a bar on R. B. side.

1.30 Opp. lower point of I^a da Carunhanha. We run now for the town

1.40 I. 87. or about below, lower end of town

1.45 Arrive - tho' it was 1.47 when anchored.

CARUNHANHA

slate - for exportation - found near here.

Handsomely situated, on an elevated plateau - 40 to 50 feet above the river.

The population, or a large number - live on the high banks, and lower sandy banks of the clay banks.

The channel on to the island is 1000 ft - or perhaps 300 meters - and deep - 5 meters near shore.

Sr. Amarante negotiated an arrangement for obtaining 4000 sticks of wood at 8% for M - to be ready to move. It depended partly on getting a barca to bring the wood up from league below.

On viewing of the three or four barcas here - could not get one to go - had to arrange to bring it up in canoes - and for an mule to get some elsewhere.

[Wrote a long letter to Sr. Plinio - 25th]

Evening of 24th (see 250.)
Went through the town - many houses, a tumble-down church - no spare of glass, town a miserable looking lot of the hundred fifty or more buildings - half a dozen - tolerably respectable looking houses. No Sobrado. Population the same - as other population of the other towns. 1180 poor, + 20 well off - for a guess

"Hydraulic Commodity" on board, 5" P. Dant as
M^{rs} Exp. dar Carunhanha Nov 25, 179
Sr. Com. Sr. Sr. Plinio d'Almeida
Secretaria do Ministerio de

Certo. Ur amio
have yesterday afternoon, and our wood being exhausted we remain here to lay in a fresh stock.

I have to report a good navigation all the way from Uruibé to this place. At Uruibé I inquired about the mails and learned that no mail would leave there for Bahia for eight or nine days, and that it sometimes takes a month to reach Bahia, I therefore concluded to bring my letters to this place, hoping there might be a quicker communication. Here they say it takes from 25 to 30 days to Bahia, and a mail goes in three days. I therefore mail here.

Referring to my preceding letters I have to add, that the Oroya continues to improve as we advance.

Here, and for some distance below, along the river, there are lands cultivated, to a limited extent, ^{that is} above the level of the highest floods; land, ~~which~~ ^{that} has been cleared in the woods, and which is very fertile.

The woods are now often dead forests, such as are not seen any where along the lower part of the valley; and this region seems to have been favored with more moisture. The kind of cultivation, in much the same all along the river, ~~except~~ it is all consumed in the valley as it will not at present pay to ship it to the coast.

The towns also are ^{nearly} ~~of~~ the same general character. Lapa is the most interesting place we have ^{yet} ~~seen~~ visited; on account of the grand and very peculiar limestone rock mountain,

16] And on account of ^{peculiar} religious associa-
 tions, concerning which you know much
 more than I do. All the members of our
 Commission, Prof. Darby, and our Comma-
 and the officers and hands from the steamer
 visited and inspected the remarkable
 Cava Church which was established two-
 hundred years ago. The Priest happened
 to be away, so that there was no public
 service. ^{Officials to receive officers - grades of monks etc.}
 our canoe ^{was} ^{from} ^{the} ^{water} ^{that} ^{drops}
^{into} ^{the} ^{water} ^{that} ^{drops}
 place than I expected to see, and I was
 surprised to learn that there is no mail
 agency there. The Commandante told
 me that there were seven hundred houses;
 a great many ^{are} ^{at} ^{present} ^{unoccupied}.
 I thought that there were several hundred
 houses; but I did not suppose that there
 were so many as seven hundred. He said
 that the population at this time is only 1500 -
 that many had gone away some time ago,
 on account of some trouble; but that they were
 now returning.

The "rock" is about half a mile long, nearly
 three hundred feet high, and with a base
 a ^{good} ^{deal} ^{more} ^{than} ^{eighteen} ^{hundred} ^{feet} ^{broad}, in the
 mass of limestone formation I have
 ever met with; its forms of pyramidal,
 Church or gran columns, with their very
 remarkable steel-gray color, are perfectly
 beautiful. It is indeed ^{time} ^{well} ^{repay} ^{much} ^{labor} ^{to} ^{visit} ^{it}.

Prof. Darby and Sr. Sampaia climbed to
 the top and had a splendid view for many
 miles in every direction. ^{Dr. Sampaia has made a}
 number of interesting sketches. ^{He is} ^{using} ^{photographic} ^{machines}.
 There have been
 numerous changes in the bars, islands
 and main shores since Halsted's time,
 caused by the action of the river cutting away
 in certain places and filling up in others;
 but these changes do not ^{really} affect the
 navigation. ^{They} ^{merely} ^{change} ^{the}
 position of the channels. Always, ⁱⁿ ^{any}
 place, ^{there} ^{is} ^a ^{navigable} ^{channel}. ^{It}

only needs a pilot who is acquainted with
 the river. He can readily note the changes.
 Our pilot has not been up the river for
 three years, yet in navigating 157 leagues he
 has only missed the Channel once (when the
 sun was shining directly ^{or} ^{west} ^{of} ^{the} ^{entrance}
 from the water) and that was caused by false informa-
 tion from a pilot in Riqueaques.

I infer that they ^{are} ^{of} ^{the} ^{navigation}
 to Pirapira; but I speak positively only of the
^{part} ^{of} ^{the} ^{river} ^{that} ^{is} ^{open} ^{to} ^{navigation}.
 From the Villa da Barra Grande to the
 Villa Caranhaha, has taken 13 days,
 including all stops; which is at the rate
 of 6 1/3 leagues a day. It is 31 leagues ^{from}
 here to Larmania. Sailing here, ^{tomorrow}
 I ^{think} ^{will} ^{reach} ^{there} ^{on} ^{or} ^{about}
 December 1st here.

*The climate is charming. It seems
 to me that persons taking reasonable care
 of themselves might live here to a great age;
 but the majority do not take such care
 of any care of themselves, in any particular.

Before leaving the United States,
 my Life Insurance Company - in which I
 have been insured about 30 years, insisted
 on charging me one per cent on account
 of going to the San Francisco river. I have
 written to the President of the Company pro-
 posing to charge them 5 per cent. ^{of} ^{the} ^{policy}.
 of the renewed faith that the San Francisco
 River will bring me. ^I ^{am} ^{quite} ^{sure} ^{more} ^{and} ^{more}
^{convinced} ^{at} ^{the} ^{equality} ^{of} ^{the} ^{eff}.

I am going to Pirapira, if I can.
 hope we can get the steamer to go.
 All unite in kind regards to yourself
 and our friends in Rio de Janeiro.

The Rio Grande is a noble
 stream, furnishing at the time of our
 measurements, about one sixth of the volume
 of the San Francisco below its mouth. The
 Correntes is also a fine river; and so is the
 Caranhaha.

I have the honor to remain
 with the highest respect
 your Ex^t Obedient
 Servant
 W. Miller
 and on check

* Emergence 40 to 50 - wide, deep
 Channel 1000 ft wide to island
 dipositional. River - no grass - yet it
 is said to be a place of business.

18] There is a rumor here that the other little steamer is preparing to come down the river. She is said to be inferior to this one, both in size and power. If that is correct, they can make more money by burning tar up, than they can by burning wood on her and running her. Such steamers as these, on this river, cannot be profitably run, where it always find class canoe men can be had for a ^{small} price per day from 20% to 25% - per day will pay the total cost (including interest and renewal) of a first class barca, carrying ^{about} 30 tons, whereas the interest, alone, of a steamer - putting its cost, on the river, at 50:000 \$ 000 is 96% 000 per day and the cost per day of running it would be more than twice the cost of running the barca; and the steamer would make little if any better time, in the long run. Now, then, could such steamers compete with the barcas or how could they benefit the valley?

It is quite obvious that in order to improve the transportation facilities of this fine navigation, more powerful and swifter steamers, capable of towing two or three barges (two, five, or more tons each, are indispensable). At present this subject is much glanced at, but it is sound, as far as it goes. I had a barca that is in port measured this morning - the "Estrela Brilhante" - which trades between Januaria and Joazeiro.

She is 20.18 long (66 ft) ^{4.30} wide (14 ft) with a draught of about 0.77 (2 1/2 ft) when loaded; her cargo 14,000 rapadoiras, (4 lbs each) = 56,000 lbs. or 28 tons (2000 lbs each). These barcas are now getting made of boats; with but little change in the shape, they will make good barges for towing. In fact such barcas, as the "Estrela Brilhante" will make good barges for towing. I have known many, but it would be better to buy higher about the water, so that they will not so easily...

Col. O.C. James Caranhaha Nov 25/19
Rio de Janeiro

My dear Col.: [A long letter, giving an account of the Lapa Church and the grand limestone Mt. Mountain, with the general account of the river and country and the towns, and a slight touch of the dog - my theology.]

I sent letter also - written farther down the river, to Cousin Pop Van Sew; and two letters to add; one of them containing separate letters to our darlings. Two letters to Sr. Plinio. Copy gone in Vol. 3. Copy of the other in the preceding pages.



Barca (including boiler, plank, 3 masts, 10 draught light, 2 1/2 ft. load, cargo 50,000 lbs. = 28 tons. Built at Januaria. Said to be (by Juvenio - "Machinista") the largest barca on the river; but I think that the new barca that I saw in Joazeiro, was (is) larger - as long, or longer, and deeper - and nearly as wide - not quite.

Measurement of Caranhaha River - Nov 25
The water is clear but a dark greenish brown color - a great contrast to the muddy
60m above mouth = 197 feet
width 89m = 292 ft.
depth 3 to 4m as say 3 1/2 = at 71 1/2 ft.
area 273 m²
Volume 156 c.m = 5579 = 331,140 per minute
Vel. 0.57 ft per sec = 34.2 per minute
1.28 mile an hour

Write a very long letter to Comelheiro A.P. de Carvalho Borges, Minister Plenipotentiary, to the U. States. Nov 26. Mailed letter in Caranhaha Nov 26.

more barcas on river
 which can be used
 more barcas on river
 which can be used

80 x 12 x 5 1/2 ft
 draw 10m feet
 and they are made of boats

Copy of C. James
 Copy of C. James
 Copy of C. James
 letters in Caranhaha Nov 26.

20] Carunhanha - Still - Wed. 26

Half a league above this town is the mouth of the Carunhanha River, which we measured yesterday [see page 9]

This now is the boundary between the Provinces of Bahia and Minas

(rather below)
Opposite the mouth of the river on the right bank of the S. Francisco river, is N. S. de Rozario da Malhada in the Province of Bahia.

There is the Custom House - Provincial, for collecting the tax on the Commerce passing between the two provinces.

The collector says the amt. is about 100\$ per month (= 1200\$ per year ^{at that rate}) His pay is 700\$ per annum and he has a soldier whose pay and fringe would probably eat up the residue. The amount that could get to the government would be infinitesimal.

But he says he has only been there since June, and he knows nothing about the collections of his predecessors.

He says that since the trouble in Iamania there have been no receipts.

[It strikes me that it is a mistake to have any such impost between two adjoining provinces; or between any two provinces, or in any province.

It is a tax upon the producer, or against him.

The collector says the tax is 3\$920 per Cargo of 6 arrobas = 653 reis per arroba.

This barca Estrella Brilhante now in port, carries 14,000 rapaduras ^{4lb} = 56,000 = 1437 arrobas - According to the above the tax on her load would be 988\$36

Start 1.38 P.M. to go down River to the woods. ^{Some error here!} See Mr. Necker

Wed. Nov. 26. In and below Carunhanha ^{Wooding} 21

Engenheiro Halford says that the Barra do Rio Carunhanha is 2056 paces most of all = feet, above the sea.

420 Paces = 294 feet wide at the mouth
336 " = 235 feet wide 1/2 league up.
13 " = 9 1/2 feet deep
2.125 " = 1.8 feet Velocity per second
7354.20 " Cubics =

Half made Imports

1088 ar. de faz. ^a	@ 200%	217:600\$
80 " " for. e ferro "	10%	800\$
60 bar. " Vin. e Vmagra	18%	1:080\$
25000 broc. de Sal	5%	125:000\$
273 ar. " fumo "	5%	1:365\$
		<u>345:845\$</u>

Exports

8672 Cabecas ^{de gado vaccon}	@ 14\$	121:408\$
1239 Animas cavalares ^{e muros}	30\$	37:170\$
6996 Alqueires marea ^{em milho}	2\$	13:992\$
422310 Rapaduras ^{4lb cada}	.160*	19:569\$600
3200 Alg. de Feijão	3\$200	10:240\$
507 ar. de assuc.	4\$000	2:028\$
920 " - Favechão	5\$	4:600\$
324 Alg. de Arroz	2\$	648\$
81 Mais Solas	2\$500	202\$500
357 Couros crús	4\$	1:428\$
57 duz. de taboas	12\$	684\$
125 bar. agua ardente ^{o m. armelada}	4\$	500\$
121 ar. gorobada e	2\$560	309\$760

345:845\$000
212:779\$860

Difference in Value. 133:065\$140

* The rapaduras (4lb) are now worth 200 reis or more Nov. 1879
For the town of Carunhanha - Halford gives
265 Casas & 1,200 habitantes.
61 to 65 palms (1) ab. River.
For Malhada - 50 to 60 Casas - 250 habitantes

22) Thur. Nov 27th Carunhanha. I. 87-88.

Yesterday afternoon we had to go down the river nearly a league, to where our wood was brought to the bank - and by the time we had it on board it was past 5 o'clock, and I decided that it was better to remain till morning rather than to return to the town, where we had no further business.

So we have to lose one league of our running time - run it out again this morning. Water fell here

5.45 Start - near lower end of I. 88.

6.30 ^{8.15} opp. Lower end of Carunhanha.

6.33 opp. Lower point of eminence on which ^{the town stands}

6.36 opp. ^(washed in clay) Ranho, in lower part of town.

6.39 opp. principal landing ^(also a washed ranho) of town.

6.41 opp. the best house (stone) of the town. ^(also a ranho)

6.45 opp. upper end of CARUNHANHA.

The line of demarcation between the clear water of the tributary and the muddy water of the S. Francisco is quite distinct - about 100 ft. above - from the shore.

The land above the town, is flat - not more than 15 ft. ^{15 ft.} above present water - which may be about a metro above low water.

6.54 opp. upper end of I. da Carunhanha. It has a long extending above.

6.58 opp. upper end of said long bar. We are now inclining away from I. B.

23) Thur. Nov 27th I. 87. MALHADA.

7.02 opp. Torno - on I. B.

Approaching N. S. do Rozario da Malhada - which is on R. B. a little way below opp. mouth of River Carunhanha.

Since the 25th inst. the water has fallen abt 1 meter.

7.15 opp. lower end of Torno.

7.18 opp. Town - we stop - went into Torno

We met Sr. Collector Moro - brother of the Minista of Marine. MALHADA

Torno has a hundred or more houses, a miserable apology for a church, no good house - we met one very nice Cushing gentlemanly merchant. His wife is the brightest most intelligent looking lady I have seen in the valley.

This is the port where all barcas passing from one province to the other pay their provincial taxes.

I saw the Collector's book - showing 13 Collections since June - one of 798,000 another of 508,000 or so, the others for 4 to 10K - the whole would not amount to 200,000

The Collector says it is in account of the war in Jannaria - that no boats are running, etc.

Sr. Amarante has now in his book a mem. of the printed rates of charges -

24) Thur. Nov. 27th I. 87.

8.45 Start - from MAIHA DA
opp. mouth of Caranhaha River - ^{meters at mouth.} arr 100
(294ft 200ft up) 1 hour on Bahia side ^{1000ft}
8.51 no house on MINAS side
Beautiful contrast - blue & yellow water

Now we run with Minas
on Left bank, and Bahia
on Right bank of River.

9.10 I. 86.

Instead of using I. B. I will
use Minas, for I. B., till we get
up to Minas on both sides.

Breakfast.

9.20 On clear river - our course rather
on the Minas side.
The map shows heavy bars ^(coroa do escuru) on Bahia side
for 2 miles above lower end of I. 86.
The Pilot runs a 100 meters from shore, as
though it were about nearer; the soundings

9.35 Engineer stops boat (permission given) he said
for two minutes. - he stopped even slightly less.
9.37 Under way, again.
The soundings have been $2\frac{1}{2}$ to 3 meters
The river is 2000 ft wide.
I see no appearance of bars on Bahia
side. It would be better if they were there.

9.40 Half a mile above, I see a large bar on the
Bahia side. Wood is here, both sides.
Some soundings only 2 meters.
Normal banks, with tolerably steep slopes
and trees and over the edge of cultivation

Thur. Nov. 27th I. 86. 25

There may be cultivation - back, on Minas side.
9.46 We are now only $\frac{1}{8}$ mile below the visible
part of the bar on Bahia side - and
our soundings increase from 2 to 5
meters - and continue 5 or more 10.
9.49 Opp. Lower (visible) part of bar on Bahia side
but nearer 60 meters from Minas shore.
Between bar and Minas shore 1000 ft. at
lower end and 1300 ft. at upper end.

9.55 $6\frac{3}{4}$ $6\frac{3}{4}$ $6\frac{3}{4}$ (40 meters out). Here we begin to
oblique toward Bahia side - soon turn up -
then oblique again. Pilot steers as tho there
is a bar on Minas side above - and to pass
above the Bahia bar. We pass quite obliquely.

10.00 opp. upper (visible) end of sand bar on Bahia side
now within 600 ft. of said bar
I perceive signs - in the shape of a large sub-
merged bar off toward the Minas side
This feature down stream than the bar on the
map - which begins at lower end of I. 85.

We are in fact following the old map
channel, as nearly as may be.
10.06 - at 150 meters from Bahia - $2\frac{1}{2}$ 2 2 3 $3\frac{1}{2}$ 4

The verdure, along the Bahia shore, is beautiful;
rich, deep, healthy looking shades of green - cob-
bashed with lighter greens I. 85.

10.15 Opp. lower end of visible sand bar on the
Minas shore - 1500 ft. off - River 2000 ft. total.
4-4-4-4-4
10.18 opp. another visible sand bar this way from the other
not over 900 ft. from Bahia - brings soundings to 7-7.

10.19 40 meters from Bahia - 7. These bars on the
Minas side in low water doubtless form one
bar with tongues of water. As a whole it is an
immense bar - 8-8- and it makes a fine

10.22 channel on the Bahia side. 8 - (30' out.)
Pretty cultivation on slopes - gentle - Minas side,
corn, and cane. It all has a healthy aspect. Ah!
See that this cultivation is on an Island
a very pretty island. It is marked as quite
insignificant on the map. It has a green since
it is called I. da Ypoeira. (6-6)

10.29 The dis. to the bar is now increasing. The
bar inclines obliquely to the Minas side
 $\frac{1}{4}$ mile above Island.
10.34 Opp. up. pt. of I. 85. (10.44 Opp. up. pt. of bar - nearly up opp.
end of bar.)

26 Thur. Nov. 27. - League 85.

between Minas + Bahia

10.32 The water has fallen here, within a few days, $\frac{1}{2}$ meter, judging, from the recent water lines on the bank.

10.37 Here, where the river has widened to 1500 ft to the bar - it is not over $\frac{1}{4}$ miles - River is still widening.

10.38 - An oblique away from Bahia shore.

10.44 Word from the Machinista - must stop -

4^{min} machinery too hot. Stop - 150^m fr. Bahia. (nearly) up to upper end of bar on Minas side

10.48 Start - again.

Now the bar puts out from Bahia, and we oblique toward Minas; though these two great bars do not now overlap so much as on map.

10.50 Opp. upper end of Bar on Minas side

In fact

11.03 Near the Minas Shore. (40 miles out) Beautiful ^{beach} here.

11.09 opp. lower end of Island (unnamed on MAP) marked "Pedra" at lower end.

There is now, first a little island, then water, then the larger island - then water, then a tiny Id.

11.09. L. 84. Handsome view, up river. ^{2 League up river}

11.19 - about opp. where upper end of the island might be, but it merges into the island Anguseira.

We run close to the tiny island and over to the shore of the Ilha Anguseira (30 mi) River from island - 1800 ft. to Minas Shore.

11.27 River narrows above here. $4\frac{1}{2}$ $4\frac{1}{2}$ $4\frac{1}{2}$ $4\frac{1}{2}$

The natural vegetation! very much greater than along the lower part of the river.

11.30 oblique away from Id. Anguseira -

11.33 Opp. a level tree, on the shoulder of island, where the head of the island inclines off toward Bahia side - leaving a clear water channel between that and another island, or bar with much growth on it. Opp. Estreito - Bahia side.

11.35 Opp. lower pt. of said island bar. River here

11.42 Opp. upper end of said island bar. 1000 ft.

THUR. NOV 27. II. 84. 27

all this part of river on Bahia side is Sand Bar partly submerged, but visible in many places.

11.47 Approaching visible bar - which narrows river to 600 feet - 6, $6\frac{1}{2}$, $6\frac{1}{2}$, 7. (60 meters from)

11.50 60 miles from Minas - 7-7-7-

Stiff clay bank. It grows deep near shore

11.57 Immense bar on Bahia side - 600 ft. left 7-7-7-7.

P.S. Much water must go down the other channel on the Bahia side

11.54 Now the bar ⁷⁻⁷⁻⁷⁻ evidences away, leaving wide channel on Minas Side

I perceive that there is a wide channel on the Bahia side of the large bar.

11.55 Say - L. 83

12.00 Opp. Upper end of ^{large} Bar on Bahia side.

12.05 Obliquing toward Bahia side.

Somewhere along here is opp. the lower end of the High Water Island da Cachoeira but the tree growth is so dense on Minas side as to hide the place.

12.15 Opp. lower end of bar toward Minas side; it is a little lower down than the bar shown on the map.

12.19 Opp. lower end of Cachoeira - on Bahia side ^{5.5 $\frac{1}{2}$ 5 $\frac{1}{2}$}

not much more than dead bushes growing from the rocks now visible. The upper portion shows a stop covering of sand, hiding all the rocks.

12.27 Opp. where this sand covering begins.

[Halsted - says "Quartzite?"]

The town or village or hamlet of Cachoeira is strung all along here for a mile.

There is a deep channel ^{4.5 miles wide} of ample width between this bar and the Minas shore.

In connection with steamboating, this Cachoeira - is of no consequence. There is no occasion for boats to run near these rocks, unless they have to land at Cachoeira.

12.29 Opp. upper end of the rocks or sand bar

28] Thur. Nov. 27. I^a da Cachoeira

12.35 nice bank on Bahia side, ^{20%} I. 83.
House dotted all along here - back.

" " about opp. the old (map) upper end of
I^a da Cachoeira - with sand behind.

It is now merged into the land, so
that it cannot be distinguished; but
there is a high-water-sand-bar island,
cut off from the head of it. See map.

12.43 opp. Sangrador, on Bahia side.
Pretty gravelly looking beach along here.

Sargassos on Minas side of River.
Recent water lines from 1 foot to 1 mile - show plainly.

12.45 Oblique toward mid-river.

12.50 I. 82.

12.55 opp. about upper end of visible bar Minas side
Here the river ^{above} appears clear for $\frac{1}{2}$ a mile.

1.03 opp. Sangrador - do Pão Preto - Bahia side

1.07 opp. Point - Bahia side - marked on
map. "Mato Grosso"
There are two very large trees in sight,
perhaps it is named from them.

1.10 A Bar begins on the Minas side of river, opp.
and extends upward.

1.12 opp. Fishing place - large net seen.
a barca, here, heading up - tied up - temporarily.
Probably bound down - a beautiful beach for
draining in a series. High bank - 25 ft. (above),
and cultivation on top. much clay in bank.

1.17 opp. some argillaceous rocks at edge of water.
They may be merely indurated clay. Bahia
now heading toward mid-river from Bahia

1.22 opp. Rocks (submerged) nearly 200 miles from
Bahia side. They are shown on map, a bar

Thur. Nov. 27. = I. 82 ROCKS.

on the Minas side - seems to guide the
Pilot nearer to these rocks than the old
map channel shows.

These rocks are much more dangerous
than the Cachoeira rocks we passed this
morning; - because they are far out
and hidden when there is a little wind.

I would run here missing the sand bar
on the Minas side, rather than these
rocks - in a 3 meter packet, and above
that, they are not in the way.

12.28 We are ^{now} above - clear of the rocks.
The map again says "Mato Grosso"
this time on the Minas side. It is not
a very high woods; but the foliage is very
dense and very beautiful.

1.34 ledge of ferruginous rocks ^{on map "Recife"} at the Bahia shore.
The now 2000 ft.

The considerable bar on the
map, beginning just above the "Recife", is
not visible. If true, it is submerged. A
quarter of a mile farther up, some drift limbs
show that there is a bar, submerged.

1.40 However, I see "Recife" at several distinct
points - one opp. here, and that may be the
one on the map. River - 2500 ft.

1.45 I. 81.

1.50 opp. Ferruginous rocks on Bahia side

1.52 As Melancras - on Bahia side
consisting of seven or eight - houses - scattered
along the bank for $\frac{1}{2}$ a mile - one new, with tile roof.
Beautiful mass of foliage along river on Minas side.

1.55 Map says rocks between here (mid-river) and
the Bahia shore. They are submerged, and could
not be noticed if there was a little breeze on
the water. Marked "Recife" on map.

These rocks are dangerous in this stage
of the river and when it is lower. When it is 2
miles higher than it is now, there is no danger.
But there is no occasion to run over there.

30) Thur. Nov. 27 Rio Verde Grande

2.02- Opp- a good new tile roof house - on Bahia side - The last house in the Province of Bahia - 200 metres below the mouth of the Rio Verde Grande. Rio Verde appeared to be about 150 ft. W. but we did not have a very good view.

Immediately above the mouth of the Rio Verde, the land lies quite low for some distance up.

On the L.B. the large bar on the map - below, opposite, and above the Rio Verde is not visible. If there it is entirely submerged. I have no doubt, from a few sticks seen that there is a bar there, at low water; but probably it is smaller than it was.

It is marked "Cova da Manga da

Tabua. I did not see the houses; though they may be there (2 on the map)

We are now

in the Province of Minas.

Above this I will again use L.B.

for left bank of the River,

and R.B. for the right bank.

2.20 Sand bar on R.B. River 1000 ft. 20ft Clay bank on L.B.

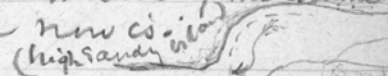
The Ilha da Severino - imbraded in sand bars, is on the R.B. side - beginning somewhere along here.

2.27 I see huts, and cultivation now.

2.28 - L. 80 - about

Thur. Nov. 27. MINAS. 31

The island Severino, L. 80. and its bars have been cut into a different shape by the river.

2.32 We turn abruptly to the left to run right at the head of the remnant of the island when the channel now is high sandy in 

All about the point A. are now of no account, merely sand bars, or unless growth an island

L.B.

The section of the old island, where it is cut clean by the river, shows almost pure sand. Just some little sticks of loam, or clay.

2.39 Now opposite where the river used to run behind the island when it was about 4 m. above low water. as shown on the map

2.45 The channel we are running in is but little over 100 metres wide. It has a high bank on the R.B. side, having cut it for deep in the woods. There is some tree trash in the water for 40 ft. out from the bank.

In a few years the residue of the island Severino will probably be cut away.

2.50- The island ^{now} on our right - is cultivated. This may have been a part of the Severino. (Woods to the edge R.B.)

2.52 The R.B. is now high, nearly vertical clay loam. Recent water level $\frac{1}{2}$ metre ab. present water.

We run now 10 miles from R.B. only. 5 m. S. $4\frac{1}{2}$ S

2.58 Opp. head of the island above referred to - which may have been at or near the head of Severino. Beyond to the right, is a channel; then a large bar extending to the L.B.

3.03 Channel now 800 ft. widening, upward, between the sand bar and R.B.

3.07 Opp. an odd tree very large spread - a number of huts.

32 Thur. Nov. 27. I^a da Esperança ^{High Water island,}
on L.B. Side

3.13 - say. I. 79. (Lower end.) Riv. 1800 ft.

I see a bar ahead projecting from R.B. 500 ft. out into the river. We oblique to Rt.

See also in the dis. directly up river a Mount. several hundred feet high - probably at Manga do Amador on I. 77. near upper end.]

3.19 Opp. Lower part of said projecting bar. Channel due 1200 ft. left.

I see another bar ahead in mid river - which fills nearly $\frac{1}{2}$ the river - on the R.B. side.

3.27 60 meters from L.B. or ^{rather} from outside of high water island Esperança - 800 ft. between mid river bar and said island. (3.28) From the mid river bar to R.B. the navigation (up to this stage and even higher) is quite cut off, by the bars.

3.30 In this channel $7\frac{1}{2}$ $7\frac{1}{2}$ $7\frac{1}{2}$

3.31 Some snags, 40 meters from shore (L.B.)

3.34 From here up to head of Island Esperança

The channel probably remains when it was 25 years ago. on this Coast of the island.

I have just written this, when I notice a large bar extending out from the L.B. side which faces us to oblique toward R.B. There was a bar, in the river, as per Map, but it left a channel bet. it and L.B. This appears to have become too small, and the bar now extends farther out.

3.45 as we oblique we pass close to left of a tree stuck in the sand $2\frac{1}{2}$ meters below.

We now run between the large bar on our right, and R.B. heading for R.B. $2\frac{1}{2}$ 13^m.

3.47 Channel 1400 ft. - S.S. This bar was entirely submerged by the little freshet of the other day - which raised the water $\frac{1}{2}$ meter above its height today. Woods - on R.B.

3.53 On our R.B. a fine large tree - very much resembling a fine American W. Oak. 3 ft. dia. at the butt - and 70 ft. high, near edge of bank.

3.55 Channel 2000 ft. $3\frac{1}{2}$, $5\frac{3}{4}$.

Thur. Nov. 27. I. 78. 33

4.10 (Dinner, Bell. 5.57) say - I. 78.

4.30 - apparently clear river 2000 ft. wide - in middle up to an island near mid river.

4.38 Opp. Lower end of bar on I.B. (Normal R.B.)

Sounding - 2 2 2 2 $\frac{1}{4}$ 2 $\frac{1}{2}$ - 2 2 2 2 $\frac{1}{4}$ 2 2
4.50 2 $\frac{1}{2}$ 2 $\frac{3}{4}$ 3 - 3 $\frac{1}{4}$ 3 $\frac{1}{4}$ 4 - (4° 53') Riv - 2500 ft.

4.56 Opp. Lower end of Island de Caruito In Halfed's time it was a small island imbedded in a large sand bar, which entirely encompassed it.

At present there is no appearance of bar excepting at the upper end where a very long bar as long as the island extends about it, inclining slightly toward R.B. There are several huts, and they cultivated.

We went to the left of it between the island and R.B. Channel 800 ft. - pretty broad R.B.

See that it is swallow tailed - one fork inclining toward L.B. I think this island has not itself changed materially - except that it is probably higher.

5.08 Opp. Upper end of said I^a de Caruito.

5.15 Upper end of R.B. (swallow tail) of Bar - the other


5.22 Upper end of L.B. " " is much longer.

5.22 a small bar shows by itself 200^m from R.B. I

5.15 about - I. 17. - River 2500 ft. wide

(A little more than $1\frac{1}{2}$ leagues below) Manga do Amador] Riv. narrows upward.

5.32 Pretty cultivation on R.B. high ascending bank. Corn looks very bright and pretty new. ^{very} thing looks strong and healthy. - Some cultivation also on L.B. It looks home like.

River 1500 ft. The aspect of the Country here is very pleasing! we are now approaching the Town. Islands high House  up the River hill. It high

5.50 Opp. Lower end of Town - white clay point -

5.52 Opp. First high part of hill

5.53 Opp. Ravine - Hills Raining - crowd with people more respectable looking than usual. Anchor

White clay 15 to 20 ft. up, the residue red clay

Fri. Nov 28 Manga do Amador. 35

I. 77.


Province of MINAS.

- 5.34 Start - just a little after Sunrise.
- 5.37 Opp. highest part of hills. That in sight now about 80 ft - back - it may be 5 ft. or more higher.
- 5.38 Opp. a depression
- 5.39 Opp. middle of another high part 75 ft
- 5.41 " another depression
- 5.42 " middle of the last hill, ^{70 ft} } Then we oblique away.
- 5.44 " another depression. Beyond that up the river the bank continues - about 40 ft above low water, with a rounding top slope.

In oblique ^{ing} across, to within 200 meters of the ~~other~~ ^{island} side - we had 2.2, 2.2, 2.2, 2.3, 2.3, 2.3, 2.3

- 5.47 River 1500 ft. Opp. here the high bank inclines away, leaving an ordinary height bank next the river. We ran out of the channel - the present channel, the Pilot said to avoid a sand bank that is in there.

5.58

- 5.58 Opp. a magnificent Camellana tree on I. B.  3 1/2 dia?

I. 76.

- 6.06 River 1800 feet wide - but ^{Cromata} ~~island~~ I. B. we are inclining off - and run at once into
- 6.10 2 miles - then inclining back again into 3.
- 6.10 we are in 3 m. 2 3/4 (50 m from shore)
- 6.12 Opp. head of Anta on I. B.
- 6.16 Opp. upper end of bar at head of island.
- 6.17 River 2500 ft. wide - we are obliquing gradually toward mid River.
- 6.22 Obliquing from mid R. to R. B. Then, within 200 meters of R. B. - we run up. 4.4.4

36 Fri. Nov. 28. I. 76

6.34 Beautiful cultivation on R.B. side - on top of
* the rounded banks and back on the level.

more like farming! Cromata Island
Note the bar on the L.B. side at head I. Cromata
is gone; but a very heavy wide bar extends out
from the island toward the R.B. side a long
distance, leaving but little channel for that side
in low water. In high water the bulk of the
flow may run through the R.B. side.

June

6.38 Opp. submerged rock 150 meters from R.B. we run
50 meters from it outside.
The cultivation in right near L.B. side, occurs
in patches along river - with intervening
woods. on R.B. Cultⁿ has been continuous ^{to day}
numerous houses on the R.B. side

6.42 The Calcarenous Mount. Morrinhos in
full view directly ahead - the town at the
river end of the Mount which extends
back nearly half a mile from the river.
a fine concave in the R.B. between us and
the town

6.42 Praia along on the R.B. side #

6.50 Opp. Sangrader on R.B.

6.50 Opp. submerged rock 200 meters from R.B. ^{dangerous.}
There are submerged rocks along here -
although the map channel runs close to town.

6.55 about I. 75. River 1800 ft.

7.00 Considerable cultivation on both sides.

The Church - de Morrinhos
7.00 of N. S. da Conceição, makes a
fine appearance from here.

7.10 map says Calcarenous rocks along shore.

7.14 See the rocks along the shore.

7.20 anchored in 3 miles - 10 miles from shore, TOWN.

25

Fri. Nov. 28, - Morrinhos. 37

I. 75.
We visited this place - spending abt.
an hour in examining the Church
the town and the Simons Hill be-
hind the Church.

[It is a compact hard blue stone
polished in large natural masses
rounded off, in the ground in front
of the church.] The Church was built

200 years ago by -
It was never finished. It is the best,
and finest architecturally, that we
have seen in the valley; 2 stories, in
very small
but it is becoming a ruin.

The town is handsomely situated
on a gently sloping hill - the con-
tinuation of the Simons Mount -
and is all above the highest floods.
The town and church are lit-
erally founded on a rock.

a number of
the citizens visited us on board for a
few minutes, and wished us "Bon
Voyage!" Many of the people, (like those
in Manga do Amador) have fled from the place, on
account of the Januaria War.

1 hour 16 minutes - at MORRINHOS

8.36 Start. oblique toward L.B.

8.45 Opp. Pedra Calcarenid^a ^{on shore} ^{500 ft. alt. S. 40 W.} on R.B. River 1600 ft
from R.B.

8.50 150 miles from L.B. running up - 300^m

8.56 - I. 74 350 miles from L.B.

8.56 opp. bad rock! in River 250 meters from R.B.
other rocks submerged. Opp. rocks are there
below a sand bar, which projects above
we ran within 50 meters of the rock in abt
mid river. They are 2 1/2 ft. above present water.
These rocks are dangerous when the water
is about 5 ft higher than it is at present.

River
Rocks

38 Fri. Nov. 28.

I. 74. - 73 ^{also on}

9.00 - Breakfast.
good, clear view 9.00 to 9.35.

9.35 Opp. a bar close in to R.B. It is on Map
This bar helps the navigation a little

9.43 Opp. upper end of said bar, at the shore R.B.

The high mountain in view yesterday morning
far up the river is now quite distinct a league
and a half or two leagues off

We are now approaching the island, to
run to the L. B. side - the old map channel,
the R. B. side abounds with sand bars as I
can plainly see - looking upstream.

9.50 At foot of Island da Resacca.

no bar on this (L. B.) side
Clear channel - 1000 ft. wide to L. B.

9.55 I. 73. ^{great variety of trees.}
all woods on L. B. side

9.55 Opposite a beautiful tree ("Joazeiro")
on top of bank L. B. side. Deep Green.
Other trees in front hide the green part
which I have seen - the trunk.



The island da Resacca has very large
trees upon it. It may have once been the main
land.

10.04 Opp. Resacca - 1 good, long house, instead of
^{it on map.}

10.05 In a very strong current, ^{3+ miles at hour,} 10 miles from island, 4, 4, 4
Water lines show water fallen recently $1\frac{1}{2}$ meters

10.20 Rocks - only 1 foot above present water - mid channel

10.26 opp. head of Island. ^(Resacca) The bar at head is nearly
the same as on Map, on this side, and as far as I see.

10.29 opp. upper pt. of ^{head of} Island bar, now visible. Riv. 2800 ft
This is ^{one} immense bar, extending laterally
from opp. head of island. ^{3000 to} filling $\frac{4}{5}$ of the
entire water way to the R. B. side

10.30 River above bar 2800 to 3000 ft. wide, but
narrowing up stream.

10.47 River 1600 ft. Splendid River!
both shores wooded.

Fri. Nov. 28. I. 72

39

10.40 - I. 72. - about

10.58 opp. rocks along shore - R. B. ^{a low} edge edge of water
10.59 opp. a little rock-islet - 100 miles out fr. R. B.

10.59+ Opp. Lower end of Large island on the
L. B. side - which can only be the I. da
Capão. tho' the dis. appears much too great on map be-
cause the head of island Resacca and this one
was run in 33 minutes - and it shows $\frac{1}{2}$ league on map!

11.01 White rocks at water edge on R. B.

Limestone rocks. These are shown on the
map.

We run between the island
and R. B. in a channel 1500 ft. wide. The
old map channel is on the L. B. side
of island - about 600 feet wide.

I. 71. about

11.10 Rocks (limestone) show at edge of water - flat.

11.15 In channel 30^m from R. B.
Tini woods. No cultivation.
Beautiful variety of green shades.

11.23 Opp. submerged
rocks 100 meters
from R. B. } The same beautiful mountain
ahead still a league or more
off. Covered with foliage, green.
Perhaps 1000 ft. high.

11.26 also opp. Lower pt. of the
island bar at the shore.

[See Sr. Amaranth about distances along here.]

11.32 Rocks - on R. B. side in River - as per map

11.32 Opp. head of island Capão. Its bar
extends above; very nearly same as on map.

11.38 Opp. upper pt. of said bar, which leans on
toward L. B., where the channel is narrow.

11.39 River above this island bar 2000 ft. but narrow,
clearings and cultivation, in patches.

11.45 new tile-roofed House on L. B.

River narrow to 800 ft.
11.50 Opp. a jag - and a tiny islet at L. B. where jag is.
I see no rocks - but they may be covered with boulders.
Half a mile marks Rocks here.

11.53 Here opp. Rocks on L. B. shore (project)

Immediately above them into river 1000 ft. =

Itacaramby (Quartzite) map
(Calcanis)

Rocks at intervals, on shore on L.B. all around the Concave.

map says Pedra do Remanso

Paz. do Itacaramby - ^{75 meters} Deep Soundings = 50 ft. ^{Higher 50 ft.}

Remanso do Itacaramby.

11.58 Limestone rocks large and small shaly all along shore opp. here. Riv-1000 ft.

12.02 opp. up. end of limestone rocks on L.B.

12.04 opp. "Sangradouro", on L.B. { Heavy wood just above. Woods are lighter, back.

We are now passing round the head cum to left.

12.17 opp. a large ^{or cave} notch in the river, on R.B. - where it immediately widens to 2000 ft. Here there are rocks in this Cove -

a projecting point of low rock - stopped the cutting of the river - which recaptured this Cove. Our Channel is on the Concave, L.B. side.

12.19 opp. up. pt. of said projecting rock - limestone. Here we begin to oblique from L.B. and to R.B. or toward Mid-River.

See a bar projecting from L.B. 1/3 mile up; this is not on map.

The Pilot - before I knew it - ran the steamer oblique too soon - and we ran between the two patches of river rock - 1 1/4 1 1/4 1 1/4.

12.27 Near R.B. side - inside of where the rocks are shown on Halsted's map - We should have gone above them all before obliquing in.

12.38 we are now in good channel on R.B. - above the rocks. River 2500 ft wide called Pedra de Togo.

According to the water time the river has fallen here by nearly 2 meters since the recent freshet - just where the rocks are

12.40 We are now within less than a league of the Grand Mountain, on our right,

The same Mountain - since yesterday, (and sketch on page 39) we will get to somewhat near to it - a league higher up the river. (Still say, about 1000 ft. high)

Pico da Serra do Itacaramby

12.49 The water level of recent freshet here 1/4 miles - much less than it is half a mile back.

The river continues very wide 2500 ft.

12.55 Stiff clay steep-slope bank & deep channel R.B. Bar is in L.B. across the river now. This bar narrows the river, and helps the depth in the channel on R.B. side.

1.00 Cultivation on R.B. a few banana trees appear.

1.05 80 miles out. Riv. 1600 ft. ^{wide} to bar on L.B. side ^{4.4.4.}

1.17 70 miles out. Here the recent freshet line shows but 1 mile above the present water - Here there is much more fall in the river. There is a strong current, slowing our rate very much.

There is an island on map somewhere about here. It has disappeared.

1.21 River only about 500 ft. wide to the bar on L.B.

1.22 We oblique here to right, to run the L.B. Channel of the island. do Retiro. It appears to have enlarged since Halsted's time. And the R.B. Channel is much obstructed with sand bars.

do Retiro

1.26 opp. Lower end of visible part of sand bar at foot of island. After a very growth of a hundred and fifty meters begins a rather better island growth; but the island is not of much account. though it is cultivated. Not a large area.

1.28 Channel on this L.B. side 800 ft. to 700 ft. The L.B. side is sandy clay, and of late years it has been cutting away.

1.30 Here channel is 900 ft. I. 68. We run over to L.B. side as we approach head of island - 4.4.4.

(or at (within 10 miles))
1.49 opp. head of Ilha do Retiro. which is nearly all sand, ^{unit 1/2 ft high; cut 2} a little clay near water. We run right for the point of the island. A heavy bar peeks out on L.B. side opp. head of island. The current is now cutting head of island.

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I. 68.

1.49 at head of point Ilha do Retiro - which is cutting away. The old sand bar at its head is gone. The Channel runs thro' it - but there has been a very large bar formed in L. B. side, partly submerged at present; but the sticking brush in spots show where it is; and part of it opp. the head of island is above present water.

1.58 At the R. B. side - 40 meters out, (5^m, 5^m) Riv 2000^{ft}. about one league below Jacare.

2.03 Going R. B. side 40 meters out - below a small point - here we utilize away from R. B. side.

I see the large bar above on R. B. as shown in map - it has now some weeds growing upon it.

We are heading toward the little island on the L. B. side - called on the map, "Ilha da Roda da Fortuna" - then we turn up river -

2.23 opp. lower point of said island.

Long range of mountain, lying directly in front of us - the highest parts nearly or quite 1000 ft. above the river. They are very imperfectly indicated on Walfield's map, and it conveys no correct idea of their continuity and magnitude.

I. 67.

2.27 We strike a strong current here - 3 m an hour. This island is cutting away on this side. Material ^{sand} loam and clay. [Immense bars are toward the R. B. side] Channel here 1200 ft.

2.35 Upper pt. of island - no water runs thro' to day though it did a few days ago when it was a mile higher, but it is an insignificant channel not over 10 meters wide. The land is still low, and there may yet another island channel above.

Fri. Nov. 28.

I. 67. ^{near} Jacare 43

2.40 The river widens out here to 1800 ft. + getting wider for a short dis., then narrowing.

2.45 opp. a second point where water runs thro' and makes the island. This also is quite small, not over 30 meters wide; but there is a wider high water space, where the freshets pour through.

The L. B. show just above this little island channel is low, and it has been cutting recently. (2.50) River now 1500 ft.

2.55 100 meters from L. B. about 1/2 mile below JACARE.

3.05 anchor - at JACARE.

3.10

We had been informed, at Morrinhos, that the invading party had removed from Jacare to a place a league above; but on landing to see the town, we found them still here; and being invited in we went onto the town and had an interview with the Chief of the party and several other leading men in the same.

They knew of our coming and of the peaceful character of our work. They desired to have the privilege of sending one of their leaders with 20 men up on the steamer. This I declined to do on the ground that we must maintain neutrality; and we promised to maintain neutrality throughout.

Two of their number acc. in on board and remained half an hour, and then at our suggestion, the chief sent us an open letter to his men above requesting them to respect our Commission, &c.

They made us a present of some beef - and offered, if we would remain a while to send us half an ox; but we declined on the ground that we were anxious to proceed on our way.

After the foregoing interview with the Chief and Captain

principal men concerned in the attack upon Jamana - we parted in a friendly spirit - promising on our part neutrality.

Jacari stands on a high red clay plateau on the I. B. 350 to 400 ft. above the river. It has perhaps 60 houses - no very good buildings.

4.45 Start running along close to shore -

5.00 We oblique away from I. B. on account of large sand bars ahead on L. B. side. In their overlapping they appear to fill a large proportion of the river, leaving a very small open at the I. B. and the channel that we will find on the R. B.

5.10 We run aground suddenly in one motion with her off - and then the Pilot swung her around too soon and she went aground worse than before - wind working against on our hull - as usual.

5.55 We are in the proper channel. It was a local mistake of the Pilot - and there is no use discussing it. We take the channel between the first and 2

6.05 In narrow 300 ft channel - depth 5. 4.4

6.12 opp. Upper end of 2^o. Sand bar - 4. 3 1/4 3 1/2 3 1/2 2 1/2

6.30 anchor in channel on L. B. side only a little below Sobradinho.

6.12 One of the most striking natural phenomena # ^{enormous} ^{blue} ^{*Sun C*} ^{moon}

An immense blue segment of a circle from the bright cloud C. behind which the sun is setting, over (nearly a little to the north) our heads to the horizon in the East. Complete and perfect. It continued 5 minutes complete and partially, but 6.20 the eastern end thins longest - fainter, but much wider than it was at first. The cloud C - was remarkably bright, and the rays of the sun upon its upper edge were like burnished gold.

6.20 Full moon rose at 6.20 - nearly in the line of the phenomenon, a little north of it - however. The lines did not converge to the moon but to a point a little south of it. Even a portion of the phenomenon continued at 6.30 - (when we anchored in the night in channel on I. B. side.)

The moon was not seen till the best part of the phenomenon had passed; and it may have had nothing to do with; but the coming of the immense fringed globe through the haze was very striking. At 6.35 it is starlight - at least Mars and one bright star are visible. and by the twilight and moonlight I still see to write. | at 6.43 stopped writing

There are 5 bars in the river in the distance of a mile and a half, and they divide the water into six channels at this stage of the river; so that no one is very deep.

From appearance I think that soon there will be a good channel down to Jacare nearest to the I. B.

Some looking river about Sobradinho.

46 Sat. Nov. 29. On L. 66 Lower end, below Sobradinho.

In the midst of the immense bars of the Sobradinho - Sun Rise - 5:35

5.45 Start and at once oblique away from L.B. They bars hang to the R.B. side for a mile or so, and then they are on the L.B. side. Above when we are now the main bar on R.B. contrasts the river to about 1500 ft. - $4\frac{1}{2}$ $4\frac{1}{2}$ (100 meters out) A lovely morning.

5.50 Sobradinho on L.B. Shut up - ^{people} War one long house and three or four others, with tile roofs - a beautiful situation 30 ft. above river. Whitish clay bank. Houses partly embowed in trees.

5.57 ^{at mouth of bank river} Hang on L.B. river 1200 ft. to bar on R.B. $4\frac{1}{2}$ Fine channel along here!

5.59 another house - 30 ft. back L.B. [no people appear - war!] ^{Bank 25-30 ft. white clay with red above}

6.00 opp. a handsome double trunk tree on L.B.

6.05 The clay bank L.B. only 18 to 20 ft. now. Whitish.

6.08 Opp. 4 houses ^{(3 mil) 20} and ^{one 4 houses} people on bank. 25 ft. high a nice situation (70 meters out) Bars ahead toward the L.B. side - first now showing out of water. [6.10 - opp. hard clay lump at the edge of the water.]

6.13 Opp. up. end of the aforesaid large bar on the R.B. side - Also opp. lower end of the bar just now showing above water on this side L.B. (800 ft) I am glad to see that they incline away toward the R.B. - 4-4 - The shore is nearly straight - very slightly concave.

6.15 Opp. a fog in the bank 5 miles wide 1 mile above present water. Possibly it represents some thing on map, but I cannot say what.

6.20 The bars and isles are so different now from the map, that it is difficult to follow the map; but we have a good 4^m channel near the L.B. all along here.

Sat. Nov. 29. L. 65. 47

6.22 We are inclining away from L.B.

6.29 Another notch on L.B. upper end (lower end) according to pilot of I. dos Cabaceiras $2\frac{1}{2}$ $2\frac{1}{2}$ $2\frac{1}{2}$ $2\frac{1}{2}$

We are running between two sets of bars one on L.B. one on R.B. - in incline to the

6.32 R.B. side 700 to 800 ft. wide - lower L.B. bar. The R.B. bar runs out gradually to shore above.

6.34 1000 ft. between bars. [Fine Mountain, behind, on L.B. side]

6.37 $4\frac{1}{2}$ Submerged bar off to our right - which helps this channel - $4\frac{1}{2}$ $4\frac{3}{4}$ $4\frac{3}{4}$ - (6° 38') 5^m

6.39 $5\frac{1}{4}$ (70 meters out from R.B.) (6° 42') - 3-3.2^m

6.44 Visible bar 250 miles to R. L.B. 200 miles to left. Another bar ahead - from R.B. side. The Bar on right runs up into an island, extending above. Ilha Retiro

6.50 Opp. - lower (narrow) bar on R.B. side. 1000 ft. chan. Another bar along R.B. shore - continuous.

Opp. - about where sand become Island, (do Retiro) (head)

Very cool, wind, this morning (6.55) cloudy, new (Sandy) ^(Sandy)

6.56 Opp. up. end of bar on R.B. - 50 meters from island $4\frac{1}{2}$

Another bar in sight directly ahead fills large space of river, $1\frac{3}{4}$ $1\frac{3}{4}$ $1\frac{3}{4}$ 2.22 We have to incline to R.B.

7.05 Opp. lower end of bar on R. P. 64 Doubt. Opp. up. end of island Retiro We are on the

7.09 R.B. 30 meters from shore - 3.3 - 4.4 This R.B. shore is slightly concave here - but much water must run on the L.B. side of Island Retiro

7.10 Limbs sticking up, in spots, near this shore. On our right the river is well filled with sand bars this side of, and above island - Chan. 800 ft. - $4\frac{1}{2}$ $5\frac{1}{2}$

7.13 We run within 25 meters of shore - gentle Concave

Still finer Mountain View, behind to R. ^{cumulated spot} (on L.B. side)

7.21 Opp. up. end of said mid river bar - visible part.

7.22 River 2000 ft. wide - good channel continues

7.30 All along on the R.B. side - $4\frac{1}{2}$ 5 meters.

7.35 There is a bar across (800 ft. off) on the L.B. side water on the L.B. side of the bar, runs my side.

48 Sat. Nov. 29.

7.40 Opp. point on L.B. where the shore makes a moderate
head concave bend in- ^{apparently} ^{an} ^{and} ^{then} ^{behind} ^{island,}
or sand bar with growth on it. We are near the point on R.B. where the Concave
ceases, and the bank turns to left.

7.50 - In now on above on R.B. side, sand bars
apparently closing Channel entirely from
island Retiro to R.B. side. May be a little water.

7.55 we incline to Rt. to take the L.B. channel-

7.58 opp. pt. on L.B. where the hard Concave
Curv begins behind Island Retiro. ^(Somewhat)
^{thin as.}

8.03 Opp. Lower pt. of Island Retiro. Chan- 1200ft
The bank on L.B. is clayey loam, and it has cut
away of late years. We run nearly para-
lel with concave shore 4" or 5".

8.17 opp. 2 or 3 km. Retiro - on L.B. ^{the house}
Bank 25ft. - ^{the house} ^{is back}
Bar on top looks thin & clayey.

I. 64.

8.22 - We search here on the shore ^{another house}
men of the Party in met of yesterday at
Jacaré.

8.27 - Opp. up. end of Retiro Island. but
the large bar runs far above.

8.32 It has been cutting here of late ^{near}
on L.B.

I see an immense bar ahead making
out from L.B.

8.37 we incline to left to run below this first
large bar - meanwhile this island bar
still extends up the river - and we have
to run between the two.

8.40 - Opp. upper end of island bar

At this stage of the river a little water pas-
ses down - between the R.B. and the immense
sand bar on that side - and a little me-
anders between the sand bar and the island.
In extreme low water - probably no water runs ^{there}

8.50 We are now across below the big bar within
30 meters of R.B. - Shore - Water line shows
water of recent freshet fallen 1 meter.

8.54 opp. - house on L.B. River 2500 ft wide.

8.56 Break! Bell - Opp. Lower part of MORRO

Sat. Nov. 29 Morro do Anou. 49

Limestone Rock, Bluff and ledge

Blackish
Reddish
yellowish

Colors on
Rocks

9.05 opp. bluff part of Rocky end - 130ft ^{200ft}
a large bar extends up on R.B. side ^{200ft}
^{width}

Here we oblique across from Bar - over to below
island to run between Island and L.B.

9.20 - opp. lower end of island. 1000ft Channel

Island do Jatobá

9.37 Opp. first house in Jatobá ^{say 20 houses}
consists a string of houses along the bank ^{1 stone has been}
Bank 25 feet high - most of it nearly as high ^{on both sides}
as the floods

I. 63.

9.41 Opp. middle of town - ^{Barca in part - a}
partly gentleman in boards.

9.43 Opp. a draw - dry now.

9.45 We oblique some way - to run over to R.B.
above head of island.

9.47 Opp. upper end of Jatobá.

(Only one island now).
9.47 Opp. upper end Island, Jatobá, (100m width.)
1/3 mile above is the lower part of what
was the second island Jatobá - which is
now part of the main land; at this stage
but little, say ^{to 1 1/2} ^{200ft} ^{200ft} ^{2 miles} ^{long}
There is left a ^{wide} ^{channel} through which
the bulk of the river passes - ^{taken in rain.}
Very little goes down on the R.B. side of island
which has immense bars - 2 1/2, 2 1/2, 3.

Perhaps no water runs there in extreme low stage.

10.02. We are over at R.B. - 40 meters out. Shore
slightly concave, enough with the aid of the
bar 800ft. off to hold the channel to this side
7 meters deep, as in run. 7. 2. 7. 7. 6. 6. 6. cut some

10.00 Cultivation on R.B. bank 20ft. high. ^{Dark line 1/2 m up.}

10.11 opp. where bar begins to incline off toward L.B.

10.15 River 1500 feet - and widening upward.

10.18 Begin to incline away toward L.B. to avoid
an immense (granite) bar going out from R.B.

Sat. Nov. 29th

I. 63.

10.18 Obliquing to Rt. to run below immense (grande) bar that puts out from R. B. side. which closes at least 3/4 of the entire very wide river.

10.22 The L. B. sand bar is now on our Right. We are obliquing between the two. 13/16 1 2/3 2. 2 1/2

10.26 3.33. Now fairly in the Channel between part of L. B. bar and the farther formation of the immense (grande) bar from R. B.

10.30 River at this stage narrows from 2500 ft to 800 ft. The whole river runs here ^{abt} 600 ft or 200 m.

10.31 For a short distance - then widens to 800' again. Now opp. solid ground ext. up. end of L. B. bar - ^{formerly, is a mud bar}

10.31 (Recent water line here 1 1/2 meters up.)

10.38 Opp. a high water outlet of some sort on L. B.

10.40

I. 62.

10.40 Begin to oblique to left above ^{toward R. B.} immense bar [2000 ft behind the bars]

an L. B. big bar above us, on our Rt. as we go. (2 miles lower in obliquing thro.)

10.50 Now opp. ^{at} end of up. end of immense (grande) bar, R. B. (and ^{at} opp. lower end of L. B. bar.)

1500 ft to bar on L. B. - 500 ft to R. B. wide Channel here 2000 ft - narrow about 1800

10.53 a narrow little long bar along R. B. shore opp.

10.55 R. B. to L. B. sand bar 1600 ft - it then widens above the L. B. sand bar running gradually to L. B. 3/4 miles higher up.

11.01 Begin to oblique toward mid-river. The Island Armagosa

in full view 3/4 miles ahead -

From the looks of the bar on R. B. side we will run on the L. B. side of the Island - ^(then go considerable water near the R. B. side.)

11.04 opp. indurated ferruginous looking clay at water's edge on R. B. - Channel 1800 ft to bar

11.14 Opp. Ext. up. end of L. B. bar.

11.15 Opp. lower point of I. do Armagosa. On map this island 3/4 mile wide 1 mile long.

Sat. Nov. 29.

on I. 62.

11.13 Bet. Island & L. B. - 800 ft. Recent W. bank 1 1/2 m. clay bank on L. B. Channel close to L. B. gently concave. Heavy woods on L. B.

The island Armagosa is partly cultivated

11.27 opp. Riacho ^(supper) do Cruz. Barra da Cruz supposed to be here about - but I do not see the houses.

11.35 Opp. Riacho do Cruz - { 3 thatched houses ^{1 above} same 25 years ago below }

11.35 1/2 speed. When within 200 meters of head of island. Running toward island. Another, small ^{high} island above, now in our sight - but is now only a high-water island - as the sand ^{bar} runs clear across to L. B. (another frame.)

11.40 Shallow 1 3/4 1 1/2 1 1/3 - 2, 1 3/4 (Half speed) 2, 2 1/2

Then an immense bar projects out from the little island.

11.42 at last opp. up. end of I. do Armagosa an immense sand bar on the R. B. side now fills up the Channel on that side, as it appears. In floods much water still flows through; but in this stage of the river no water ^{runs in sight} runs through.

11.42

I. 61.

[Sand bar in foreground and a long chain of mountains (3 leagues W) fills the eye above when the river should appear.]

Opp. to where some water runs into the bar on R. B. but it does not ^{run} through - nor at any lower stage. It runs through (20 miles wide) with the 1 1/2 meter fresh.

11.56 at an insignificant ^{mud} island 50 miles long, 5 miles wide. The bar stands from 2 to 2 1/2 meters above present water.

11.59 Now, however, we have a much larger water open on the R. B. side - through which considerable water flows. It is 150 miles wide at start, and narrows to 50 miles 200 miles in.

12.00 Now we opp. the main R. B.

22] Sat. Nov. 29. I. 61.

Water line of recent freshest shows 1 meter up here.
12.05 River over to Large L.B. sand bar 1600 ft.

12.15 About opp. bot. up end of L.B. sand bar. Riv 1800 ft.

The bars ahead on map - chiefly on R.B. side of river - are now semi-(half-fledged) islands, pretty well filling up that side of the river.

12.21 opp. the lower extremity of the above.

12.25 We are ~~quite~~ ^{quite} over to the L.B. side -

Recent water line shows about $\frac{1}{2}$ meter here.

Channel 1000 ft. Banks clayey loam, 20 ft.

L.B. moderately concave - bar 1600 ft. off

makes good channels (Recent water $1\frac{3}{4}$ M.)

12.32 - Opp. a high water (or rain-water) outlet L.B. on ^{a small hill at} ~~Sangrador da Vondamunha.~~ ^{Cascalho.} Perhaps

12.36 Recent water line 2 meters. Cattle licking the soil on the clay slopes. - Banks 20 ft. to 25 ft.

I see a bar ahead on this L.B. side.

12.41 We begin to oblique toward R.B. below ^{ahead} the bar 5. 5. 5. I think the channel will be good on this oblique, the entire river comes around here between the half-fledged island bar on our left and the L.B. bar on our right (5. 5. 5) (12. 41)

12.51 3. 3. 3. 3.

I. 60.

12.56 Opp. the water outlet on R.B. side between R.B.

and the half-fledged islands sand bars.

It is 100 meters wide, but it carries very little water at this stage - and little or none in extreme low water. The actual water now is only 50 meters, shallow, and slight current.

12.58 Our main channel now to L.B. bar = 800 to 900 ft. but widening above. we are close to R.B. (30 meters)

Recent water line $1\frac{3}{4}$ M.

1.05 We are now obliquing to Rt. between island ⁴ sand ^{bars} on our right and ^{bars} on the left. There is ^{on R.B. side} some water coming down among the sand bars. The island (1.07) 100 meters on our right. On the left the bars are 1500 ft. off. $2\frac{1}{2}$ $2\frac{1}{2}$ $2\frac{1}{2}$

1.09 water line recent freshest - $1\frac{1}{2}$ meters. A wide space on L.B. of flat sand, where the water ran through

Sat. Nov. 29 - I. 60.

(53)

The water will have to be at least 3 meters higher than it is now to render it safe to run through this L.B. side.

1.15 A pretty pyramidal Mt. peak distant 4 or 5 leagues up river bears about S. 30. W. -

1.18 We are now on L.B. side, the mid river sand bar only 1000 ft. from L.B. Good channel. Sandy banks only 10 ft. high - Cultivating. Covered small, numerous thick, together trees. 1400 ft. pole size.

1.25 opp. a water channel - or head of an island. I think it is the outlet of a dry water course, even it is also the head of an island - a high water island.

A bar ahead ^($\frac{1}{4}$ mile) now projects from L.B. side.

The mid river, and R.B. bar incline $\frac{1}{2}$ to end above on the R.B. shore.

1.28 We begin to oblique on acct. of bar above -

The opening between the bars is 2000 ft. wide; so that it may not be very deep. So little water goes down the R.B. side, however, that there may prove a good channel. 5. 5. $4\frac{1}{2}$ $4\frac{1}{2}$

1.32 We are running ^{50 to 60 meters} pretty near to the upper bar which from its abrupt front I judge to be the best course. 4, 4 - 4 -

1.34 Now we are leaving the L.B. bar - and the bar is leaning us. We must now over to R.B. side. $3\frac{3}{4}$ $3\frac{3}{4}$ $4 - 3\frac{3}{4}$ $4 - 4\frac{1}{2}$ - Bar 500 ft. to Rt. L.B. about the sand bar 1000 ft. to left = 1500 ft. channel.

1.38 I now see an island just ahead on our right. which I judge is the

I. 59. Ilha do Rodador.

Some, but not much water runs in the L.B. side

We run to the R.B. side 5 - $4\frac{3}{4}$ $4\frac{1}{2}$ $4\frac{1}{2}$

1.42 Channel from R.B. to Bar, 1000 - to 1200 ft. ^{then narrows} above.

1.44 opp. (about) lower end of (Supposed) I. do Rodador Bar all around this island, now - an immense bar at the head runs apparently to L.B.; though there must be a water course at point

1.46 Recent fresh line 1.40 on R.B. - 1000 ft to S. Bar L.B.
 River is widening above this up to Point on L.B.
 The large sand-bar, from head of I. Rodeador,
 runs to the said Point - $\frac{1}{2}$ mile ab. Island
 The 20 ft. high clay loam bank on R.B. has
 been cutting - stands in place, vertical.
Beautiful looking River above!

2.00 We oblique toward Mid River - from R.B.
 and continue obliquing toward Point on L.B.

2.08 Opp. up. end of large bar on L.B. side below
 Point - P.S. L.B. along here means the
 side of the island Rodeador extended -
 It is a high water island.

2.10 Opp. Point on L.B. a square end point ^{200 ft long}

2.12 Opp. lower end of small island on R.B. side.

2.18 Opp. Channel - when water runs down be-
 hind island Rodeador. It is nearly
 closed at present stage - In low water
 probably no water runs through -
 though the channel in freshets is 150' wide.

The map confuses me along here - the topogra-
 phy of the islands and bars is so changed.

2.22 In strong current 30 meters from L.B.
 This bank is very sandy on top, and cuts dense,
 small woods to the brink. 1000 ft. to the bar.

2.25 ^{have abt} We passed BOA VISTA ^{on R.B.} - 3 or 4 houses
 Water line of recent freshet $1\frac{3}{4}$ mi here.

2.30 We appear to be opposite an island. It may
 have been the large sand bar of Halford's time.

Say L. 58. lower end.

[Great numbers of small yellow butterflies - congregated
 at one particular spot, on a bank. Since to day, I have seen it.]

2.35 See a large bar head (not on map) pro-
 jecting from L.B. We oblique toward R.B.
 This bar goes out a thousand feet or more from L.B.

view
 2.40 P.M.



2.44 on R.B. side - 40 meters out. also ^{of large bar}
 1000 ft - water to bar which projects ^{on L.B.}
 out from L.B. 1000 ft or more.

I think it must be the Island Moradeira - an old
 hill.

2.55 We have been bungling in shallow water - for
 some minutes - in a very strong ^{3 miles an hour} current - close
 to shore - We see fishing - below the town.

3.06 Opp. upper end of bar on L.B. side - and a low place
 on the R.B. side.

3.12 4 meters near R.B. River 2500 ft wide - or nearly -

3.14 Begin to oblique - for the L.B. side -
 2.2 - $1\frac{1}{4}$ - $1\frac{3}{4}$ - 2, $1\frac{3}{4}$ - large bar ahead, from the
 R.B. I think this must be the large bar, which
 overlaps the upper end of Ilha da Moradeira. If
 it remains any thing like what it was 25 years
 ago.

3.25 Now on L.B. within 60 meters of shore 4.4, 4 $\frac{1}{2}$

3.27 Pedra da Olaria. on the shore L.B.

The recent freshet line shows 2 meters ^{full} here.

Bar now on an left 1280 ft. from L.B.

3.30 Opp. Pumaçu (Torno) on L.B.

3.35 " " " " " "

3.39 Rocks project (to day) 1 foot above water -

3.55 Opp. lower end of immense bar in mid river
 extending now more than a mile below town -

56 Sat. Nov 29. - Januaria I. 58

Channel 1000ft. now - approaching Town
On map it is only about 300 to 350

4.00 a small land drain opening - Riacho

4.02 Opp. Riacho do Quinta.

A great change since 1852. in this part of the
river and its basin -

4.24 Arrive at Januaria - Port.

We went on shore, and were met
by a small old gentleman, and a little
crowd of gazers. On inquiring for
the "authorities" the gentleman told us
that they, and the troops had all gone
up the river 2 1/2 leagues - on the
opposite side, to Nossa Senhora da
Conceição das Pedras de Maria
da Cruz.

This gentleman was our Creole
through the upper half the town -

Claim 800 houses - and 8000 Inhab.

allow 800 houses (same as 565) and 5000 "

At present there are not over 1000
or 1500 inhab. - the others have retired
before the supplant invading army.

Some went with the authorities, some to the
woods - some to other places in the river.

The old gentleman said he was the
Presidente of the Municipal Camara, and
asked for a passage on the steamer, up to
where the authorities, which I was obliged
to decline. As we were looking at some

ostriches, already and her daughter invited
us into the house, and we spent half an hour
in chat and looking at her little menagerie
of birds and animals. It was said that she
is the wife of the brave Capitão who ordered
the vanishing of the troops from Januaria.

We stopped at the new church now
being roofed - and saw the Missionary Priest -
who seems a good man. The Padre fled
with the authorities for reasons.

57 See page 81

They have a great quantity of
gold and silver, and are very rich.
I will take in a week yet. Certainly the
Americans, and the coming here,
I suppose that the money will be
taken up the river - some on horses
of an old that place, and a traveling
"authorities" and the troops have
P. J. viz. 2. P. J. viz. 2. P. J. viz. 2.
but there is a little from here yet.
from (place) it is too far to send
a letter from it is better, and thus it is
Januaria is the place
P. J. the navigation from
It can be done &
common from residence
I have the money &
dropped out of the
M. M. M. M. M. M.

The evening began.
We gathered from together first grand
that the number is so large that I can
for inspection. However, if I can find
they are a quantity in interesting
order, they are in few in number, but
or 2 orders it may.
found in great their captives in Januaria
unknown to me, the "Americans" were
at a safe distance; and, for some reason,
British force, and the river, are
it is all right; the authorities, and the
now; from whom the extracts. I suppose
secret that they refer to a document, but I
make out "clear, the sum of the platinum
who undertake Portuguese,
Portuguese, with the members of the
from Januaria; they spoke much, in
several other gentlemen who came here
next, the Captain, the vicar, and
of the domain or estate, and met the
the "Americans", and

We arrived here
at 10 o'clock on the 30. 1879
Next day we
at 10 o'clock on the 30. 1879

56
Commissão Hyd.
Luz. Sr. 2^o
Com.
Sr. D. Luiz Plinio d' Oliveira
Secretaria do Ministerio d. n.

On board Sr. Presidente Dantas
Jannaria, Province of Minas
On League 56 $\frac{1}{2}$ N. W. 30, 1879.
Côrto

On the 26th Inst. at Caranhana, (League 87) I had the honor to mail to your Excellency two letters giving accounts of my impressions up to that place.

Between Caranhana and Jannaria, 31 leagues, the navigation is good, in the main Channel, all the way, needing no work to be done by the government.

We met a freshet some hundred fms below here, which raised the water about two metres, in all, above low water; but for a number of days it has been falling, and in places it shows from one to one and a half metres below this freshet line; so that it is not now more than one metre above its lowest stage.

The Country has continued to improve as we have advanced. The forests are very much finer; and the Cultivation ^{top of} the benches of land along the river has a remarkably healthy, thrifty aspect, quite different from that along the lower part of the Upper Valley.

Jannaria, is the largest City we have visited. We arrived here yesterday afternoon. On landing, we were informed that all the "authorities" and nearly all the "people" had abandoned the place, on acct. of the apprehended approach of an attacking party opposed to the present authorities. We found most of the houses closed, and their owners or former occupants gone. It seems to be understood that the invading party could enter and take possession of the place to day. There is nothing to prevent it.

The authorities and military force have gone two and a half leagues up the river, on the opposite side, to Na S. da Conceição das Pedras de Maria da Cruz. 159

The quarrel, it is said, originated in the action of some one in authority here against an individual, who charged that it was unjust; and declared war against the authorities, and proceeded to arm men and arms. It began last April, partially subdued, and was renewed some time ago.

Concerning the merits of the dispute, or the action of the authorities, I have nothing to say; but I regret to find matters here in such an abnormal condition, as it prevents me from getting a fair idea of the place and its resources. There is none here, for the present.

On inquiring about the mails, we were told that a mail would leave for Rio de Janeiro on the 1st of December tomorrow; but not from here; but from the place above whether the Post Office has gone, with the "authorities."

We have had the good fortune to find a pilot, who lives near here, who is acquainted with the river above here; and about mid-day we expect to start and run to "Pedras de Maria da Cruz" which is said to be a good place for getting wood; which we will need.

We hope, with one more wooding after that, to reach Pirapora, or the Forks of the river, if the steamer can get up.

They speak about a difficult place, at "Cengicos", about 13 leagues above here; but I do not anticipate any material difficulty there, or elsewhere, up to the Forks. The swiftest current shown by Hatfield between here and the Forks, is 2 $\frac{1}{4}$ miles an hour; and we have already run up against 3 miles an hour. About the Forks, 5 leagues, to Pirapora, no soundings are given on the map.

5260] If I cannot get the steamer about the
Forks, I will go to Pirapora in a canoe, or
on horse back, whichever may suit best.

The falling of the river after the little
flood, and the absence of rain, favor our
observations of the Channels and bars; and
the weather continues charming.

The bars and Channels have
changed greatly along this portion of the
river since Halfed's survey. Here, at
Tamania, where there was then only a
narrow Canal not navigable, and an
immense bar fronting the city, there is
now a splendid Channel 5 miles deep,
and the river is a quarter of a mile wide
over to an island.

Halfed proposed to
expend 4000,000 to improve this part.
Nature has done it, much better than
man could have done it, without change.
We have found a number of such
places; but always there is a good Chan-
nel somewhere.

I will leave this letter open till we cross
this evening.

See back - page 57, for
Continuation of letter.

Col. O. C. Jarvis
Rio de Janeiro

Tamania Nov 30/29

Wrote a 2 page letter

Nov-30- at Tamania - telling him in substance
much of the above, and stating that
I had given (and am still giving) the subject
of this river my most earnest cogitation -
and that I believed that I already com-
menced it my will - and that if I was
successful in getting to Pirapora and back
to Rio with all our information I would
regard it as the most successful and
the most important season's work of my life.

Sun. Nov 30

Januaria I. 56

61

Hiring another Pilot on board, who is
acquainted with the river above here,
to act in company with our regular
Pilot, Louis.

(New Pilot named,

We leave Januaria, bound for
Pirapora.

Water raised 5 inches ^{night} _{city side.}

- 1.33 Start - in channel 150 ft. wide - on the
2.3-4-4 $\frac{1}{2}$ -4-3 - then incline off towards L.B. or
island - a little less mud - then back gradually to
near mid river about 4 miles -
- 1.44 opp. last of Babut scattered houses -
- 1.47 Bar on our left 150 miles, L.B. 250 miles - 5.5.
L.B. Shine above from slide cutting - Crossy day.
- 1.51 now 150 miles from L.B. and 250 from Bar.
Bar begins to recede 4 $\frac{3}{4}$ 4 $\frac{3}{4}$ (1050)
- 1.55 River widens out now rapidly bar runs over
to R.B. 4 $\frac{1}{2}$ - 4 $\frac{3}{4}$
River becomes half a mile wide
2 $\frac{3}{4}$ 2 $\frac{1}{2}$ 2 $\frac{1}{2}$ we show off some below Island.
- 2.05 opp. lower part of Island de Barro Alto 2 $\frac{3}{4}$
3-2 $\frac{1}{2}$ obliquing to left 2 $\frac{1}{2}$ - 2
- 2.08 River pretty nearly toward high ^{30 ft} clay bank on
R.B. then in incline gently upward in 3-8 $\frac{1}{2}$
This is one of the widest parts of the river -
The Pilot has put us thro' the best water
the island and its bar far more than $\frac{5}{8}$ of River
- 1.55
2.13 opp. sand clay bank 150 miles to left Bar 300
miles a Rt. Channel 450 miles wide 5 $\frac{1}{2}$ 5 $\frac{1}{2}$ 5 $\frac{1}{2}$
Am unable to make out head of island it is
embedded in sand bars.
- 2.15 now 30 miles from show 7. 6. clay bank cuts ^{it}
[Water here shows fall 2 miles since (River)]
- 2.19 1200 ft. over to bar - 6 $\frac{1}{2}$ 7 $\frac{1}{2}$ 8 $\frac{1}{2}$ Butterflies again
- 2.24 High banks - Barro Alto pushed ^{Barro bank} _{up}

- 2.25 Opp. a low place in high bank when the river runs through in floods
- 2.26 Opp. place on L.B. bar side when water runs thru. Get bars and behind Island Channel from R.B. to bar - 1200 ft. 5.5.4%
- [Opp another barca with family in morning up]
- 2.30 We are running nearly due to mid river. 2.25 2.25 2.25 2.25 3. Near mid river 2.33
- [Family in shore on R.B.] from Jamanaia.
- 2.37 Channel 1500 ft wide
- 2.40 Opp. head of a sort of island bar, run toward
- 2.40 L.B. Much water goes down that side
- 2.40 Bar run on R.B. shore, extends 150 m at its head. This bar behind but 250 meters from R.B. - now 2000 ft behind Bar on left and the L.B. shore -
- 2.47 Bar & shore have converged - now 1400 ft.
- 2.48 Bar begins to oblique off to R.B. shore on the whole the run widens again - on R.B.
- 2.51 We are heading for ^{source} J. B. shore - up and back River curves to Rt. I. 54 2 or 300 ft?
- 2.56 We begin oblique to left from L.B. shore on R.B. Perhaps Alto Grande.
- 3.00 a large bar projecting from L.B. shows 1/2 mile ahead. It is no doubt in that acct. that in an obliquing thro 2 to 2 1/2 m. water. I think the steering thus far is all right.
- 3.03 River is 2000 ft wide - 2.25 2.25 3.03 past mid. hour to our left at 3 P.M. Splendid River - [always dark clouds [Butterflies again]
- 3.09 on L.B. Concave short - close to shore 5.6 [water line 1 7/8 miles]
- 3.11 Opp. lower end of big bar on L.B. [Hundreds of Butterflies at most clay]
- 3.15 Channel 1500 ft. to bar. R.B. shore is normal - gentle concave. Channel 1500.
- 3.19 Riacho do Palmesinho - 3 meters wide Very gentle concave continues all the way to town.

- 3.22 Normal clay bank continues on R.B. - gentle concave 1300 ft to bar - Now bar begins to widen toward I.B. and river begins to widen.
- 3.26 Portuguese clay at water edge - we are 30 m. out. 7.77
- Elegant navigation!
- "Nossa Senhora da Conceição das Pedras de Maria da Cruz" has been plainly in sight for some time.
- 3.30 [Little fresh water line here 1 1/2 miles] 1800 ft
- 3.36 Opp. upper end of the long bar on L.B. 2000 ft
- 3.38 Approaching town close along shore in 4 meters - 2000 ft.
- 3.41 Pretty little foresta of trees rising ground from the bank Hard clay like Rocha
- 3.46 anchor. A number of people assembled on the church pavement - which wd afterward learned were the authorities and troops from Jamanaia.

After dinner, we went on shore and met the authorities of Jamanaia - The Judge, the Captain, the vicar and the Post master - At a house the vicar handed round coffee which was my good.

The Judge was the Chief speaker. He talked loud, rapidly and long, and repeated much. He explained his position - his having only arrived in August - ordering an armistice and thus exciting the enmity of the opposing party.

The Capitão related his story of seeing great numbers of armed men.

The Padre spoke about his being personally mimical - and of their threats to castrate him - which he thought would be a sad misfortune, for one in his position!

5 64 Mon. Dec. 1st Nossa Senhora da
da Conceição das Pedras de Maria
da Cruz

This is a small place, of no account, with
some 20 houses - and a Church. At
present the Church is a barracks for the
troops.

It is handsomely situated with deep
water in front, and a fine, rising
hill rising above the highest floods.

There is a sort of conglomerate rock point
at the upper end of the harbor.

I should think from the contour
of the river above here that this place is
likely to continue to be at the Channel.

There was a depth of 20 to 25 fathoms in
1852-53 and there is about the same
now.

We made arrangements to
get wood here - and on do not ex-
pect to leave till tomorrow.

Before our breakfast the "Authorities"
make us a visit. I was in my cabin
writing, and as no one called to tell
me of the visit I went on - and wrote
4 pages of letter during their visit - this
before our breakfast about an hour.

Sometime after the Judge sent us
word that a man had come from
Januaria, stating that the enemy
had entered and set fire to houses
and intended to come right on here,
and that they intended to remove
farther up the river, and advising
that we had better hurry away, &c.

I took the liberty of not believing
a word of the story. The Authorities
and troops no doubt believed it, for

Mon. Dec. 1st P. de Maria da Cruz 65

not long afterwards I was informed that
that they had all perished.

Previously the Judge had requested
a passage on the steamer, on his way
to Pirapora - to see the President of the
Province and relate the whole story to
him.

I declined having the steamer
placed in a position that would de-
stroy her neutrality, and also he was
informed that we had been obliged
from the beginning of her voyage to
decline to take passengers.

Now, an hour or two, after
this flying artillery Company had
departed comes a man from Jan-
uaria and says that the other
party entered the town, about 7 o'clock
this morning, peacefully, and that there was
no trouble of any kind, and that the people
were returning.

I do not yet know (though I
am anxious to know, how many of the terri-
ble invading party entered. St. Necco
is the chief - the one we saw in Jacaré,
and I imagine that he is smarter and
more shrewd than any one or all of the
"Authorities". I am naught enough
to believe that they are a pack of
cowards - though I know nothing
of the merits or demerits of the parties
to the controversy. I am not sure that
the other party is any braver. Having
been nothing on either hand that
reminded bravery.

I am anxious to hear
about the "200 armed men surrounding or
protecting Januaria" and "the 14 oxen killed
at midtime for their food" and "20:000 \$000
already spent" and the resolution "to spend a
100:000 \$ if necessary". All interesting points.
It is proved to be not a good place for wood!

66 Tues. Dec. 2^o N^a. S^a. da Conceição
das Pedras de Maria da Cruz

After losing a day and $\frac{3}{4}$ hrs we
have added only about 1800 sticks
of green wood to the stock in hand,
about half of which was cut by
our men. Well, well.

We have spent a whole morn-
ing getting part of this wood on
board. Sick in life. Oh! to, to

Water has risen $\frac{1}{2}$ a metre while we have stopped
A.M. Channel 1500 ft. L. 53 $\frac{2}{3}$

11.23 Start opp the Church [late barracks]
Rock bluff begins at Tam ends $\frac{1}{4}$ M. above
11.29 opp. upper end of Rock bluff

Since Halfeld's time, the Coroa do Frango
has changed to an Island, and the
Channel is now on R.B. where the
bar was, while the L.B. channel is
much obstructed with bars.

11.38 We now head for the R.B. shore

11.41 opp. lower end of new Island. The
Channel from R.B. to the island
is 1000 ft. full. It still cuts a little on
the R.B.

11.46 Freshet line $1\frac{1}{4}$ m. ab. point water here
opp. this island.

There is a Tree on this
new island at least 10 years old, and
the upper part of the island is now
cultivated, and has huts on it.

The island is sandy loam, and cuts
some. The R.B. shore is clay chiefly,
and cuts very slowly.

It is a noble Channel - 4^m


11.58 upper end of new island -

12.10 2000 ft. to Bar on L.B. shore. along here

Dec. 2^o Tuesday.

67

woods, on I. 52. both sides.
Wind ahead.

12.21 Run 2200 ft. wide to L.B. ^{approaching} upper end
of the big new L.B. bar. ^{about} a peak to the right - 

12.26 we are beginning toward
the L.B.

12.28 opp Point on R.B. a new clearing - short.
Run 2800 ft. wide. ^{4 1/2 4 4}
Steering for upper end of bar on L.B. shore.

12.32 Approaching L.B. shore - very wide now, but
we have no less than 4 miles in the crossing.

12.35 on L.B. side 50^m from shore $3\frac{1}{2}$ $3\frac{3}{4}$ $3\frac{1}{4}$ 4
Run 2800 to 3000 ft. wide.
Water (freshet) line, here, $1\frac{1}{2}$ m. ab. point ^{river}

12.39 30^m from L.B. $4\frac{1}{2}$ 5. Approaching island above
^{mentioned} this island in Halfeld's time, was entirely
imbedded in sand bars, an immense bar. The
bar extended $\frac{1}{2}$ a mile below the island.

Now there is no bar below the island - the
channel is where the bar was. There is water
behind the island, now, in a width of about
60 miles; but in low water little water goes through.

12.50 opp. lower point of island. ^{Huts, and some cultivation on island} Which has a totally
different shape from the old island on map.
We pass 100 miles from end of island

A pair of the ^{old} large bar toward upper end of
island has now become ^{part of island} a low land, covered
with growth - then out from that, projects a
sand bar still, contracting the width of the
river from near 3000 ft. to 3.3 , $(12'56'')$ $3.3\frac{1}{2}$ 4.
about 1500 ft. - narrowest spot.

12.57 Cultivation, ^(back 200 miles) along here on R.B. from "Clearings".
In front of pretty woods - looks pleasant. Big fields
not very flat.

An elegant navigation!

1.05 opp. the most projecting point ^{side} of island bar
1400 ft. Bar to R.B. - heading for R.B.

- 1.10 The sand from the said island runs a long dis. up-widening the river gradually.
- 1.12 Opp. a low place in R. B. (100 meters from shore) steering now gently toward mid river. R. B. shore has been cutting a little. The recent freshet line looks only 1 meter above river. Channel here 1500 ft. [A beautiful looking river ahead.]
- 1.19 Pilot says there are some rocks in here to an extent - we are 200 meters from R. B. which appearance of ferruginous clay or rocks - probably like those at the turn back.
- 1.21 Channel 1600 ft to L. B. (or island) bar -

I. 51. (Head wind continues.)

- 1.27 River 1800 ft to said bar } We are ob-
 1.29 " 2000 " " " " } liquing to
 1.31 " 2200 " " " " } the L. B.
 1.34 " 2500 " " " " } side.

(The river is very wide above, and has large submerged bars - as I see from sticks. We are now opp. a point on said bar, 10 meters out from it - (5 or 6 meters deep) The river is now cutting this sand pt. away & stands 15 ft. above water. River 2600 ft. wide.

- 1.40 Now opp. low place - where river runs thro - and gets behind the aforesaid island when one meter (or so) higher. The recent freshet line is within a few inches of the top of the sand.
- 1.41 This is the extreme upper end of this immense island bar, we have been passing. From here upward the river narrows a little to the point above.
- 1.46 on L. B. side 40 meters out. [1.50 - some splendid bars on L. B.]
- 1.52 Opp. point in L. B. channel close to it. River 2500 ft wide.
- 1.52 Now Pilot obliquely to left - to run below

- an immense bar putting out from L. B. On this evening - we have an low $2\frac{1}{4}$ miles - generally $2\frac{1}{2}$ - $2\frac{3}{4}$. We run about 800 ft to left of bar. Possibly a little too far down; but it is safe. The Pilot makes nearly a bee line by it -
- 1.58 200 meters out from R. B. - $3\frac{3}{4}$ - $4\frac{3}{4}$ - $4\frac{1}{2}$ Channel between R. B. and bar. 1600 ft. [Mountains ahead, 3 or more leagues off.]

- 2.02 Channels & cult. on R. B. - 1600 ft to bar.
- 2.05 It is not cutting on R. B. we are 300 meters out. and 150 meters from preceding sand bar. - $4\frac{1}{2}$ - $4\frac{3}{4}$
- 2.12 Opp. a little rock reef near and parallel to R. B. It does no harm. It helps to concentrate the wide river - we are 80 meters from it in 10 meters depth. Channel to bar 1500 ft -
- 2.15 The channel is along where we are running, 100 meters out in 10 meters depth. a 2 mile current just here

The bar is receding toward the L. B. and the river is rapidly widening -

- 2.17 Still 10th spreading on the clay bank. The recent freshet line is here not over 6th from River, 2000 ft. wide - 150 out.
- 2.21 10 meters deep and stiff current - River 2500 ft. wide
- 2.23 We are heading a little for mid river $5\frac{1}{2}$ - $2\frac{3}{4}$ - 5.
- 2.26 Opp. upper end of said bar on L. B. $3\frac{1}{2}$. 200 meters out from R. B. - still inclining toward mid river.
- 2.27 I see large bar in mid river - making out from R. B. side - Pilot is obliquing - $2\frac{1}{4}$ - $2\frac{1}{2}$ - $2\frac{3}{4}$ [Some water goes between this bar and R. B.]
- River here ^{over} $\frac{1}{2}$ mile wide! above the L. B. bar
- 2.31 In the oblique $2\frac{1}{2}$ - $2\frac{1}{2}$ - $2\frac{3}{4}$ - $3\frac{1}{4}$ - $2\frac{3}{4}$

I. 50 about here - L. B.

- 2.37 We are obliquing on a cack of Central bar toward $4\frac{1}{4}$ - $4\frac{1}{4}$ - $4\frac{1}{4}$

- 2.39 Opp - most fragmentary part of bar - visible, 5^m
150 meters out from L.B. Bar then recedes
rapidly toward R.B. - $\approx 6\frac{3}{4}$ 50 miles out.
- 2.41 40 miles from L.B. very sandy bank, which
cuts some now - 7^m 7. Shows a cut now
into a gentle concave. It was about straight
in Halford's time.
- 2.45 River rapidly widening as bar recedes. ^{2000 ft.}
but good channel along L.B. shore.
Very stiff current - 2 miles an hour
- 2.50 Opp. upper end of said central bar (panon)
toward R.B. shore.
River now 2600 ft. wide.
- 2.51 opp. where sandy bank ceases to cut
at this time on L.B.
[The recent fringes line 0.80^m above river]
- 2.52 Begin obliquing toward R.B.
The bar presumably on the L.B. side
above here below the Point $\frac{1}{2}$ mile ahead
is submerged - we get in crossing
3. $\frac{1}{2}$ - 3 $\frac{3}{4}$ - 3 $\frac{1}{2}$ - 4.4 - (2^o. 57) 4. $\frac{1}{2}$ (Riv - 2800 ft.)
River banks are comparatively low on
both sides.
- 3.00 In mid river - 1400 ft each way ^{4 $\frac{1}{2}$ 4 $\frac{3}{4}$ 4 $\frac{3}{4}$} to shore
on R.B.
- 3.02 Opp. Pedras d'Areia - Sandstone Rock
River 2600 ft. wide
- 3.05 Opp. Good House Tea roof - "Bebedor"
with a very beautiful tree in front.
No bar apparent in sight ahead: but a tiny
green islet, in mid river, $\frac{3}{4}$ mile ahead.
- 3.08 The tree foliage on R.B. opp here is right down
into the water.
- 3.10 Opp. a tiny rock reef on R.B. shore 180^m ^{near the} miles
of where in river - It does no harm - ^{as Contrari.}
- 3.13 Opp - another House - Suppose "Capivara". Trees
nearly hid it. Recent fringes line 0.80 m ab. Riv. ^(with)
- 3.18 Lumps of rock (or hard clay) on R.B. shore.

- 3.20 1.70 miles out from R.B. - River 2600 ft. wide.
- 3.21 Now I see sticks, giving evidence of the bar on
the L.B. side - that is submerged.
- 3.24 Opp - a tile furnace on R.B. ^{water line 1 mile}
- 3.27 Opp - Tiny green islet - in mid-river. ^(I think there is a water nucleus to it.)
Bar now visible opp. on L.B. and also a
short ^{200 meters} ~~dist~~ ^{above} in mid river - $\frac{1}{2}$ mile wide.
Shallow all along, in mid river - from Tiny
green islet up to visible bar.
- 3.32 Opp - a house + cultivation on L.B. Strong current
- a 2 $\frac{1}{2}$ miles an hour current here.
- 3.34 Opp. Lower end of visible mid river bar - ^{Islet}
Water on the L.B. side $\frac{1}{2}$ mile ab. ^{Tiny}
- 3.36 Opp. Black rock on R.B. shore partly imbedded
in gravel!! Gravel is a rare sight -
We have seen ^{with} none for many miles!
Here is a gravel and black rock bar of
beach for 300 meters along shore - The rocks
have an iron ore look.
Channel to the bar - 1400 ft. High clay banks.
- 3.41 The bar is now receding toward L.B. side
and widening the river - L. An. Channel.
Freshet line 0.80^m here.
- 3.43 More iron ore looking rocks at water's edge, R.B.
- 3.48 Opp. Ext. up. end of visible, L.B. Bar -
River 2700 ft. wide -
- 3.50 Fine corn cult on R.B. high bank.
- 3.55 Rio Mangahy - on R.B.
Some ^{5 miles wide} bars a mile above on R.B. shore.
- 4.32 RIO PANDEIROS - L.B.
Called "Riacho" - 10 metres wide.
on other maps, the Pandeiros is the larger.

72 Tues. Dec. 2^d I. 49.

4.37 ^{meant} River half mile wide. Say 2500ft. Running near L.B. shore - when channel is.

4.39 I see a bar half mile ahead on L.B. We are obliquing toward R.B.

4.45 Near R.B. opp. House, suppose lower end of Capão - which had 2 houses in 1852. 80 meters from shore - 5.5.5.

4.49 Opp. another house -

4.51 Opp. Point on R.B., where the bank immediately bends to left - rapidly widening the river I. 48.

4.52 Opp. lower end of wide sand bar on L.B. We now oblique toward mid river. Managome Concan wooded shore on R.B. for 1/2 league ahead.

4.53 Channel here from R.B. to (1400 ft) bar.

4.54 In mid river 700 to R.B. 800 ft bar. Now we head for R.B.

5.03 Opp. Concave (3000) River 3000 ft wide. 30 meters from R.B. shore - 5.5.5.

5.05 Oblique to Rt. hand. Bar 2000 ft to an R.B. ^{bar} _{side}

5.08 Opp. upper end of said bar on L.B. as we are obliquing - 3.3 1/2 4.4. River 2600 ft. Beautiful River ahead. Lake-like.

5.15 Near L.B. near a Point. River 2600 ft. but widens at once above, very much. on L.B. shore.

5.20 The widest place, here 3300ft - ^{water} _{clear} very gradually narrowing above. Channel on L.B. side - 5.5.5. Splendid Navigation!

5.27 On L.B. shore - 30 miles. Freshet line 0.60 ^{here} _{only}. River 3000 ft. wide.

5.28 We incline gently away from L.B. Looking back and forward it is like a handsome lake. Chocolate color again.

Tues. Dec. 2^d I. 47. (5098) 79
Riv. 2600 ft

5.38 Opp. Point on L.B. - obliquing to R.B. Δ

5.40 On R.B. - 20 m. from shore - 3 1/4 3 3/4. Freshet line 1 meter.

5.44 River 2800 ft. wide. as we approach Point on R.B. side.

5.45 Just before reaching Point oblique suddenly to Rt. River very wide - 2800 ft. Looks like a lake still, ahead in rear.

You a league up the Lake-like, beautiful stream: farther than we will see this evening.

5.51 On L.B. 100 meters out. We will stop this evening and night at or near

Abeira do Rio,
on the beautiful ^{Convex} _{Concave}, on L.B.
It is also Concave on R.B. opposite.

on map there are some important bars in the concave on R.B. below the Rancho da Pascoa - but they are not now with.

6.02 30 meters from L.B. } River 2800 ft. wide. ^{5.5.5} _{and widening above}
clay bank on L.B. } _{clear}

6.05 30 meters from L.B. River 3000 ft. wide. _{clear}

6.07 Opp. ² Houses (marked) L.B. Freshet line 0.70 ^m River 3000 ft. wide. I. 46 1/2

6.10 Anchor - below ABEIRA do RIO.

REPORT
"Splendid Navigation - and first class piloting - from I. 54. Return night."

74] Wed. Dec. 3. I. 46½

near-(below)-Abeira do Rio.

6.55 Start - After a rainy night.

Water rose 0.16 = 0.52 feet 6" in.

at once we begin to oblique over to R.B.

[which is the reason we did not anchor higher up opp. the hamlet - a few scattered houses

7.00 4" 4.4 - as we oblique 4.4, 4.4, 4

River 3000 ft wide

7.04 About opp. the best of the 1/2 doz. houses (Abeira do Rio or Morada Beningua. as we oblique

7.07 Opp. Rancho da Pascoa - on R.B. 2 hours
The soundings all the way across 4.4, 4.4.

7.10 Within 150^m of R.B. running up.

7.13 Opp. ^{3 or 4} ~~some~~ more houses, on L.B. (Abeira do Rio)
Above these little settlements

[which have no growth perceptibly, woods on both sides of the river.

7.15 River 2500 ft. wide - in 150^m at fr. R.B.

7.20 Opp. Point on R.B. Riv 2000 ft. opp.

7.22 opp. an (apparent) lower end of a narrow island close in on L.B. It may be only a narrow bar island.

7.25 River again widens to 2500 ft.

7.27 The Map says "Pena Calcarca" on L.B. opp. here. A bar shows along the L.B. shore; but most of it, as shown on map, is submerged. Slices show it.

7.34 Map shows Rio. do Peixe, on L.B. Hidden by ^{tree} in 150^m from R.B. now. Riv. 2200 ft. (one third bar) Recent furthest line 0.80 m. ab. present river here.

7.40 - I. 46. about.

7.48 Opp. "Minor Point" on R.B. (ab. this, the R.B. has been cut by the river into a ^{or map of course} ~~channel~~ - making the river in the widest spot - 3000 ft. We oblique before we reach the Minor Point.

Wed. Dec. 3. I. 46.

75

7.59 Opp. lower point of Semi-island (name) with water 170 meters wide, to L.B. a short dis. up it is about 150 meters in dia. There is a considerable volume of water flowing through it at this time.

8.08 Opp. "Barra dos Patos" on R.B. The sand bar - is below the mouth - on the map it is above it.

8.11 Obliquing toward R.B. bar ab. on L.B. on semi-island side. At present it is an island, since water flows behind it. Map shows that in low water in 1853 - there was no water flowing behind. At the upper end the island land and the sand bar merged, and had no water.

8.16 Obliquing - nearly over to R.B. River 2000 ft. ^{bar on L.B.}

8.19 on R.B. 80 meters out. River 2500 ft. wide - ^{near up. pt. of bar.}

8.22 I see a clumpy sandy bar island ^{or near 1/2 mile} ahead - and Pilot steers toward it. River my guide I think he is going to L.B. side of it. This is new, not on the map, or rather the large bar of the map has shifted, and the channel now runs to the island.

8.31 opp. lower part of ^{said} new bar is my ^{or island.} now, and pt.

8.33 Island is cutting - where the current strikes it. We are on L.B. 40 meters out in ^{3/4} 2^{1/2} m. current. Island is very sandy, with some ^{clay and} loam 12 ft. high. Furthest line - 0.50 m. River has cut it was 2000 ft. now - 2200 - opp. Point of bar.

8.39 Opp. up. end of the (visible) mid river bar 800 ft. from L.B. 1500 ft. from R.B. But there is ^{obscure} bar, separate, about within 1000 ft. of R.B.

8.41 Opp. up. end of ^{we are obliquing to left} island - considerable volume of water now flowing in - 150 meters wide below the large bar of the map, shown here, has shifted - water has taken its place

8.48 In mid River. River 2500 ft. wide. Bar to left.

76 Wed. Dec. 3. Very Wide River!

8.52 Obliquing fr. mid river toward L.B., where channel
8.55 River 3000 ft. wide. 8.59 Breakfast Bell.
9.00 Strong Current - sandy banks cutting. Pt. of
island 1/3 mile ahead - water on L.B. side

9.07 Opp. lower pt. of Island on L.B. side
Pilot calls it Ilha da Engenho - map
give "Tapera"

9.25 Opp. stiff clay bank on R.B. - strong cur.

9.29 Freshet line 0.60^m River 2000 ft. bar
on L.B. side - or island side.

[at lower pt. of this island I could not see
whether the water behind was flowing or not.]

① This immense bar on the map, surrounds
the Ilha Engenho ["Tapera"] and extends
nearly a mile above to the L.B.
Shore; but possibly, water may be rising
through behind. I must see.

9.35 I see a large bar ahead (1/3 mile) from the
R.B. side - we oblique to Rt. pt. toward L.B.

9.40 Opp. bot. up. end of large (immense) bar on L.B.
There is a tongue of water between the bar
and L.B., but I am not sure that any
run through at this stage of the river.

L. 43 lower end.

9.48 opp Rio Pardo - 20^m wide at mouth.
Island do Rio Pardo - or its remains,
on our left. The channel is now on this,
L.B. side of the river - 1500 ft. wide.

9.58 on L.B. 30 meters or 4^m ft. 4 - woods on shore.

10.05 opp. lower pt. of new green island 1500 ft. at
the remains of island Rio do Pardo go above it.

Wed. Dec. 3. Wide River. 77

10.12 Freshet line - 0.50^m River 3000 ft. wide.

10.10 Upper end of new green island (1/3 mile long)
- 1600 ft. fr. L.B.
We run 40 meters from L.B.

Houses on R.B. ^{scattered} all along ^{8 or 10} miles
cultivation ^{common} well. ^{Settlements since} Map time.
A sand bar on R.B. running up each a
fourth of a mile above up. end of new green island.

10.15 River 3000 ft. wide.

Beautiful River ^{more than} ^{eight} ^{to} ^{leagues in}

10.20 opp. lower pt. of large sand bar on R.B. with
water behind it - whole river 3000 ft.

10.27 Map says "Pedra Calcarea", on L.B. and
"Barreira das Pedras", on L.B.

10.34 Opp. up. end of large sand bar on R.B. with
River 3000 ft. wide. ^{water behind}

10.30 Begin oblique to left - away from L.B.
Ilha dos Anjos fourth mile along
with a submerged bar outside of it.
Channel is in the oblique crossing we
now make.

The shape of the island is
much more obtuse than the map
Very pretty view up the Island Channel

10.39 opp. lower pt. of Island. (2500 ft.
from pt. of island on L.B. side across River)
shallow on outside of Island.

10.50 Say 2000 ft - narrowest part to Island -
on R.B. side - near shore.

10.52 Begin oblique from R.B. to Rt.
A tree in the water on R.B. shows that the
present river is considerably above its ordinary
stage. Freshet line 0.50^m
Behind Anjos Island map gives R.
do Bom Jesus Jardim. [Either this island
is very much longer than the map or the
upper end is "lost" into sight - while the

75] Wed. Dec. 3. - on I. 43.

11.02 Near R. B. side of island - 400^m out. Riv. 1800^{ft} ^{1.2000ft}
11.07 Very large bar on R. B. Side of the river
put out ab. here and from the channel
(a good one) on to the island when we run.

11.10 Opp. wide portion of extreme lower end of said
large bar on R. B. side. (we close in L. B. or
island, as the case may be.)

11.11 Freshet line 0.60^m ascending (10^m 10^{1/4})

Raining!

11.18 - Stiff Current - Close in Shore - 2 M. or more ^{2000ft to bar}

11.20 Begin oblique to left - away from L. B.
running nearly parallel with bar on left.
heading toward a mid-river bar. We go slow.

[Our wood is green - not fit for making
plank.] on oblique 4^{1/2} 4^{1/2} m 4^{1/2}

I. 42

11.30 Opp. up. end of Island

11.35 Opp. up. end R. B. side bar.

11.34 Opp. a mid River bar - 1000 ft. out - now
on an Rt. - we are 100 miles from R. B.
Rain is abating.

Very high banks on L. B. side of river. ^{above river} 50^{1/2}

The mid river bar just noted, merges into
an island at upper part.

This on the map - I do not see

11.51 Opp. up. end said mid river bar - island. Channel 1200^{ft}

There is a large bar on L. B. side of River
beginning about opp. up. end of island
running a mile up. - said narrow part

11.52 River 2000 ft R. B. to bar, say 1400 ft.

12.02. say 1400 ft R. B. to the bar on L. B. side

12.06 above this, the said sand bar is higher,
with patches of growth upon it.

Wed. Dec. 3. - on I. 42. = 41 + 29

12.09 Freshet line 0.50^m 1500 feet to sand-bar.
now the sand bar inclines off to Rt. to
main L. B.

12.15 Distant Mountain appears directly up
river.

12.16 Opp. "Point" of land on R. B. (shown on map)

[The bars and islands and channels have
so changed their I am at a loss to
connect the map and the river.]

(though I see no bar)
We are obliquing, now away from R. B. to Pt.

The upper end of the L. B. sand bar merges into
a sort of vasante, and then merges into
main land. River 2600 to 2800 feet.

12.22 70 meters out from said L. B. vasante, ^{run} cut
across a Concave

12.25 (may be considered abt. up. end of said vasante)

12.28 we are now obliquing toward R. B.

12.33 There appears to be nothing along here but
woods on both sides, and a fine row,
nearly 1/2 mile wide, between. I. 41.4.

We are approaching S. Jose das
Pedras dos Anglicos. on
R. B. or left-bank of River.

1.32 The river on nearing the turn narrows to
about 2000ft - opp. a point ^{as point of view} ^{of} ^{island}

1.35 opp. lower pt. of bar, on L. B. side.

1.39 100 meters from R. B. 4 to 5 meters -

1.42 Rocks - water edd. & lower extremity of Subarctic -
Party of rocks along shore at town. Rockets!

1.47 In the midst of a terrific rain storm

80 Wed. Dec. 3.

Angicos

1.50- opp. limestone bluff - 25^{to 30 ft} high - or more. Splendid rock front - Hundreds of people ducked.

1.52. Opp. the T and Chudup very heavy rain storm - Rockets!

1.54 Anchored - 3 barcas at the landing - inside of us - Landed in the midst of the storm - rockets & hundreds of people ducked and running - a most enthusiastic reception.

Angicos.

This is now the CIDADE São Francisco

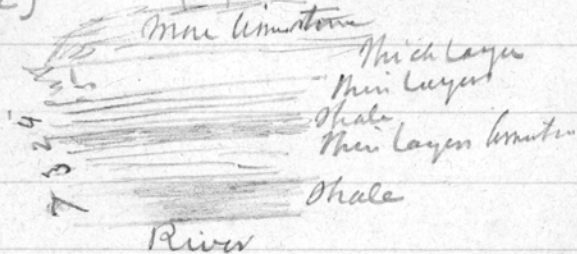
one year ago. I. 41.4. 378 houses 3 churches & a cemetery.

We went on shore, called on the new judge, who has been here only 8 days - the same who desired to come with us but fortunately did not reach Liguizique in time.

Called at the P.O. mail to learn the day after tomorrow. Mailed letters to Genl Barnard T.P.R. and M.L.R. address to Sister all & Eugénie. Left the letters to Col. J. & the enclosure to Dr P. and address to be mailed tomorrow.

Juan has more whitewashed houses than any we have seen, and a few good ones. Pop. called 2500 - It may be so, in Denton he gets 95 houses & 500 about. It has grown. At present there are 500 or so refugees here from Jamaica - (The judge said 2 or 3 thousand)

In front of Church which is 40 ft above low water.



Made arrangements to go wood here Rain at night - now rising.

See page 57. back

on Board Steamer 181
"Presidente Dantas"
"Cidade São Francisco"
Formerly "S. José das Pedras dos Angicos"
Dec. 3. 1879 (on League 41)

We arrived here about 2. P. M. to day, in the midst of a terrific rain storm, and the firing of rockets; welcoming the steamer. We learn that the "authorities" and "military force" from Jamaica arrived here, by land, this morning. We hear also, that there are many hundreds of the people of Jamaica now in this place.

Refugee leaving "Mania da Cruz", and came that the invading party had entered Jamaica, peacefully, on Sunday evening; and that the people were returning.

We have had rain two nights in succession, and to day it rained considerably. The river is rising gradually, some day; and it is a matter of some labor low water.

This makes a deep Channel at this time than exists at extreme low water. The navigation is splendid at this time.

I will gather all the information I can to enable me to refer the river to its lowest stage, and I hope to have it in my power to present a reliable account of this upper part.

There was more enthusiasm here on our arrival than on in any other place on the river.

For reasons, I have preferred to make this an unofficial letter; (although it contains some information that will be repeated in my "Whale Communications".

82) and I have taken the liberty of sending in a letter to Col. James.

We have met the new judge here. He has been here only about a week.

This Cidade is founded on a (limestone) rock; and the people have made some use of lime in white washing their Casas, than in any town on the river.

We had no difficulty in coming up the river and onto this port. On the contrary, the navigation is very fine; but it is said that there is one place below, where in extreme low water it is shallow; but I believe that this steamer can pass it, even then.

We did not succeed well in wooding, below here; and we are obliged to stop here and get some wood. The mail leaves the day after tomorrow. Your Ex.^{cy} O. S. N. Milner Roberts.

I also sent a postscript - giving substance of above - to Col. O. C. James - and also a postscript in my letter to Addis - written this evening. Dec. 3.

Thur. Dec 4. ^{Cidade} São Francisco 183

Engaged writing all day chiefly to M. read a postscript to Br. P.'s letter - also a little one to Col. J. and one to Addis.

It rained much through the day - and our wood business goes slowly, but by stopping another day in an promised a good supply.

A gentleman & wife and her five young sisters - from Jamaica called to see the steamer. All nicely dressed the nicest looking family I have seen on the river.

Had dinner
Cost - 37¢
Chinks 3
Combs

Some other gentlemen called -
It rained very long, and very hard, the night of the 4th

Halfed shows - $7\frac{1}{2}$ meters in front of Rocks.

^{Cidade} Fri. Dec. 5. S. Francisco

water rose $1\frac{1}{4}$ inches in 15 hours last night
Cloudy - very little rain to day.

Wood comes in on a mural, 400 cast - the only one I have seen in this part of valley. It holds nearly or quite 1 cord - not less than $9\frac{1}{2} \times 4 \times 126$ c. ft. - a cord is 128 c. ft.

Our little steamer is a terrible wood eater compared with the dis. she runs 130 sticks an hour - It looks like more rain to night.

It did ~~not~~ rain Friday night. Our own men made nearly 2000 sticks, here. We have now on board, say 4,000 sticks of wood, having obtained about 3400, at a cost of about 20% = 58900 per M.

84 Sat. Dec. 6th cidade Sao Francisco.

nee Argicos

River 2000 ft. wide.

River runs in 39 hours, 1^m03 = 3.38 feet.
Or at the rate of 0.088 ft. per hour - or a little
over 1 inch per hour. It is still rising.

Cloudy, cool.

9.00 Start, fairly. Hundreds of people along
the banks to see us off.

For the present (provisionary) we may
consider the water 2 1/2 miles above
low water - and rapidly rising.

L. 41 9:25 Considerable cult. on both sides - rice, ^{feats.}

9.56 opp. "Corrego do Mucamba" on R. B.
we are now just losing sight of S. Francisco.
We are 200 meters out from L. B. (Rio. 2300 ft.)
above this the river narrows some

10.15 opp. Caxocirinha - which is now overflowing
and invisible. We oblique across the river
below it, to the R. B. [Pedra (Quartzite)]
through the map shows channel on L. B.
and a Coroa, do Bom Jardim on R. B.

10.20 we are running over where the bar is marked.
Halfed gives low water Current 2.26 M. an hour
Our soundings over the bar = 10 meters. Channel here
Bom Jardim - a few scattered houses, on L. B.

L. 40. Low end.

10.38 opp. "Corrego da Iraia", on L. B. cult. ab. it.
The river along here now has the full width
of the maps - including the (conced) bars.

11.00 Very little mud of notes along here. The cur-
rent just here is about 2 1/2 miles an hour.
On map it shows 1.70 miles, (in low water).
There appears to have been no material change
in the river banks; the stream is very straight,
and ranging about half a mile wide.
Houses occur at frequent intervals, nearly all along.

11.25 a mechanical contrivance for pressing cane or
cassia beans - and a handsome corn field, on
top of a clayey bank 20 ft. ab. front water, R. B.
The tank cuts a little

Sat. Dec. 6 - on L. 40.

185

11.38 Cassia bean tree along here - 20 ft. high - on the
brow and top of steep sloping clay loam banks -
River is now a little wider in places, but no where along
here has it formed, so as to be narrower than map -

11.43 [A prominent, marked, high, steep-sloped ^{highish clay} bank on L. B.
2 miles ahead.]

11.54 [Opp. lower end of
Plein island on R. B.
Coroa do Vargem opp. map
do Canto Sapo] River half mile wide

12.18 Current strong - 2 1/2 m. an hour. along here
We crawl along - a mile an hour, or so.

The flow of the river here, to day, is not less than 600^m wide,
4^m average depth, ^{rate} 0.60 per second = 1440 C. meters per Sec -
= 50,947 C. ft. per sec = 3,056,820 C. feet per Min.

12.20 We are getting above the strong current.

12.20 Pao d'Oleo - on L. B. Treehide houses.

12.25 (about) L. 39.

Rain storm begins - short - only a few minutes -
12.39 opp. Lower end of above mentioned high clay
bank, L. B. It is yellow at bottom - mixed some
with ferruginous material - and then brownish at top.
60 ft. above low water - water being now fully 10 ft.
up. very steep slope. The rain and the river take it
away, slowly. For 200 meters along the middle it
is topped out with a dirty whitish clay mixed
with sand. The stratification is horizontal -
At one point it is quite ferruginous, near the
water. This is designated on Halfed's Map
as "Barreira do Honoria" ^{we go slowly.}
On top are bushes and very small, scattered trees.

The current along here to day is 2 miles an hour.
12.50 opp. here there is a decided ledge of mire or water.

12.57 River narrows to 1800 ft. for a short distance.
Opp. here is a submerged bar on R. B.; grass or mud
stretching up; not on map.

1.12 opp. "Sangrador" - at head of High clay bank - ^{River 2200 ft.}

1.23 - about, L. 38. ^{we stop 1.28 and get on}
2.45 START. ^{1.28 and get on}
2.57 - Rio Acary - L. B. ^{1.28 and get on}

86 Sat. Dec. 6th near Rio Acary. below

at anchor, on account of rain! **RAIN**
after stopping from 1^o 28' to 2^o 45' = 1^o 17' started
See preceding page -

3.12 opp. large bar on L. B. The lower end of
this bar toward the Rio Acary is gone -
the channel is now near there.

3.20 The rain has ceased for the present - but it
does not like cleaning up. River $\frac{1}{2}$ mile wide.
Clay high banks (25ft) and top cultivated R. B.

3.45 opp. Boa Vista and Rx^o da Boa Vista
I see one house; but a number of people at the
river to see the steamer. Houses must be back.
The large bar shown on map is invisible
as bar; but I think some of it has become
land - covered with small trees.

We are heading toward where the bar is on
the map; I therefore think that the bar is
cut away.

I see an island above, which I
suppose is the I^a das Caraibas; which
was imbedded in this large sand-bar in
Halsted's time.

In fact, we are running into the channel
between said island and R. B. - which
proves that the bar is gone - and that the
channel has taken its place.

3.52 we are close in to the R. B. shore (where the
bar used to be) in 5 meters water. **Dinner**
Bell.
I. 37 Lower end.

4.07 Saw end of island. "I. da Caraibas"
Pilot calls it "Boa Vista"
Channel 500 to 600ft wide. The R. B. is cutting

4.28 opp. low place on R. B. where 2 meters more
water would appear to run thro' (channel $\frac{1}{2}$ mile)
The island stands 25ft above low water. I judge
that it has been chiefly used as pasture - I see
no huts or people - plenty of tall grass, & many trees.

4.35 Rice Cultivation on R. B. - Channel 600 feet +
widening above here. It is cutting the island
just here, leaving with sandy strata.

4.39 opp. here is cultivation in the island - thatched
Cassava bean and sugar cane & corn.

Sat. Dec. 6th

I. 37.

87

Island Caraibas.

4.46 We begin swinging round almost at L's to
pass along head of island in a channel
between head of island and a green bar
above - a span about 100 meters wide. It
appears to be a new channel cutting

4.47 Passing the head of island, in said channel
in 6 meters water

4.48 Past head of island -

4.50 Past head of green bar - opp. to island.

We are now in main channel on L. B. side
of green bar, running up, near bar.

P. S. We could have come up on the L. B. side
of the I^a da Caraibas - the bulk of the river
is to day flowing down in that channel.
The above mentioned green bar becomes an
island farther up; there is a hut upon it, which
is now inland. It is of little account - plenty of grass.

4.51 Now obliquely to L. B. away from green bar-island.

Note that the R. B. channel, the other side of the
green bar island is now very much
clogged with sand bars visible even at
this stage of the river - at least 10ft. up.

5.02 opp. up. in green bar island - but it is all bar almost
a little way up beyond another green bar two thirds
inland - and bar opp. on the R. B. side.
In low water I should think there is no rain, then.

5.07 Now we near the beautiful, romantic shore L. B.
The trees are transcendently charming!
What a place for a glorious picnic! (only a
little over 1100 miles from the sea.) The sun con-
trasts to shine a little through its trees; but I
cannot vouch for a clear night. The contrast
of color between the bright yellow of the
splendid green foliage is beautiful!

5.11 now at the head of the 2^d green bar island; but
the submerged bar extends 200 of over 300 meters.

5.13 Cultivation on L. B. - in a clearing - once woods.
River $\frac{1}{2}$ mile wide. ^{are} in 40m. from L. B.;

5.18 but now widening away toward mid river -
5.27 still gently obliquely across - about mid river - 4 $\frac{1}{2}$ x 4 $\frac{1}{2}$

88 Sat. Dec. 6th I. 37.

5.28 Running from mid river (midwidth) to the R.B.
I see that the R.B. shows a low & cutting, now.
Cattle grazing - on what looks like short grass. This
is a sand bar formation - the old shore line is behind it.

5.33 Opp. lower pt. of Ilha da Afunda - half a
mile across the River on L.B. side - much as
it is in the map.

5.35 Afunda is in here, somewhere. See pe-
lee, and ~~the~~ thatched houses. Corn ^{manchoca}
and tall grass in large benches ^{10 ft high}.

5.40 # Capim Angola or Capivara - ^{in bank for food}
ORANGE TREES

Large, some of them full of apparently ripe
Oranges - a good, substantial house near.
afforests Palm tree - also
What luxuriant growth is here! The sandy
shore is cutting out along here; but the orange
and Palm trees are on a higher, more solid bank.

5.50 Along near R.B. shore - above when it cuts -
where the bank is lined thickly with small
trees, leaning to the water.

5.52 Inclining gently away from R.B. - but sabalo

5.52 - 2000 ft. to I. I. 36 - ^{lower end}
^{nearly mid way}
^{up island.}

6.00 River cuts the sandy bank a little along here
and lets some of the little trees fall in. [R.B. cut.
A strong current - over 2 miles an hour. 40 meters
a regular thicket of the little trees from 1 to 3 inches
in diameter 25 ft tall.]

6.09 Anchor for the night - close in to R.B. (10^m out)
150 meters below a little point, about sufficient
to keep the heavy drift stuff out of us.
The shore, just here is barely cutting - I consider it
a fairly good place in the present stage of the
river.

Seam fine navigation all day
41.40 5 ⁶/₁₀ leagues run to day -
35.80
5.6

Sun. Dec. 7th on I. 36. opp. 189

River rose last night, only ¹/₂ inch. Rain at night -
Cloudy morning

6.02 Start. -
6.08 about opp. head of I. da Afunda -
- Though a long bar indents it & extends ^{to} L.B.

6.10 We oblique from R.B. on a wide ^(¹/₂ M.) river.
[The weather threatens; but the river is beautiful.]

6.23 Came from mid-river toward River Urucua, on L.B.
no cult. in sight. We turn toward R.B. ⁴²⁴

6.44 Opp. mouth of RIO URUCUIA. 150 meters wide
It enters now nearly as in map - less down stream.
at L.B. on its right bank and slightly up stream on its
left bank - a handsome river, at this time.

6.50 We are now 30^m from R.B. shore - Chan. ^{relay camp bank}
⁴⁴
River ¹/₂ mile wide. Pine woods, R.B.

7.00 (Caus. ²⁰⁰) I. 35 - swift, smooth current.
7.00 - - - - - water very chocolatey, muddy.

7.45 Opp. a large bar, on the L.B. shore. This is
probably the Coroa do Brandao - now low and.
[The Coroa de S. Antonio of map - on L.B. which
place in map pointed is invisible. If there it is
submerged.]

8.00 Opp. (visible) upper end of "Coroa". (Rain, slightly.)
8.00 River 2200 ft. I. 34 - lower end - about.

8.30 River ¹/₂ mile wide - 8.35 opp. an ^{bluffs on L.B.}
^{mened.}
opp. an ^{mened.} ^{bluffs on L.B.} ^{mened.}

8.40 Opp. lower end of large bar on L.B. shore - much cut-
[By cutting across in here shorted the running distance]
I. 33 Provisional.

8.45 opp. Rio on R.B. (It may be S. da Varagem Azul.)

8.50 The woods become small, and the banks lower.
The country, on both sides, ^{low} behind the banks for some

8.55 Obliquing to L.B. side. (Water muddier near L.B.)
The muddier water is perhaps from the bank washings.

9.00 Now 80 meters from L.B. Strong current. The coroa da
Varagem Azul must have partly disappeared. The
Channel is in the side now. 9.06. Breakfast 1300!

I. 33
10.38 on league 32 + 0.20 league - Plain river

88 Sat. Dec. 6th I. 37.

5.28 Running from mid river (1 mile wide) to the R.B. I see that the R.B. shore is low & cutting, now. Cattle grazing - on what looks like stony grass. This is a sand bar formation - the old shore line is behind it.

5.33 Opp. lower pt. of Ilha da Afunda - half a mile across the River on L.B. side - much as it is in the map.

5.35 Afunda is, in here, somewhere. See pec-
tee, and $\frac{1}{2}$ thatched houses. Corn, *Mangrove*
and tall grass in large benches $\frac{1}{2}$ to 10 ft high.

5.40 # "Capim Angola" or Capivara - ^{can make for food}

ORANGE TREES

Large, some of them full of apparently ripe oranges - a good, substantial house near, a flowering Palm tree - also. What luxuriant growth is here! The sandy shore is cutting all along here; but the orange and Palm trees are on a higher, more solid bank.

5.50 Along near R.B. shore - abut when it cuts - where the bank is lined thickly with small trees, leaning to the water.

5.52 Inclining gently away from R.B. - but so bald

5.52 - 2000 ft. to I. I. 36 - lower end nearly mid way up island.

6.00 River cuts the sandy bank a little along here and lets some of the little trees fall in. [R.B. out. a strong current - over 2 miles an hour. 40 meters a Regular thicket of the little trees from 1 to 3 inches in diameter 25 ft tall.

6.09 Anchor for the night - close in to R.B. (10^m anch) 150 meters below a little point, about sufficient to keep the heavy drift stuff astid of us. The shore, just here is barely cutting - I consider it a fairly good place in the present stage of the river.

A fine navigation all day
41.40 5 $\frac{6}{10}$ leagues run to day -
35.80
5.6

Sun - Dec. 7th on I. 36. opp. 189

River rose last night, only $\frac{1}{2}$ inch. Rain at night - Cloudy morning

6.02 Start -
6.05 about opp. head of I. da Afunda -
- Though a long bar indents it & extends to L.B.
6.10 We oblique from R.B. on a wide $\frac{1}{2}$ M. river.

[The weather threatens; but the river is beautiful!]

6.23 Came from mid-river toward Riv. Urucua, on L.B. no cell. in sight. We turn toward R.B. $\frac{1}{2}$ M.

6.44 Opp. mouth of RIO URUCUIA. 150 meters wide. It enters now nearly as in map - less down stream. at L. on its right bank and slightly up stream on its left bank - a handsome river, at this time.

6.50 We are now 30^m from R.B. shore - Chan. here in 1852. ^{100 yd long bank.} River $\frac{1}{2}$ mile wide. Pine woods, R.B.

7.00 (Cuss. 20) I. 35 - swift, smooth current. water very chocolaty, muddy.

7.45 Opp. a large bar, on the L.B. shore. This is probably the Coroa do Brandao - nearly over and. [The Coroa de S. Antonio of map - on L.B. which place we have passed is invisible. If there it is submerged and.]

8.00 Opp. (visible) upper end of "Coroa". (Rain, slightly.)
8.00 Riv. 2200 ft. I. 34 - lower end - about.

8.30 Riv. $\frac{1}{2}$ mile wide - 8.35 opp. an ^{bluffs on L.B.} ^{island} ^{island} - we looking

8.40 Opp. lower end of large bar on L.B. shore - much cut - [By cutting across in here shortens the running distance.]
I. 33 Provisional.

8.45 opp. Rio on R.B. (It may be S. da Varagem Azul.)

8.50 The woods become small, and the banks lower. The country, on both sides, ^{low} ^{low} behind the banks for some

8.55 Obliquing to L.B. side. (Water muddier near L.B.) The muddier water is perhaps from the bank washings.

9.00 Now 80 meters from L.B. Strong current. The Coroa da Varagem Azul must have partly disappeared. The Channel is on this side now. ^{9.06. Breakfast!}

I. 33

10.38 on league 32 + 0.20 league - Plain river

92
Sun. Dec. 7. on L. 32 + 0.20 League

The sand bars toward R.B. side in the vicinity of L. 32 are gone. In fact the Channel is on R.B. now.

10.50 On R.B. 20 meters out - opp. a clearing ^(Sandy) Sillimut. R. 2000 ft

Angico Krodica tree - light col. body.
Twin woods - large trees - above and below clearing.

10.54 A grand da Minarchi Samellaria tree on the very brow of the bank - Banks are high 25 ft -

10.54 L. 32. Lower end.

11.05 São Romão in sight - $1\frac{2}{3}$ leagues above -

River has fallen - a few inches!

11.20 opp. what was a sand-bar (on map) if now seems to be connected with the main land as land. Riv. 2200 ft

11.25 River gradually widens, above. Obliquing to L.B.

The I^a de S. Romão in full view $1\frac{1}{2}$ miles - or say $\frac{1}{2}$ league ahead - dividing the river nearly equally; the wider on L.B. side presents a fine picture. The Villa is dimly seen on the right - on L.B. The Villa stands a little above the head of the island. ^{Turn here S. 5° W.}

Apparently, there is very little between here and the Villa to be specially noted.

[Bank of clayey sand - brown - yellow.]

11.35 When 100^m out from L.B. we oblique toward mid River then head for the island - to take the R.B. side

11.45 [River has fallen at least 6 inches.]

11.45 L. 31. Lower end. about.

11.54 opp. Lower point of Island: bay below is gone. We run close to point of island - ^{20 meters out} Bar is on the L.B. side of the island. Channel is the same side as when map was made: R.B.

The L.B. side was clogged with sand bars in 1853 - and it may be so yet; but they are now submerged, if they are in it still.

Island $1\frac{1}{2}$ miles long.

This channel is about 1000 ft wide. The L.B. channel is wider. Deepest appears to be near middle. 5.5 fms. The island has many trees - large and small, and some cultivation. I then + go north to the water edge to observe the view.

Sun. Dec. 7. São Romão
L. 31.

12.17 Little cove - artificial diggings on R.B. shore. Hard clay - almost red - yellowish color. Upper part of Island - in cove - 3 ft. high - later than

12.24 Town in view across head of island.

We must run above the island before turning to the town to avoid the long bar above island.

12.29 Opp. upper end of Island. also opposite the Lower end of the Villa. and Cemetery - near River. The town has rather a pretty front. The front of the white houses and the reddish yellow roofs - with green in front - and green behind make up a pleasing picture.

According to map the bar extends 1000 ft. above

12.34 Opp. Rx^o das Guaribas - on R.B. - 3 miles ^{wide} _A

12.37 Opp. upper end of best part of Villa - still running up.

12.40 Opp. extreme upper end of upper part of Villa - now we oblique toward L.B. about $\frac{1}{2}$ mile above island. and then turn - The old Pilot lands us very well.

12.48 Anchor - Engineer is not well - and I decide that we may as well stop for the day as we must spend some time.

Villa de São Romão, ou
Villa Risenha de São Romão.

on the left bank, at League 30 + $\frac{1}{6}$ of a league

It looks ^{very} from across the river, as we approached from the opposite side of the island, by the regular channel (though I have no doubt that at this stage of the river we could have come up on the left bank channel of the Island.)

Soon after anchoring we went on shore and viewed the town. It has a very good, nearly finished Municipal Hall and

92] Dec 7th

São Romão.

Jail built of stone and brick - which has been
looted 18 years; but is only now being finished.
This was, but is not a Villa. That title was
transferred to Angeicos - now São Francisco

The houses in São Romão, are pretty gene-
rally white washed, though, as usual
there are many of "wallies and dabs."
The grade portion an elevated above the
floods. We visited the Church - which
I was surprised to hear is only 18 years
old. It looks ancient enough to be the grand
father of 18 years. They stand as the
wonderful figures, &c -

There was service in the Church when
we arrived - which they say, proved us
promising seed with rodents.

We see orange trees and banana
trees bearing fruit in gardens without ir-
rigation - above the floods. We had
rain within an hour after our arrival;
and it has rained all the afternoon.

Six of our crew, including the
Engineer, are sick to day - Mr. Saboria
is a little better. I have then better
in the Cabin with me now. My old
Indian friend got well.

I cannot tell the Comoros Mon-
ing how these sicknesses may affect our
movements. I pray that it may not
rain hard to night.

The river is about a $\frac{1}{2}$ mile wide here.
6 $\frac{1}{2}$ P. M.

Page 235, Vol II. Burton

The direct dis. betⁿ Rio and Sabará,
is 30° 12' 39" or 192 geoq. miles, and the usual
calcⁿ for length of railway is 276 miles.

xx For Steam Navigation down the
Rio Das Velhas 366 miles - and down the
Rio de São Francisco to Villa Boa Vista
792 miles, perfectly clear, save at one
point. Boa Vista to the Porto das
Piranhas - railway or tramway 216 miles
Piranhas to mouth of S.F. 129 miles,
in S. Lat. 10° 27' 4" and W. Lon. 36° 21' 41"
from Greenwich.

Page 237.

"Cabeça acima" gang up stream.
"Navegar cabeça abaixo" - down stream.
"Travessia" or trip - begins normally at
Pirapora - some 30 leagues. Boatmen when
entering the stream under difficulties call it a
"Travessa Graba".

The extreme upper
part of the main São Francisco - according
to Burton averages approx 1200 ft. in places
evident to 4500 ft. - Height of banks 25 to 36 ft.

xx The supply of wood will last for
years, but the vegetation is uninteresting after
the magnif. avenues of the Rio das Velhas.

P. 204 of Buftm Vol. 2
High - Rio de São Francisco - Ext. up.

Carca d'Anta - Falls at upper end.

Pirapora - (Fish-leap) - 5 leagues
above junction. * River 700 average

[Time of visit, about latter part of September]

A true fall - in two sections

M. Dias makes length 1 kilometre - Fall 3.55 = 10.02

(Dunbar says this sum 3 to 4 metres per second)

Dias proposed canal - Halfed, Slevia gates.

Rock of hard compact gneiss (granular sandstone,
microcratic) of light purple tinge, dotted with specks
of mica glistening white. also sandstone & impure
Calcareous

2 main steps, separated by about 700 yds

The upper rapids 6 ft. second more formidable than

the lower rapids 7 ft. (Detach. 13 ft) between smoothies.

Near the right bank there are Catadupas, or true falls.

They are garnished with escadarias (little lodges).

The river above the break is 1500 ft wide

at the Porto da Pirapora - it is 3500 -

clearing the dries - the fair way, is a thin sheet of water
near the western bank. - of course cannot pass. Canoes
must be unloaded.

" above it also the Rio S. J. becomes
a mass of rapids, and when you clear one you are
within hearing of another.

Page 206

In July 1867, a white squall of the thickest possible den-
sity carried off the cables from the rope of Guaicuary.

Dis. from mouth to Pirapora "is said to be 5 leagues. If so
each league must represent 6 1/2 geog. miles" of here -

Break now at its worst

Page 216

Main source in the eastern summit of the Serra da Canastra.
The great central plateau of Minas Geraes between
S. Lat. 20 and 20° 30' and W. Lon. 3° (from Rio de Janeiro)

Carca d'Anta Cascade 667 feet

Riv. W to E 55 1/2 leagues - near Mt. Toronto - Above the

Paraopeba - breadth 140 miles - Max depth 3 m 25

Discharge 1300 c. m. per second

From the Paraopeba to Pirapora Rapids. surveyed. the
distance 40.8 geog. leagues (226,845 m)

Dias says: Source to Junction 800 Kil. = 500 miles. Mouth to Mouth
2100 Kil. = 1300 miles

Page 186. Vol. 11 - Buftm - Post Vila -

(Local Squares)

* M. Dias gives 167 m (547,76 ft) width of the Das Velhas -
discharges 209 c. m. per second. 2365 ^(Palmas) or 567 m
(Gulbor) or 432 (Dias, at the Confluence) I made the Manga
1774 ft. high (B.P. 209° 40' temp 45°)

Before the confluence the São Francisco is 359 m broad
(more than doubling D.V.) and the discharge 446 c. m.
Total 655 c. m.

Barra or mouth of the Das Velhas 17° 11' 54". Lon. 1.43 35
from Rio de Janeiro.

Rio de Janeiro - Barbacena and Sabará - nearly
in a line or gentle arc.

Direct line Rio to Mt. of Das Velhas only 3800 miles (1/2
a league) 1/2 of total dis. 656 Kilometres = 385 geo.
miles, or 5° 55' 31" = 656 Kil. = 400 Eng. miles

Page 188.

If any place bears the stamp of a quaternary affixed
by Water's hand, it is this junction. It is the half-
way house on the mighty mining valley; it has, of
course, it can have [rather] water traffic with Sab-
ará, Diamantina, Civello, Petangui, Pará (or
Patafugio) Dões de Indaia, Campos Grande, Para-
catu, São Romão and the other mining settlements on
the São Francisco river. It links together

the provinces of Goyas, Pernambuco, Bahia,
and Minas, [that is, it does nothing of the
sort; but it answers as a figurative point from
which Dunbar drew the above figure] and be-
fore many years the steamer and the rail-
way will connect it with the Capital of the
Empire. [This latter part is scribble & true.]

Page 189

In early colonial times the Junction and settle-
ment = Barra de Guaicury - formed an old
Fulgado, or Chief-lieu de Justice, which at
50 years ago x x District + Municipality created
in 1861 - by taking in part of Montes Claros, São
Romão, Paracatu, Civello, and Diamantina
principal town took name Villa de Guaicury.

Affairs annexed Murumbuca and the new districts
of Extrema, Pirapora, and São Gonçalo das Taboas;
and now it is divided into 4 - Guaicury, São
Gonçalo, Pirapora, and Extrema. Pop. 15,000
1200 voters - 17 electors. The settlement is

divided into two Bairros, or Quarters. Near the confluence in the (Arraial do) Manga or the Cattle-ford, popularly called the Port. The upper village is the Villa, formerly the Arraial da Porteira. The Municipality has a single parish, the "Freguesia de N.ª S.ª de Bom Sucesso e Almas da Villa de Guaiatubá".

The Manga is a wretched decaying village. The rise of the river is here - 35 to 36 ft. Houses show a water mark of 6 ft.

Purton's succinct description of the houses is good. "These lodgings contrast badly in comfort with Dahome, or Abeokuta, in Egba-land: they are unwhitewashed cages of wattle and daub, roofed with half-baked tiles. All have ground-floors of tamped earth, except the Sobradinho, belonging to Sr. João Pereira do Carmo, merchant, and Juiz de Paz. Most of the houses have back yards green with banana trees, cucumbers or Calabash trees, and oranges, which are exported down stream. The settlement abounds in Manioc.

Page 185 - A Remark "after a few days of traveller's life and liberty, of existence in the open air, of sleep under the soft blue skies, of days without neck-ties, the sensation of returning to "Society" is by no means pleasant."

Page 238
 M. Dumont. Steam contract 1867 - 2 passages per month on the Darvelhas, - from Sabará - 10 leagues per day - Passage 18 per league [enormous] and for goods 0\$100 (one hundred reis per L. per arroba). Stream to be reformed between Sabará & Jaguara according to the plan of M. de A. Bet. Sabará and Jaguara, 20 leagues - the charge would be for 1 passage 20\$000 - and for 1 arroba (32 lbs) 2\$000. A mule will take 6 arrobas for 4\$000. or 0\$666 per arroba. A sailing-boat (2 ft 1.8 inches) 10 men x 8 hours, 15 days bet. Sabará and the M. 4000 arrobas (500 to 60 tons) or 340 miles, 42 men in 36 days ascent of boat with the time and double the crew, and a

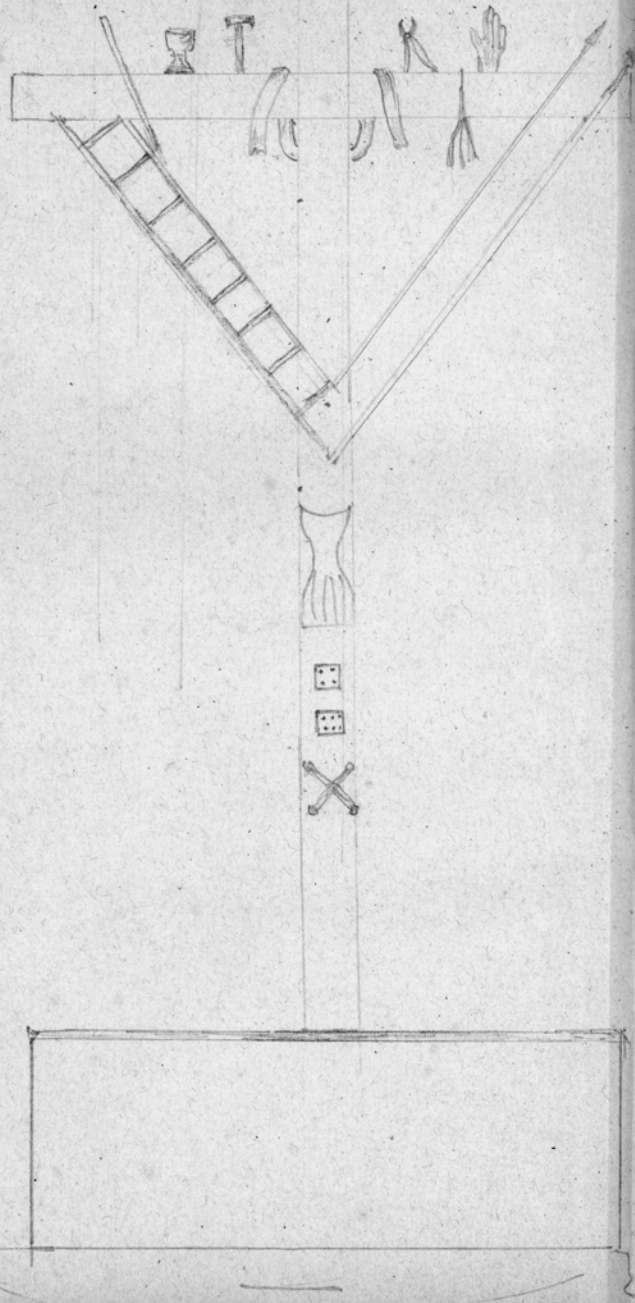
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Nothing could more clearly or more forcibly exhibit the actual status of matters in the San Francisco valley than the recent events connected with the Villa of Jarumã. The largest town on the river. A dispute, between some one exercising legal authority, and an individual, who alleged that injustice had been done to him by the action of the official person. Suppose this allegation to be true. The individual then abroad, proceeds to raise a force of men for the purpose of ousting and punishing the legal personage; and either by actual force of arms, or by strategy backed by a certain force of arms, creates a general alarm, and a city containing five thousand inhabitants is abandoned by four fifths of the people, including most of the merchants and its business entirely prostrated. Not only that, other towns, in both directions along the river, who were alarmed at the condition of affairs, abandoned the town and fled to the woods. Then followed a trifling skirmish between the military force of the Villa of Jarumã and the private force of the individual, in which two or three were killed or wounded. Finally the authorities and the troops desert the town and fly to another town ten miles up the river, while the private force of the individual was quartered at another town thirty miles down the river. There after remaining a few days the authorities and military force were seized with a panic and ^{as} hastily as the Children of Israel bundled up and departed to another town still farther up the river. In a few days after the official destruction of Jarumã the individual entered and took possession of the place.

Cross in the Cidade
S^o Francisco.

on League 41.

Dec-3-1879.



Rio Unacua 36th League - Left bank.
Paracatu 25th " " "

14,000

2500

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32 56,200 4620

32 56,200 1962

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32 56,200 650

32 56,200 1000

32 56,200 1600

32 56,200 284

32 56,200 110

328

35

1840

284

110