



RECEIVED
COAST AND
GEODETIC SURVEY

2676

Diag. Cht. No. 901-f

JUL 25 11 09 AM 1904

2678 & 2680

DEPT. OF COMMERCE
BUREAU OF COAST AND GEODETIC SURVEY

U.S. COAST & G. SURVEY
LIBRARY AND ARCHIVES

JUL 25 1904

Acc. No. 2676
2678
2680

O. H. Tittmann, Supt.

State: Porto Rico.

DESCRIPTIVE REPORT

Hydrographic Sheets Nos. { 2676
2678
2680

LOCALITY:

West Coast of Porto Rico.

1904

CHIEF OF PARTY:

P. A. Welker, Assistant.

2676/2678
2678
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2676 x
2676
2678
2680
attached

H03006

H03004 H03005

POST-OFFICE ADDRESS: See address at office.

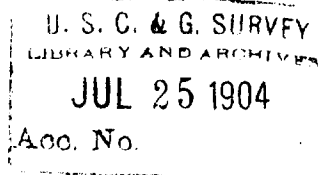
TELEGRAPH ADDRESS:

EXPRESS OFFICE:

U. S. COAST AND GEODETIC SURVEY. Str. "Bache",
Baltimore, Maryland,

July 18th, 1904.

Mr. O. H. Tittmann,
Superintendent, Coast and Geodetic Survey,
Washington, D. C.



S i r :-

In obedience to Instructions and Memoranda for Descriptive Reports, 1887, I have the honor to submit the following report on Hydrographic Sheets Nos. 2676, 2678, and 2680:

2. The work was executed for the purpose of developing the channels and reefs, and locating the dangers to navigation in the waters adjacent to the west coast of Porto Rico, between Mayaguez and Cape Rojo.

3. A portion of this region has already been described in my report of June 30th. 1903, upon hydrographic sheets Nos. 2632, 2633 and 2640, and this should be considered in connection and supplemental to the same.

4. The most important part of the work consists of the development of the channel through the extensive reefs upon the west coast, close to shore, from a point abreast of Mayaguez to Cape Rojo, and the nature of, and extent of the reefs and shoals to the deep water to the westward, including Tourmaline Reef, Media Luna and Gallardo Banks.

5. For the purpose of developing the channel close to shore and through the reefs, from a point abreast of Mayaguez to Cape Rojo, a system of lines was run approximately parallel to the axis, at a distance of from 25 to 75 metres apart, and swept by a drag set to a depth of 3 fathoms. All spots showing indications of shoals or obstructions were carefully developed. Without doubt, an excellent and safe channel for three fathoms depth was located.

6. The region to the west of Tourmaline and Media Luna reefs and Gallardo Bank is quite flat, with the exception of a ridge or bank close to the edge of the same, where there are numerous shoal spots, with from 25 to 35 feet of water over them. This region was carefully sounded and run over with the steamer, with the drag set to 27 feet. The change from deep to shoal water is very sudden and the edge of the bank is very steep. Vessels of over 24 feet draught in rounding Cape Rojo, bound to the northward, should not pass inside of the 100 fathom curve until after Buena Vista Peak bears east. In many cases the change from 100 fathoms depth to 4 or 5 fathoms is obtained within a distance of not more than one quarter of a mile. The limit in this locality for safe navigation for vessels drawing over 24 feet, is the 100 fathom curve.

7. Currents of considerable force are encountered in close vicinity to the reefs and shoal spots, their direction being uncertain, as they are in the nature of swirls, and probably

(3)

depend upon the stage of the tide.

8. The lead gives no indication of the approach to the extensive shoals off the west coast of Porto Rico and the region should be navigated with great care.

9. The general characteristic of the bottom in this region is of a fine white sand interspersed with reefs of rocks and coral. The water is very clear and upon a bright day the shoal spots can be seen, but it is not always safe to depend upon this on account of the prevailing cloudy weather and the numerous shadows cast by the clouds.

10. For a detailed description of the surrounding country and further general information, attention is invited to my Descriptive Report of June 30th., 1903, upon Hydrographic Sheets Nos. 2632, 2633 and 2640.

Very respectfully,

P. A. Walker

Assistant, C. & G. Survey,
Commanding.

2676X

C. & G. SURVEY,
LIBRARY AND ARCHIVES

SEP 28 1909

Acc No.

DEPARTMENT OF COMMERCE AND LABOR

COAST AND GEODETIC SURVEY.

O. H. FITTMANN, SUPERINTENDENT.

S. W. Coast of Porto Rico.

C. & G. S. S. "BACHE".

W. O. Hodgkins Chief of Party.

Began April 17, 1909.

Ended April 8, 1909.

Scale 1:100000.

Positions plotted by Wm. Sanger.

Soundings plotted by Wm. Sanger.

C. & G. SURVEY,
LIBRARY AND ARCHIVES
SEP 28 1909
Acc No.

2676 X

STATISTICS. SHEET " B ".

<u>Date.</u>	<u>Letter.</u>	<u>Vol.</u>	<u>Angles.</u>	<u>Soundings.</u>	<u>Miles.</u>	<u>Boat.</u>
1909.						
April 7.	B	6	8	4	1.0	Steamer "BACHE".
" 8.	C	6	20	10	3.5	" "
TOTAL.2	2	1	28	14	4.5	" "

V.E.C.
Nov.13,1909.

HYDROGRAPHIC SHEET NO. 2676 X.

S.W. coast of Porto Rico, by Assistant
W.C.Hodgkins in 1909.

TIDES.

Mean rise and fall of tides 1.0 ft.

Soundings were used without reduction for tides.

~~Coast and Geodetic Survey~~

NOV 13 1909

TIDAL OBSERVANCE

Exp Sheet 2676⁸

Nov 30 1909

The plotting of the work has been verified
and found correct.

The records were well kept.

H. L. Simmons

2678

Diag. Cht. No. 901-1

Form 504 U. S. COAST AND GEODETIC SURVEY DEPARTMENT OF COMMERCE DESCRIPTIVE REPORT	
Type of Survey <i>Hyd. Puerto Rico</i>	
Field No.	Office No. <i>2678</i>
LOCALITY	
State <i>P.R.</i>	
General locality <i>Sec 2676</i>	
Locality	
<hr/> 194	
CHIEF OF PARTY	
<i>P. A. Welker</i>	
LIBRARY & ARCHIVES	
DATE	

2678

2678

U.S. DEPARTMENT OF COMMERCE
LIBRARY AND ARCHIVES

83
SHA
2678

Department of Commerce and Labor
COAST AND GEODETIC SURVEY

O. H. Tittmann
Superintendent.

State: *P.R.*

DESCRIPTIVE REPORT.

Hyd C Sheet No. *2678*

LOCALITY:

See

2676

1904

CHIEF OF PARTY:

P. A. Welker

8292

INDORSEMENT.

Department of Commerce and Labor

COAST AND GEODETIC SURVEY

Washington, May 4, 1905

Respectfully { returned
referred } to Mr. [unclear]
forwarded

11-767

This lost line seems
to be an expert opinion.
If it is true we had better
give up Hydrography
H.C.P.

M Bradford

Report
on
Hydrographic Sheet
No. 2678.
West Coast of Porto Rico,
Mayaguez Bay to Cape Rojo,
P. R.
Assistants Welker and Boutelle,
1904.

When drag was used the position numbers are underlined with colored ink. Red shows drag set at 18 ft. and green at 20 ft.

ON ORIGINAL DOCUMENT

The drag was used on all days from A to H with the exception of R day, from position 42 to 58, and on G day from position 33 to 86 where the drag was set at 20 ft. sounding

Between positions 52 and 53 B the records show a sounding of 14 ft. but the drag set at 18 ft. did not touch. This is no doubt an error of 3 fathoms and was plotted as 22 ft. by field party.

x (not? 42)

The sounding of 29 ft. northeast of R.H. Buoy #2 about 300 meters was plotted with a question mark as recorded.

ON ORIGINAL DOCUMENT

The 13 ft. spot east of "Join" shown on Hyd. Sheet 2536 was swept with drag set at 18 and 20 ft. The least water found here was 23-1/2 ft. In this work and that transferred from Hyd. Sheet 2536 there is an average difference in the crossings of about 2 ft. which is probably due to a difference in the lead lines.

Hyd Sheet

ON ORIGINAL DOCUMENT

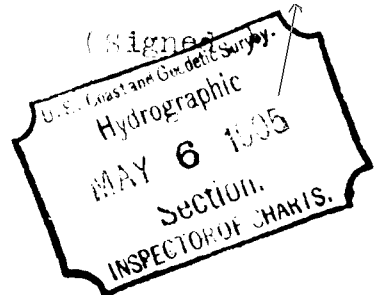
The records were well kept.

H. L. Simons.

(Signed)

I have noted on the sheet in pencil that these spots should be omitted in the reduction

Sp. 3. 8. 05



2680

COAST AND GEODETIC SURVEY
LIBRARY AND ARCHIVES

Diag. Cht. No. 901-1

83
SHA
2680

Department of Commerce and Labor
COAST AND GEODETIC SURVEY

O. H. Tuttleman

Superintendent.

State: *PR*

DESCRIPTIVE REPORT.

San Juan Bay

Hyl. c Sheet No. *2680*

LOCALITY:

See

2676

1904

CHIEF OF PARTY:

P. A. Welker

2680

Tim Bradford

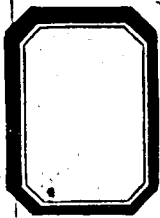
Report
on
Hydrographic Sheet
No. 2680,
West Coast of Porto Rico,
Point Guanajibo to Point Guaniquilla,
P. R.
Assistant Welker,
1904.

The soundings were well plotted and the records well kept.

Soundings in red were transferred from Hyd. Sheets 2536 and 2537.

H. L. Simons. (Signed).

U. S. Coast and Geodetic Survey.
Hydrographic
JUN 15 1905
SECTION.
INSPECTOR OF CHARTS.



2676^x, 3004
3005, 3006.

LIBRARY & RECORDS DIVISION
SEP 28 1906
Ap No

2676 3004 3005
3006

3006

Department of Commerce and Labor
COAST AND GEODETIC SURVEY

Superintendent.

State: _____

DESCRIPTIVE REPORT.

Hyd. C. Sheet No. ³⁰⁰⁴₃₀₀₅ ³⁰⁰⁶_{2676^x}

LOCALITY:

190

CHIEF OF PARTY:

3004 3005 3006

3004, 3005, & 3006.

Diag. Cht. No. 901-1



Filed with

Department of Commerce and Labor
 COAST AND GEODETIC SURVEY

 Superintendent.

State: _____

DESCRIPTIVE REPORT.

Hyd S Sheet No. *2676*

LOCALITY:

 190

CHIEF OF PARTY:

B

Library and Archives
COAST AND
GEODETTIC SURVEY

SEP 26 1909

REFERRED TO:

~~Assistant in Charge.~~

DESCRIPTIVE REPORT

To accompany Hydrographic Sheet No. 9

MONA PASSAGE, WEST INDIES.

Scale 1:100000.

C. & G. SURVEY,
LIBRARY AND ARCHIVES
SEP 28 1909
Acc No.

surveyed in the months of February, March, April and May, 1909.

by the party on the Steamer Bache commanded by

Assistant W. C. Hodgkins.

This descriptive report covers also the work shown on three sub-sheets:-
one, on the same scale, showing a few soundings to the southward of Cabo Rojo;
one on scale 1:20000, of the immediate vicinity of the islands of Mona and
Monito; and one, a copy of Mercator Chart, C. & G. S. No. 920, showing a few
deep soundings on the north coast of Porto Rico.

The work shown on this sheet covers the deep water of the Mona Passage,
the extensive shoals which stretch westward from the Porto Rican coast to the
southward of Point Jiguero having been previously surveyed. While the depths
throughout this area range, in ^a general way, from 200 to 500 fathoms, a few
spots were found having less than 100 fathoms. On the other hand, the depths
rapidly increase in going north from the vicinity of Desecheo Island or south
from Mona Island.

In the immediate vicinity of Desecheo and Mona Islands the curve of 100
fathoms depth was found to extend in some places to a moderate distance from
the shore but no dangers to navigation were discovered other than the fringing
coral reefs which parallel a considerable part of the shore of Mona Island and
some rocks extending short distances from the shore of Desecheo. All of these
are well out of the way of anyone keeping half a mile off shore and a large
part of the shore of the islands is so bold that if there were no swell, large
vessels could moor alongside the rocks.

DESCRIPTIVE REPORT. No. 2.

Owing to the considerable depth of the water, it was impossible, in general, to take soundings while running. The soundings had to be taken with the Sigbee machine, the ship being stopped for each sounding. Whenever possible, the position of each sounding was independently located by angles on shore objects. On account of the great distance from shore it was generally impossible to see ordinary signals or even such larger objects as lighthouses and other buildings and observations were therefore made upon hill tops when they were visible, which unfortunately was not always the case.

The meteorological conditions at the western end of Porto Rico were usually unfavorable for the purposes of the survey. In the morning, when the sea was usually more quiet than later in the day, the sun was directly behind the hills to be observed upon and the whole island was usually wrapped in a misty veil through which the hill tops showed, if at all, as mere shadows very difficult to catch in the sextant glasses.

In the afternoon, when the position of the sun was more favorable and better seeing might reasonably be expected, rainstorms usually chased each other across the hills, completely blotting out one or another of the desired marks. Besides this trouble, the wind and sea usually increased during the day to such an extent that sounding had to ^{be} stopped early in the afternoon on account of the danger of damaging the sounding machine and the difficulty of getting up and down casts.

The correct location of positions by dead reckoning was found to be very difficult owing to the strong and irregular currents which were encountered. Efforts were made to allow for the effect of the current by locating the position of the ship at intervals before getting out of the range of visibility of the hill tops used as signals and thus learning the course made good with the given compass heading. This method seemed at times to work very well for distances of a few miles, but when the line had to be continued for several hours, a very different set of the current was pretty certain to be encountered.

DESCRIPTIVE REPORT. No. 3.

It was sometimes possible to check the western end of a line by observations on Mona or Monito, but sometimes the only way of checking the positions was by the run back to the starting point and that was not always satisfactory.

These difficulties of location will serve to explain the somewhat irregular distribution of soundings in the area surveyed. When a sounding of less than 150 fathoms was obtained, an effort was made to develop the vicinity sufficiently to be sure that no very shoal spot should escape discovery and special soundings were made in places where tide rips or eddies were noticed. On the other hand, when soundings within a given area ranged from 200 to 500 fathoms or more the sounding lines were spaced more widely, to permit more time to be put upon the shoaler areas.

For the inshore work at Mona and Desecheo Islands the launch and whaleboat were used and the soundings were made with the hand lead. Tidal observations were made at Mona Island while the inshore work was in progress but no such observations were made in connection with the ship work in the Mona Passage.

It is believed that the information obtained is ample for all purposes of cartography and navigation of the Mona Passage, unless at some future time an unexpected development of the resources of Mona Island should make it desirable to have a closer survey of the inshore hydrography. I consider that contingency very unlikely.

The Mona Passage is one of the principal avenues of communication between the Atlantic and the Caribbean and it is therefore a matter of congratulation that it is so free from dangers, if the coast of Porto Rico is not too closely approached. On the East Cape of Mona Island is an excellent light which serves as a guide for vessels making the passage, but it is unfortunate that the height of the tower is insufficient to allow the light to show over the slightly rising ground to the northwestward and westward, so that it is useful only to vessels passing eastward of Mona Island.

DESCRIPTIVE REPORT. No. 4.

With the increasing use of the passage which may reasonably be expected, it will probably be found necessary either to give a greater elevation to that light or to establish a new light at the western end of the island.

Mona is a table island, appearing almost flat on top when seen from certain directions, although its surface is actually somewhat rolling. On the north and east sides of the island vertical cliffs rise directly from the sea to the edge of the table land and descend below the surface to depths of apparently ten fathoms or more. There are no landings along that stretch of coast and no regular anchorages although the Bache on one occasion anchored for the night in the bight on the north side of the island. The upper part of the island seems to be composed of a thin layer of hard rock of a dark color, below which the cliffs are lighter colored and show many caverns, which are the resort of large numbers of sea birds and also of bats, if my information was correct.

Along the southern and western sides of the island the cliffs have partly fallen away into steep, wooded slopes and the shore has built out from the base of the cliffs, forming strips of flat land, covered for the most part with dense bushes. The strip of low land at Playa Pájaro on the southeastern side of the island is narrow and not very long, the cliffs, here considerably lower, protruding again to the sea in the vicinity of the curiously shaped rock called Caigo-o-no-Caigo. To the westward of that point the strip of low land is wider until West Point is reached. To the northward of that point the beach rapidly narrows, until it loses itself in the cliffs at Cape Barrio nuevo.

The cliffs behind the low land likewise contain many caves, in which extensive deposits of guano have been found. For a number of years these deposits were worked and traces of those operations are still visible though nothing has been done there for some years.

The entire top of the island is covered by a dense growth of cactus and scrub, in which live numerous wild goats, pigs, and cattle. Monkeys seem to be unknown, notwithstanding the suggestive name of the island.

DESCRIPTIVE REPORT. No. 5.

The only permanent inhabitants of the island are the Keepers at the light station and a few other other persons at Playa Pajaro. During the season for catching sea turtles there is a camp at the western end of the island, north of West Point.

Anchorage may be made almost anywhere if the depth is suitable and the sea not too heavy. The charts designate by name four anchorages:- Playa Pajaro, Ubera, Isabela or Playazo, and Sardinero. With the ordinary conditions, the latter is the only one which affords much shelter from the swell, some of which always works around even into that road. Sardinero Anchorage has a boat landing which is well sheltered by a coral reef, through which there are two or three passages. The lagoon within the reef is shallow, but no trouble was found in landing there, unless the swell was unusually heavy. The landing at Isabela Anchorage is unprotected and is therefore apt to be bad. Ubera was not used by the party on the Bache but seems to have a fairly well sheltered boat landing. The wreck of a large iron ship lies on the reef in this bight.

The landing at Playa Pajaro is the one most frequently used, being the landing for the light house and having the only settlement. The anchorage is generally uncomfortable, as the swell sets in strongly and the tidal currents run with considerable force along shore. From the ship in the offing, the landing looks uninviting, but in spite of that appearance it seems perfectly safe in any ordinary sea, that is in a sea which will permit a boat to be lowered alongside or when the sea does not break across the passage.

The coral reef off this beach encloses a larger and deeper lagoon than those at the other landings and this lagoon seems to be well sheltered from the swell by the reef. There are two principal passages through the reef, which are indicated by range poles set up on the beach in such a way that with the poles in one, a boat will be in the best water. The marked passage at the southwestern part of the lagoon is the better one to use, the poles at the northeastern passage being out of repair and the passage itself being apparently inferior.

DESCRIPTIVE REPORT. No. 6.

Shoal ground seems to extend seaward for some little distance from the middle of this reef and it will be prudent for a vessel approaching the anchorage not to get into less than ten fathoms until the range poles are picked up, when one may run in slowly with the lead going and anchor in eight fathoms, or less if desired.

At all of the anchorages, the bottom is hard, white sand with scattered patches of rock which show dark as they are approached. It is always easy to select by the eye a patch of clear sand in which to let go anchor.

Monito Island is very small and closely resembles the northern part of Mona. It has deep water all around it, with no beach whatever and is almost inaccessible. Landing was made upon a tongue of rock which projected like a bracket from the face of the cliff on the western side of the islet and about four feet above the surface of the water. This islet also has several caves and is almost covered with sea birds and their nests. There is a good deal of cactus and scrub on top of the island. The surface is rather irregular and the northeastern point is the highest part.

Desecheo Island is very different in appearance and formation from Mona and Monito. It is mountainous, rising in steep, bushy slopes to a ridge having three summits, the most northern of which is the highest. The shore is rocky, with a few very short bits of beach. A rocky spit extends from the western point of the island and a few rocks lie off the eastern point. There are no very good landings but in quiet weather no great difficulty was found in landing at various points around the island. There is no sheltered anchorage but the Bache anchored temporarily at several different places, finding hard sand bottom.

Respectfully submitted,

W. C. Hodgkins

Assistant.

To the Superintendent,
Coast and Geodetic Survey,
Washington, D. C.

Addendum.

It occurs to me that it may be well to add a few words in regard to the platting of positions on these sheets, as in places they are somewhat interwoven and without an explanation there might be some difficulty in understanding the work.

No difficulty should be found with the main sheet of the Mona Passage; but in the vicinity of Mona Island it was sometimes necessary, on account of the signals used, to plat positions on the main sheet instead of on the sub-sheet on 1:20000, causing some breaks in the continuity of lines on the latter sheet.

Also, when working on the northern edge of the bank northwest of Point Borinquen, a few positions fell off the edge of the main sheet and were platted on Original Hydrographic Sheet 2938^a.

W. C. Hodgkins

3004
1909

STATISTICS. SHEET NO. 9^B

Date.	Letter.	Vol.	Angles	Posi- tions	Soundings.	Miles.	Vessel.
1909.							
May 26.	a	1	110	55	401	12.0	Launch No. 32.
" 27.	b	1	242	121	660	21.0	" "
" 28	c	2	196	98	545	15.5	" "
TOTAL.	3	2	548	274	1606	48.5	Launch No. 32.
Aprl. 23.	H'	7	20	10	10	8.0	Str. "BACHE".
" 30.	M'	8	20	10	10	10.8	" "
May 8.	P'	9	8	4	4	5.7	" "
" 11	Q'	9	4	2	2	2.3	" "
" 12	R'	9	6	3	3	1.7	" "
" 13	S'	9	8	4	4	5.1	" "
" 14	T'	9	82	41	41	21.0	" "
" 15	U'	10	38	19	19	11.4	" "
" 18	V'	10	52	28	87	9.4	" "
" 27	Z'	10	14	7	7	4.0	" "
" 28	A"	10	56	28	28	7.5	" "
" 28	A"	11	40	20	20	25.5	" "
" 29	B"	11	16	8	8	5.7	" "
TOTAL.	11	6	364	184	497	125.5	Str. "BACHE".
May 17.	3a	1	166	83	254	7.4	Whaleboat.
RECAPITULATION.							
Launch. No. 32.	3	2	548	274	1606	48.5	
Str. "BACHE".	11	6	364	184	497	125.5	
Whaleboat.	1	1	166	83	254	7.4	
GRAND TOTAL.	14	9	1078	541	2357	181.4	

Mar 30 W 5 4 2 2

Hyattsville No 3004

Nov. 30, 1909

The ground within the limits of the survey is well covered with the exception of the area within the 20 fath curve, off Monte Id and off the north and east shore of Monte Id, which has not been completed.

The remainder was done and well kept and the survey is finished.

H. R. Simmons

3005

SEP 28 1909
 Ass. No.

STATISTICS SHEET NO. 9

Date	Letter	Vol.	Angles	Soundings	Miles	Boat
1909.						
Feb. 18.	A	1	10	5	18.0	Str. RACHE.
" 20.	B	1	22	11	14.3	" "
" 23.	C	1	18	9	12.5	" "
" 24.	D	1	36	18	22.3	" "
" 25.	E	1	38	19	28.00	" "
" 26.	F	1	44	22	24.00	" "
Mar. 5.	G	1	12	6	6.0	" "
" 5.	G	2	36	18	42.0	" "
" 6.	H	2	14	7	23.00	" "
" 8.	I	2	26	13	29.7	" "
" 9.	J	2	26	13	26.3	" "
" 10.	K	2	14	7	12.6	" "
" 11.	L	2	44	22	29.7	" "
" 15.	M	3	16	8	21.7	" "
" 16.	N	3	26	13	21.7	" "
" 17.	O	3	24	12	19.4	" "
" 18.	P	3	92	46	35.4	" "
" 19.	Q	4	58	29	34.3	" "
" 22.	R	4	46	23	40.0	" "
" 23.	S	4	8	4	14.3	" "
" 25.	T	4	38	19	24.0	" "
" 27.	U	4	14	7	7.0	" "
" 29.	V	5	34	17	26.3	" "
" 30.	W	5	16	8	20.6	" "
" 31.	X	5	46	23	28.6	" " ***
Apr. 1.	Y	5	48	24	35.4	" "
" 2.	Z	5	22	11	7.0	" "
" 5.	A'	6	46	23	21.5	" "
" 5.	A'	6	36	18	42.3	" "
" 12.	D'	6	14	7	13.7	" "
" 19.	E'	6	32	16	42.8	" "
" 20.	F'	6	24	12	22.9	" "
" 21.	G'	7	46	23	48.0	" "
" 23.	H'	7	26	13	35.1	" "
" 24.	I'	7	12	6	17.1	" "
" 26.	J'	7	50	25	59.4	" "
" 27.	K'	7	30	15	26.3	" "
" 27.	K'	8	24	12	33.1	" "
" 28.	L'	8	38	19	11.4	" " **
" 29.	M'	8	50	25	54.3	" " **
May 7.	O	8	32	16	45.7	" "
" 7.	O	9	8	4	5.7	" "
" 8.	P	9	2	1	0.0	" "
" 11.	Q	9	6	3	8.0	" "
" 12.	R	9	16	8	31.4	" "
" 13.	S	9	26	13	38.8	" "
" 14.	T	9	20	10	6.3	" "
" 14.	T	10	4	2	0.6	" "
" 15.	U	10	12	6	2.8	" "
" 19.	W	10	32	16	6.9	" "
" 20.	X	10	10	5	18.3	" "
" 26.	Y	10	16	8	4.0	" "
" 27.	Z	10	20	10	23.0	" "
May 28.	A"	11	12	6	4.0	" "
" 31.	C"	11	62	31	18.3	" "
June 2.	D"	11	58	29	14.4	" "
" 2.	D"	12	44	22	11.4	" "
" 2.	D"	10	34	21	0.5	" "
TOTAL.		13	1670	839	1292.1	" "
Str. RACHE.	57	13	1670	839	1292.1	
Whaleboat.	a	1	19	254	6.5	
GRAND TOTAL.	58	14	1689	1093	1298.6	

* Some plotted on Sheet No. 9^a
 ** Some plotted on Sheet "A".
 *** Some plotted on Sheet No. 2938^a

Soundings are in fathoms

Old Mill Sta 3115

Nov 30 1909

The area within the limits of this survey
is well covered.

The records were kept in a satisfactory
manner and the soundings plotted correctly.

H. S. Simmons

Field sheet 3086

Nov 30 1909

The surroundings of the north shore of Porto Rico
by Capt. H. H. Henshaw and others
H. Henshaw

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