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U. S. COAST AND GEODETIC SURVEY.

*J. W. Horn*, Superintendent.

State: *Florida.*

DESCRIPTIVE REPORT.

*Hydrographic* Sheets Nos. *1825,*  
*1826, 1827, 1828.*

LOCALITY:

*West coast of*  
*Florida.*

*1888.*

CHIEF OF PARTY:

*Lieut. J. W. Moore, U.S.N.*

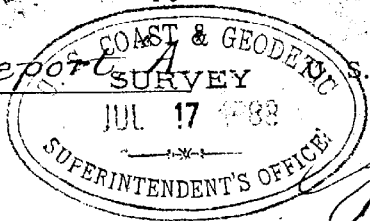
IMPORTANT

PAGES 63 AND 64 WERE ADDED  
THEY ARE NOT PAGES IN THE REPORT  
THEY SHOW DETAIL FROM  
ORIGINAL DOCUMENT MISSING  
FROM THE SCAN OF PAGE 62

Give here full address to which reply should be sent:

New Bedford, Mass.

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U.S. Coast and Geodetic Survey,

Steamer A.D. Bache.

July 9<sup>th</sup> 1888.

Mr. J. M. Thorne

Dir. U.S. C. & G. Survey

Washington, D.C.

Sir:

I beg leave to submit Report "A" as required in "Instructions and Memoranda for Descriptive Reports", of the operations engaged in by the party under my charge on the west coast of Florida during the winter of 1887-'88.

The area covered by the party is included in the limits from Pavilion Key, west coast of Florida, to Cape Sable, thence to Sandy Key, crossing the Bay of Florida to Lemon Key (East Bahia Honda Key), and from that point along the line of Day Keys to N.W. Channel at Key West, and seaward to the ten fathom curve.

I have already in Report B given all

the details of the work performed, and these noted in full any differences that existed. I have there also fully described the preparation of tidal data, and noted all points that I thought would aid the draughtsmen. I beg therefore that my Report "B" be consulted in connection with this Report.

Referring to "Instructions and Memoranda &c," page 6, under the paragraphs arranged, giving suggestions for this report. It is my impression after reading it over, that the suggestions refer mostly to harbor and channel work, and do not, except in a few instances, bear upon the work upon which this party was engaged.

The chart when published will be the best guide. No pilot is necessary in navigating these waters.

There are no harbor improvements in progress or contemplated, on the field of work surveyed.

I am told that a large appropriation is expected on adjoining territory at U. W. Channel. A survey of this channel was made by the

U.S. Engineers during the winter of 1886-'87, and it is said that the jetty system has been recommended.

A vessel can anchor anywhere on the open coast from Cape Sable to Pavilion Key and safely ride out any gale except a hurricane. Such an anchorage, when blowing heavily on shore, is of course uncomfortable, but it is safe. A vessel when anchoring for bad weather should choose a depth bearing three or four feet of water under her keel at low water, and it should be remembered that during a "norther" extremely low tides may occur. This vessel has ridden out at anchor in the open sea, nearly all the heavy gales of the past two winters on the west coast of Florida, and in the majority of instances the steam launch was secured astern. Only in one instance did I feel much anxiety for the safety of the launch, and then we were at anchor in four fathoms of water off Content Key, and it blew a fierce north-easter for three days.

For information concerning tides, currents  
and changes in channels, I beg leave to  
refer to my Report "B".

The statistics for the projections will  
be found appended.

Very respectfully

J. F. Moser.

Lieut. U.S.A., Asst. C. & G. Survey

Chief of Party

Soundings: Florida Bay, West Coast of Florida  
Projection No 1. Reg. No. 1825.

Date 1888	Letter	Number of			Name of Vessel.	Observers
		Boats	Miles Naut.	Sound- ings		
Jan. 24	A	1	80.37	755	39	Ship Lieut. Moser & Ens. Hulme
" 25	B	1	44.45	477	32	" " " "
" 31	C	1	65.63	605	7	" " " " Swift & Bispham
Feb. 3	D	2	86.40	1149	44	" " " " Bispham & Evans
" 4	E	3	127.99	1384	46	" " " " " "
" 6	F	4	39.72	516	24	" " " " Swift & Bispham
" 9	G	5	84.50	1240	16	" " " " & Evans
" 10	H	4	42.90	520	26	" " " " Hulme
" 11	I	2	41.53	543	24	" " " " Swift & Evans
" 15	J	3	49.37	560	3	" " " " " " Hulme, Bispham & Evans
" 17	K	5	72.64	827	13	" " " " " " Bispham & Evans
" 25	L	4	42.00	528	13	" " " " " " Hulme
Mar 1	M	4	48.68	553	6	" " " " " " Swift, Hulme & Bispham
" 7	N	2	44.92	513	20	" " " " " " & Bay, Yeo, Duvon
" 14	O	5	57.04	500	2	" " " " " " & Ens. Swift & Bispham
" 15	P	6	45.53	607	16	" " " " " " " " & Evans
" 21	Q	6	81.08	775	6	" " " " " " Ensigns Swift, Hulme, Bispham & Evans
Apr 10	R	7	53.10	507	2	" " " " " " Lieut. Moser & Ens. Swift, " "
" 11	S	7	20.93	271	12	" " " " " " Ensigns Swift & Evans
" 23	T	6	37.05	287	4	" " " " " " Lieut. Moser & Ens. Hulme & Bispham
" 25	U	8	48.05	812	26	" " " " " " " " " "
" 29	V	8	52.21	833	85	" " " " " " " " & Evans
May 2	W	7	48.23	627	120	" " " " " " " " " "
" 3/4	X	8/9	113.44	938	18	" " " " " " " " Swift, Hulme, Bispham & Evans
" 5	Y	9	41.80	344	12	" " " " " " " " " "
" 8/10	Z	9	64.41	616	142	" " " " " " " " Ensigns Swift, Hulme, Bispham & Evans
Total on Sheet.			1533.97	17287	758	

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Report of Lieut. J. F. Moser, U.S.N.  
Sounding at Florida Bay, U.S. Coast  
Winter, 1888

Soundings: Florida Bay, West Coast of Florida  
 Reg. No. 1826. Proj. No. 2 (Pavilion Key to St. W. Cape)

Date 1888	Letter	Number of —			Name of Vessel.	Observers	
		Book	Miles Naut.	Sound- ings			Angles
Jan. 23	A	1	30.00	467	118	Ship	Lieut Moser & Enns Hulme
" 25	B	1	32.00	471	118	"	" " "
" 27	C	1	20.50	288	72	"	" " " Evans
Feb. 1	D	2	50.68	714	172	"	" " " Hulme
" 2	E	2	68.11	956	196	"	" " " "
" 8	F	3	67.81	940	190	"	" " " "
" 10	G	3	21.00	299	72	"	" " " "
" 11	H	2	16.34	198	38	"	" " " Swift & Hulme
" 16	I	3	31.76	472	78	"	" " " Hulme
" 23	J	4	48.16	737	132	"	" " " "
" 24	K	5	29.75	475	110	"	" " " Swift
			416.11	6017	1296		
Jan. 21	a	1	37.25	1636	200	Stm. launch	Ensigns Swift & Bispham
" 23	b	2	36.00	1292	158	"	" " " "
" 24	c	1, 3	26.00	1033	138	"	" " " "
" 27	d	2	15.20	716	94	"	" " " "
" 28	e	3	8.60	506	46	"	" " " "
Feb. 1	f	4	32.60	1237	144	"	" " " & Evans
" 2	g	3	30.00	1328	164	"	" " " "
" 8	h	4	28.80	1219	144	"	" " " & Bispham
" 10	i	5	27.30	1191	140	"	" " " "
" 16	k	6	28.50	1188	136	"	" " " & Evans
" 23	l	5	36.50	1404	151	"	" " " & Bispham
" 25	m	6	23.20	842	106	"	" " " "
			329.95	13,592	1621		
Jan. 23	a	1	15.60	1391	133	Whale boat	Ensign Evans & Pay Yeo Dunn
" 24	b	2	17.20	1078	138	"	" " " "
" 25	c	1	13.70	832	88	"	" " " "
Feb. 1	d	2	9.00	490	41	"	" Bispham & " "
" 2	e	3	9.30	763	87	"	" " " "
" 8	f	2	13.20	1004	82	"	" Evans & " "
" 10	g	3	13.10	847	82	"	" " " "
" 16	h	4	9.50	590	36	"	" Bispham & " "
" 23	i	3	15.60	888	55	"	" Evans & " "
" 25	k	4	6.80	469	42	"	" " " "
Mar. 5	l	4	9.70	512	57	"	" Bispham & " "
			132.70	8864	841		

Recapitulation				
	416.11	6017	1296	Ship
	329.95	13592	1621	Stm. launch
	132.70	8864	841	Whale boat
Total on S.W.C.	878.76	28,473	2,758	

Report of  
 Lieut. J. F. Moser, U.S.N.  
 Comdg. Steamer "Boache"  
 Winter, 1888.

Soundings: Florida Bay, West coast of Florida  
 Reg. No. 1827. Projection No 3 (N.W. Cape to Content Key)

Date 1888	Letter	Number of			Name of Vessel	Observers
		Boats	Miles Naut.	Sound- ings		
Feb. 25	A	1	37.46	520	118	Ship Lieut. Moser & Ens. Hulme
Mch. 2	B	2	10.31	164	37	" " " "
" 6	C	1	53.36	767	159	" " & Pay. Yeo. Dunn
" 16	D	2	57.10	856	179	" " " "
" 17	E	1	33.09	511	95	Ensigns Swift, Hulme, Bispham & Evans Lieut. Moser & Ens. Hulme
" 19	F	2	39.59	633	45	" " " "
" 20	G	3	64.92	1002	87	Ensigns Swift, Bispham & Evans, & Pay. Yeo. Dunn
" 24	H	3	55.18	866	130	Lieut. Moser & Ens. Hulme
Apr. 12	I	4	21.47	342	71	" " " "
" 13	J	5	49.75	809	130	" " " " & Bispham
" 16	K	4	63.76	1068	158	" " " " & Evans
" 20	L	5	75.90	1214	140	" " " " " "
			561.89	8752	1349	
Feb. 25	a	1	14.75	555	78	Stm. launch Ensigns Swift & Bispham
Mch. 2	b	2	25.00	954	128	" " & Evans
" 3	c	1	4.30	222	30	" " " "
" 5	d	2	39.10	1585	176	" " " "
" 6	e	1	29.40	1020	149	" " & Bispham
" 7	f	3	28.00	1159	125	" " " "
" 17	g	1, 4	22.10	1028	129	" " & Evans
" 19	h	3	12.00	415	52	" " & Bispham
" 24	i	4	17.30	647	90	" " " "
Apr. 3	k	3	20.80	777	112	" " " "
" 4	l	5	27.00	1061	128	" " " "
" 5	m	4	4.20	176	26	" " " "
" 6	n	5	22.60	947	124	" " " "
" 7	o	4	21.60	877	116	" " " "
" 11	p	6	16.00	578	93	" " & Evans
" 12	q	7	27.40	1155	174	" " " "
" 13	r	6	22.00	996	146	" " " "
" 16	s	7	8.70	327	41	" " & Bispham
" 18	t	6	2.00	67	8	" " " "
" 19	u	7, 8	29.10	1081	152	" " " "
" 20	v	6, 9	29.70	971	150	" " " "
			423.05	16598	2227	
Feb. 25	a	1	2.40	195	18	Whale boat Ensign Evans & Pay. Yeo. Dunn
Mch. 17	b	2	8.20	528	76	" " Bispham & " "
" 19	c	1	12.10	1474	149	" " Evans & " "
" 24	d	2	9.80	791	73	" " " "
Apr. 3	e	1, 3	15.10	992	106	" " " "
" 4	f	2	15.40	1128	118	" " " "
" 5	g	3	16.10	598	75	" " " "
" 6	h	4	24.20	1264	104	" " " "
" 7	i	3	14.60	983	105	" " " "
" 12	k	4	18.50	1274	132	" " Bispham & " "
" 18	l	5	4.80	222	32	" " Evans & " "
" 19	m	6	9.20	618	64	" " " "
" 20	n	5	15.40	1098	132	" " " "
May 2	o	6	4.00	130	28	" " Lieut. Moser & Ens. Hulme
			169.80	11295	1212	
383 Sq. Mi. Sound			561.89	8752	1349	Ship Report of Lieut. J. F. Moser, U.S.N.
			423.05	16598	2227	Stm. launch Comdy. Steamer A. D. Bache
			169.80	11295	1212	Whale boat Winter 1888
Total on sheet			1154.74	36645	4768	



Soundings: Florida Bay, West Coast of Florida  
 Reg. No. 1828. Proj. No. 4. (Content Key to N.W. Passage Light)

Date	Letter	Number of—			Name of Vessel	Observers
		Book	Miles Naut.	Soundings		
1888						
Apr 30	A	1	30.70	532	136	Ship Lieut. Moser & Ens. Hulme
May 1	B	1	55.20	950	218	" " " " " "
" 3	C	2	21.50	351	95	" " " " " & Bispham
			107.40	1833	449	
Apr 25	a	1	15.00	612	111	Stm. launch Ensigns Swift & Evans
" 30	b	2	15.00	574	103	" " " & Bispham
May 1	c	1	11.00	413	68	" " " " " "
" 2	d	2	23.50	819	155	" " " " " "
			64.50	2418	437	
Apr 25	a	1	9.90	796	90	Whale boat Ensign Bispham & Pay. Yeo, Dunn
" 30	b	2	16.30	1370	103	" " Evans & Sea. Veith
May 1	c	1	10.90	926	32	" " " " " "
" 2	d	2	9.60	790	72	" " " " " "
" 10	e	1	4.50	273	33	" " Bispham & " "
			51.20	4155	330	

Recapitulation				
	107.40	1833	449	Ship
	64.50	2418	437	Stm. launch
	51.20	4155	330	Whale boat
Total on Sheet.	223.10	8406	1216	

Report of Lieut. J. F. Moser, U.S.N.  
 Family Stationer at St. Roch  
 Winter 1888

Assist in the

Final matter of  
interest about  
middle of report.  
Return to files when  
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all the information  
as very interesting  
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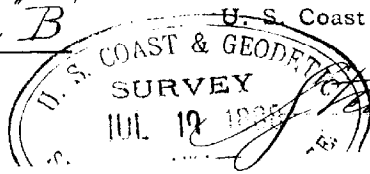
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Give here the address to which reply should be sent:

New Bedford, Mass.

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ack'd  
Report "B"



U. S. Coast and Geodetic Survey,

SURVEY

JUL 19 1888

Steamer A.D. Bache

July 9<sup>th</sup> 1888

Mr. F. M. Thorn

Superintendent U. S. C. & G. Survey  
Washington, D. C.

Sir:

In obedience to paragraph 26, page 31, Laws and Regulations, Coast and Geodetic Survey, 1884, I beg leave to submit the following report of the operations of the Hydrographic party under my charge during the winter season of 1884-'88 on the west coast of Florida.

Having refitted at Baltimore, this party, agreeably to your instructions, sailed for Key West, Fla., January 3<sup>rd</sup> and, after a pleasant passage, arrived at that port January 10<sup>th</sup>. The party was detained there several days in making the usual preparations: coaling and taking on board signal lumber and stores; and suffered a further delay by a heavy

"Norther". However on January 16<sup>th</sup> we left Key West for the vicinity of our work, and the same afternoon commenced field operations. The work allotted to the party was the continuation of the original coast hydrography, from the last line on which this party closed work the previous winter season. This line extended W. S. W. magnetic, from Pavilion Key, said Key being one of the prominent coast islands, about 21 miles S. E. from Cape Romano.

The work was prosecuted vigorously from the opening until the close, May 10<sup>th</sup>, when it was completed, thus finishing the outside original hydrography from Eastport, Me., to the delta. We were much disappointed in the weather which we experienced during the season. I imagined that throughout the whole winter, on the coast of Florida, we would encounter nothing but calms and light airs with an occasional "Norther", gales and continuous heavy winds never for a moment entered my calculations. I fancied

that week after week we could work on summer seas without any interruption. Imagine then my surprise when we found "northerers" quite frequent, and the intervals filled in by such strong Easterly winds amounting in many instances to heavy gales. For the first four weeks the weather was favorable for our work and progress was rapid, but after that time and until the close of the work, favorable days were the exception, and although work was vigorously continued whenever the slightest opportunity offered, as will be seen by the reports and by the enormous amount of work done, yet it required a supreme effort and was attended at times with some little risk. There was but little rest, change, or recreation for anyone. We went to Key West for our mail once in two weeks, and when prevented from work, we lay on an open coast rolling and pitching to the seas. On account of the shallow water we were obliged to anchor from four to six miles from shore, until within a few weeks of the close

of our work, when after passing Content Key the water became bolder and we could approach near enough to the land to at least recognize objects.

The party suffered very little delay in the early part of the work in erecting and locating signals as the triangulation as far as Cape Sable had only been finished the previous year, and the signals erected were nearly all in position. But in making the connection between Cape Sable and East Bahia Honda Key - the easternmost Key of the group making to the eastward of Key West - much trouble was anticipated on account of the triangulation of those keys having been finished in 1856-'58, and the records being so meagre that descriptions of but three or four  $\Delta$ 's could be obtained. As the distance from Cape Sable to East Bahia Honda Key is about 72 miles, it was necessary either, to carry the triangulation across the water by an elaborate and expensive system of water signals, or abandon the Cape Sable system and establish

the lines on the Bay Key side from the  $\Delta$ s that could be found remaining from the original triangulation of the Bay Keys and reefs. I chose the latter knowing that if we failed to find any of the Bay Key  $\Delta$ s we could fall back on the line of outside reefs and be certain to locate from the Reef Light and Reef Day Beacons. For this purpose we went to Bahia Honda as it afforded a central point from which to carry on our search for  $\Delta$ s, and a good harbor anchorage. After entering the harbor of Bahia Honda and seeing the formation of the Keys, their rocky nature increased my hopes of an early settlement of the difficulty, for I saw at once that the changes could not have been great, and if any attention at all was paid to the marking of the original  $\Delta$ s we could surely find some few remaining. It is hardly necessary in this connection to give the details of our search. Suffice it to say that we were not entirely disappointed. After diligent search we recovered a few of the  $\Delta$ s, and in less than ten days

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the signals were up and the new system of soundings commenced. I carefully re-marked the sus found, and will append a description of these for the archives and the information of the Computing division.

The system of development was similar to that executed in previous years. The work was closely connected with the shore line and around the islands as far as the signals would permit.

Between Pavilion Key and Cape Bable there are several shallow tortuous channels, from four to six feet in depth, that lead between the Keys towards the main land; these may need some attention after the topography is finished. The most important of these are the entrances to Lostmans River, Rodgers River and Shark River. I am told that there are a few settlers on the banks of these rivers. Rodgers River extends back about ten miles, and then terminates in a large lagoon of fresh water, and I am told the main land is about eight miles back from



the lagoon. I use the word back as I could get no compass directions. Shark River, I am told, has its source in the same lagoon. One family live at Palm Pt, and are engaged in cultivating coconut trees which are planted from N.W. Cape (North Cape) to Cape Table (East Cape). A few words in regard to the names in this locality may not be amiss. The term, Cape Table, is applied to the whole of the head from the point we call N.W. Cape to Cape Table on Chart 15. N.W. Cape, as given on that chart, is known by that name, but more frequently it is referred to as North Cape. Palm Pt. is more generally known as Middle Cape, and the point we call Cape Table on Chart 15 is known as East Cape.

Between Pavilion Key and East Cape the bottom is very regular, the depths increasing gradually and with great regularity to the ten fathom curve. Off East Cape the bottom becomes irregular, which increases in a line towards East Bahia Honda Key (Lemon Key).

Chart 15). From thence to Content Key and seaward to the three fathom curve, it is very much broken; shoals out or nearly out of water, at low water, are numerous, and extensive banks dry at low water may be found five and six miles from shore. Narrow tortuous channels intervene, ending in cul-de-sacs or spread out over great areas of very shallow water. There are also many holes with three and more fathoms of water. The survey of these waters was difficult and laborious as no land could be seen from the outer shoals.

We succeeded however in locating signals on the shoals and from these and a few water signals were able to locate our lines. I feel confident that the contours will be found well traced and the channels properly traversed.

From Content Key to N.W. Passage the bottom again assumes a regular form: the three fathom curve approaching the shore line within a mile. Several shallow channels pass through the line of reefs, connecting the Bay Keys, which will be referred to later in this report.

I saw one outcrop of rock from Pavilion Key to East Cape, and my views are expressed in my last report from this section, on the formation, I believe to be correct. From my additional experience this year, I believe that underlying these fringing islands and forming their base, at no great distance from the surface the coral rock will be found. The Keys extending to the Eastward of Key West, as far as my observations extend, are rocky, and between them are rocky shelves and barriers. Several Keys that I visited, notably Big and Little Pine Keys, Snake Key, Torch Key and Plover Key, are composed of a coral rock lying in a horizontal strata<sup>um</sup>, even and floor-like, here and there broken, and in the crevices the trees and shrubs take root. Along the shore line the rock is broken, but the under strata<sup>um</sup> shelves into the water forming the bottom, which is rock wherever I was able to examine it. It is quite possible that in past ages when the rock was formed from the coral which had been previously ground

into sand by the ceaseless motions of the surrounding waters, that in the upheaval which followed, these keys were all connected, and formed one strata<sup>um</sup> of rock above the waters; but subsequently the action of the sea cut away the softer portion and left the harder strata to resist the action of the sea and form the foundations for the present keys. I examined the different strata~~s~~ of rock in Key West, where it has been exposed in building &c, and found some strata~~s~~ that were soft enough to crumble in the hand. I mention this, not only as a witness of the possibility of what I have here stated, but also to account for the spot holes and cul-de-sacs in the channels bordering these islands, and previously noticed; The tidal current, where an opening had once been effected, is also a mighty factor and will account for the shallow channels through the Keys in a north and south direction.

I was particularly struck with the similarity of the rock exposures on the water line

of these keys, and the same exposures in the vicinity of Ahassahowitzka, south of Cedar Keys.

I have no doubt that the bottom over the whole extent of the past season's work is rock, for the most part covered with sand. I tried this year again to pump and drive water signals, but failed as I did last year, and I could in every case feel with my hand where the sharpened scantling struck the hard rock; it was unmistakable. I further believe that this rocky formation extends to the 100 fathom curve, from which point the depths increase quickly into the basin of the Gulf.

The specimens of the bottom, from the three fathom curve to the ten fathom curve, were quite similar in quality differing chiefly in the degree of coarseness. Near shore they consist of coarsely broken shells and sand, which becomes finer as the depths are increased, gradually becoming mixed with more sand, and on the ten fathom curve the specimens are generally fine grey sand mixed with a

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few finely broken shells.

I have mentioned my belief that the foundation of the Keys is coral rock. While this is apparent to anyone, on the Keys extending from Key West to East Bahia Honda (Lemon Key), I saw no coral rock outcrop from Cape Sable to Pavilion Key on the fringing Keys that came under my observations, but, as before mentioned, I believe that under these Keys and at no great depth the strata of coral rock will be found dipping under the waters, and that the rock will be found cropping out in the Keys nearer the main land or on the main land itself. The forces in operation at the present time, and probably during past ages, on the sections from East Cape to the northward are different from those in effect east of Key West. On the former sections the detritus from the Everglades, aided by the conditions existing and in active operation at the present day, has formed in advance the thousands of fringing islands; probably in the manner explained in my last report from this section.

On the latter section, from Key West East, no such conditions exist; in fact the erosions caused by tidal currents and sea are greater in tearing down the fabric than the fauna and flora are able to build up.

I do not wish to convey the impression in this report that all the keys of the group east of Key West, consist of rock exposed at high water. Whilst all the keys in the group which I visited have a rocky floor, there are many small mangrove keys built up on a rocky bottom which is never exposed above the water.

I was much interested in noting the manner in which these mangroves are formed. One can here see the progressions from single stalks to two and three, and thence on to bunches, clusters, clumps and islands. The tidal current is continually carrying the seed stalks hither and thither. You see large progressions of these, long brownish looking objects floating along with one end more submerged than the other. Under favorable conditions,

such as an extremely low tide, the stranding of a tree or log, the lower end of the seed stalk becomes lodged and the rootlets soon take hold. Ever long there rises above the water a stem, leaves appear, and the foundation is laid for a colony which in a few years becomes a mangrove island.

My time did not permit any very extensive dredging but sufficient was done to prove that the fauna was the same on the littoral as that obtained in the vicinity of Cedar Keys. I mentioned last year in my report that south of Cape Romano we obtained no living coral in the dredge. I am glad to say that this year I obtained a few small specimens, one of which I kept alive for two months. I also obtained a number of living specimens between the keys during my short anchorage at Bahia Honda. They were all Madrepores.

— South of Cape Romano I frequently encountered, on a calm day and in the morning, many very large crabs springing from the



water, some of them must have measured 12 or 14 feet across the body. Sharks are numerous, particularly the young, although we saw many very large ones.

We were not very successful in fishing off the vessel in 12 to 14 feet of water. Catfish and remora were all we obtained at these shallow water anchorages, except off Rodgers River, where in 17 feet of water we killed a number of groupers and grunts. Along the keys we frequently hauled the seine and took sheep's head, sea trout, spanish mackerel, moon fish, red fish, toad fish, porcupine fish and balloon fish. In season many teal ducks are found between the keys. There are also very many deer and very many opossums. Hunting should however be carried on with dogs, and under the most favorable conditions is laborious, as the underbrush is heavy and is said to abound in snakes.

Pardon the digression which may not be pertinent to the work in hand, but it is

very interesting to me and maybe of some value in this connection.

In our field of work there are no regular fishing banks; fish are obtained everywhere in the deeper waters, five to ten and more fathoms.

In the vicinity of East Keys, and thence to East Bahia Honda Key, and to Content Key and seaward to three fathoms, on the broken ground before mentioned, the turtles set their nets, and they take the loggerhead and green turtle. I am told also that the hawk-bill is here found, but I saw none and fancy they are not plentiful. The turtles have small schooners of about four feet draught, and consider the broken bottom off the Keys, from East Bahia Honda to Content, a favorable place. The nets are made of heavy material with large meshes, and when the turtle gets a flipper through the mesh his motion with it is such as to fold the net towards him. Boats watch the nets and the floats indicate where the turtle is foul. Pans, called crawls,

for the confinement of turtles are built in the shallow water near the keys, and when a sufficient number are taken they are carried to Key West, and from thence shipped to market. Turtles are also taken by means of iron pegs about two inches long, squared to a point with a square projecting shoulder; this peg is loosely fitted, by means of a socket, to a pole. The turtle sleeping on the water is noiselessly approached in a boat, and a light tap drives the iron peg through his shell; a stout line to the peg captures the turtle. This method is not preferred as it destroys the shell which has some value. During the breeding season many are captured on the beaches where they lay their eggs. A favorable place is the long fine beach from East Cape to North Cape Capeable.

This same locality - vicinity of East Bahia Honda Key - is also resorted to by spongers. I am told that it is an excellent sponging ground, but that the waters are generally

not clear enough. Any wind that causes a sea discolors the waters and is therefore not favorable for their operations.

A few sharpies, and other small vessels are employed in communicating with the scattered settlers at the different points and carrying their produce to market. There are no steamers. On several of the keys east of Key West I saw single habitations where they were trying to grow tomatoes, egg plant &c for northern markets. In all my experience in Key West, which is the largest city in Florida, I have never seen a banana fit to eat nor an orange that would rank with that fruit usually found in a northern country store; yet you pay there more for these fruits than you do in New York city for a high grade article.

Near the hydrographic signal "Tent" on Lostman's Key, we found a  $\Delta$  marked and with a small tripod over it. Another was found between  $\Delta$  Stump and  $\Delta$  Harney. These two  $\Delta$ s were not given on our sheets,

and I understand they have no value. I mention it here as they may be misleading in future years.

\* Referring again to the work from East Bahía Honda Key to Key West, I desire to say a few words in regard to the channels from the reefs through the keys into the Bay. Our work was finished on a line from Sandy Key to East Bahía Honda Key, and thence from key to key bordering the Gulf as far as N.W. Channel, connecting there with the work finished in previous years. The inshore portion of our work, where the lines did not terminate on the keys, ended on shallow banks. It will be seen after the work is plotted that there are several narrow shallow channels entering between the keys, the mouths of which will be found traversed as far as the line of keys. If it is desirable that these channels should ever be surveyed it can only be done advantageously from an inside position, and in a vessel suitably adapted for that purpose. Whatever channels exist run across the line

X

of Keys in a north and south direction; they do not communicate in an east and west direction. For instance I am told that one foot of water, at low water, can not be carried from Bahia Honda Harbor to Key West, inside; but that three to four feet can be carried in several places from the reefs to the Gulf, west of Bahia Honda. There are two main channels which are used by small vessels and run from the reefs to the Gulf, which should be thoroughly surveyed. One, called the Spanish Key Channel which runs from Bahia Honda Harbor, west of Big Spanish Key, and east of Harbor Island into the Bay, the entrance of which, as far as Big Spanish Key, was traversed by us; and Knight Key Channel which runs west of Knight Key, and thence between banks entering the Bay east of East Bahia Honda Key. From the reefs to Mayos Key the Spanish Key Channel is broad, deep and wide, but from thence to the Gulf it varies in depth and becomes narrow and tortuous. About six feet can be carried

through this channel. Our work did not touch upon the Knight Key Channel so that I can only state that I am told that seven feet can be carried through it.

Concerning Barnes' Sound our work was carried to a line from Sandy Key to East Bahia Honda Key. On the last line the best water we obtained was about 13 feet, and this was confined to a narrow space. From my own experience and what I could learn from others, I should say that the waters beyond this line and included between the straggling line of keys bordering the Florida Reefs and the main land, are shoal with extensive banks nearly or quite out of water at low water - narrow winding channels intervene, deep in some places and shallow in others. In fact it is a region of broken waters which will involve some labor in surveying owing to its extent and its broken nature. In my opinion all these waters should be completed, not that they are of any particular value to commerce.

but that they belong to a system which is not finished until these waters are included. The survey might be of value in defence. The greatest difficulty would probably be in building and locating the signals. The shoals could be contoured and the channels traversed, which would be quite sufficient. In my opinion the waters between the keys east of Key West should also be surveyed, not very elaborately but sufficiently to fill up the blank space on our chart. There are no channels there except those before noted of any particular value, but we carry these keys on our charts and if there is no great depth there it should be indicated. As before mentioned, an elaborate survey is not necessary, for it would be expensive owing to the great number of signals that would be required; for it must be remembered that these keys are heavily wooded. The lines of soundings could in great part be located from the topographical features and the work would be quite accurate enough for the purpose.



In regard to the work executed during the season I desire to say that on many days when it was too rough for the boats to work lines were run by the vessel, and X where these lines cross series of others there may be a difference of a foot (probably much less).

I have already referred to the shore formations and will now attempt a few words which may be of service from a nautical point. From Pavilion Key to East Cape the shore has the same appearance as noted in my previous report: the keys have a thick growth and are so blended that it appears like a continuous shore line; the entrances are only apparent on very close approach. There are no marked prominent features so that a stranger could distinguish one portion of the coast from another. Pavilion Key is more prominent on approaching from a westerly point and has a sand beach on the western side. On Lostman's Key there is a beach along the whole of the Gulf face.

A beautiful beach extends from North Cape to East Cape. There are several small buildings at Middle Cape with the <sup>roofs</sup> grooves painted red and a prominent palm tree back of the houses. At East Cape there are two small buildings with the <sup>roofs</sup> grooves painted red. Between Middle Cape and East Cape is a dwelling and back of it a grove of palms which is conspicuous and a good land mark. The Bay Keys from N.W. Channel to the Eastward excepting for their size are quite similar in appearance, but as these keys as far as Content can be approached with deep water very closely, and as they are not so thickly clustered their shapes are more readily made out. I would also say that as these keys are much nearer Key West the timber has been thinned out for use at that place, and the growth does not appear so dense. Sawyer Key has a sand beach along the Gulf face.

The best guide in approaching the Coast is the lead, and is a safe guide except on

the broken ground mentioned before. Vessels in running for points between East Cape and Romano, from N.W. Channel, usually run for Middle Cape; the soundings are perfectly regular on this line. In running up the coast the depth suitable for the vessel can be selected. In running for Middle Cape the palm trees before referred to are the first objects that can be distinguished. Vessels bound up Barnes Sound will do well to sight Cape Sable before turning, unless very certain of their position. In carrying a vessel like the "Pache", say ten feet draught, as far as our survey extended I should steer for East Cape from N.W. Channel, and after bringing that point well in sight I should haul through the sound keeping Sandy Key in plain sight after making it. I should avoid plainly sighting the keys from Harbor Key to East Bahia Honda Key.

The shallow waters of the coast afford a safe anchorage in any weather except a hurricane. The prevailing winds during

26  
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our work were easterly. The heaviest gales  
"Norther" and Southeasters

### Tides

The tides in the Gulf of Mexico, are, as a general thing, not much thought of, owing to the prevailing impression that there is but one tide that can be so called, and the rise and fall of that one so small as to be of little consequence. This is my second season on the west coast of Florida and from my observations I can say that the tide forms a very important factor which must be considered. I know of no place on our coast where a permanent tide station would prove as remunerative in furnishing information as one on a well selected point on the west coast of Florida.

A continuous series of day and night tides were observed at some point of our cove from the day of opening until the close of the season. The curves were all plotted and have been forwarded with the

records. I found the tides very complicated, particularly for the reductions of a work covering an area on which the extremes differed as much as four hours in time and several feet in rise and fall. In order to make the reductions as accurate as possible numerous comparison stations were made, and after the tidal data was computed the stations with the data were plotted.

The area covered by the lines of soundings was then laid out in blocks, each block having special reference to a central station. In some instances it was necessary to construct reductions from observed data in order to meet the graduations. The blocks were graded one into the other so that at no points were the differences greater than one-half hour in time or four-tenths of a foot in rise and fall. The area covered by each block is entirely dependent upon the differences which were found to exist in the tides. I will append notes in full, descriptive of each block, together with the methods

Employed, so that it may readily be seen how the reductions were made; each tide book also contains a full explanation.

On the sounding sheets will also be found the limits of the blocks lightly drawn in red ink. Of course all this involved a large amount of work and extreme care, as the reductions had to be carefully supervised to avoid error. I am glad to say that all my efforts in this direction were heartily seconded by the officers who cheerfully carried out my instructions.

The tides on our work set in an east and west direction; that is from Pavilion Key to N. W. Cape they set on and off shore, and from N. W. Channel to Harbor Key they set along shore. At the entrance to Barnes' Sound they trend through the sound. Off Middle Cape, the flood current trends to the southward through Barnes' Sound. The great part of the tide comes from the Gulf, but on the approaches to the southern part of our work some tidal influence is felt from the creeks,

and, in southerly winds this becomes an important factor. In fact the winds exert a great influence over the tides in this locality, a "barther" making extreme low water.

We occupied two off-shore tidal comparison stations, in five and seven fathoms of water, to see whether the great rise and fall near shore was not due to the accumulations of the wave, as it rolled over so gradual a shelving bottom, but we found little or no difference. We used a Patchelder Pressure Gauge which worked perfectly. At those stations we also obtained a series of current observations which were forwarded with the records.

The following is Ensign H. A. Bispham's report to me on the tides. Under my direction this gentleman had charge of all tidal matters and I desire here to express my appreciation of his services. In this report will be found in detail the system of blocks with everything pertaining to the tidal data.

"During the season's work Tide stations were occupied as follows:-

- (1) On Loston's Key, near Hydrographic signal "Tent" - from January 20<sup>th</sup>, 1888, to March 5<sup>th</sup>, 1888
- (2) On Cape Sable, near Cape Sable Astronomical Station:- from March 3<sup>rd</sup>, 1888, to April 15<sup>th</sup>, 1888
- (3) On Content Key, near Hydrographic signal Content Key - from April 11<sup>th</sup>, 1888, to May 9<sup>th</sup>, 1888

Comparison Tide-gauges were established:-

- (1) Near Alpha, - Pos.  $\Delta$  Hamilton to  $\Delta$  Pavilion Key 40.44  
 $\Delta$  Pavilion Key to Fordland 32.37
- (2) At Hydrographic signal Pache F.M. "A 2"  
 Position:  $\circ$  Rose to  $\circ$  Squall 31.35  
 $\circ$  Squall to  $\circ$  Shoal 19.22
- (3) At a position: Lat. 25.19 N. Long. 81.43 W
- (4) At a position: Lat. 25.08 N. Long. 81.28 W
- (5) At N.W. Whannel Light House

At the Tent tide-gauge a plain staff gauge was used. 87 High waters and 87 Low waters were observed continuously; of these, 1 Low water was rejected on account of an error in reading the gauge. A mean of the low waters gave the reading of



the gauge 4.1 ft. A bench mark was established, which is separately described with the gauge.

At the Cape Sable Gauge a plain staff was used; 81 High waters and 81 Low waters were observed continuously, with the exception of 2 high waters and 2 low waters, when the gauge was carried away in a heavy gale. A bench mark established when the first gauge was planted, enabled the readings of the first to be referred to the second gauge. 1 high water and 1 low water were rejected, the mean of 80 low waters gave a reading of 4.8 ft. The description of bench mark and other data will be given separately.

At the Content Key Gauge a plain staff was used; 3 high waters and 1 low water were missed on account of heavy surf. 59 high waters and 54 low waters were observed; the mean of 54 low waters gave the reading to be 2.2 ft.

The gauges at Tent and Cape Sable were running together from March 3<sup>rd</sup> to March 5<sup>th</sup> inclusive, giving 4 high waters and 3 low waters for a comparison.

The gauges at Cape Sable and Content Key were running together from April 11<sup>th</sup> to April 15<sup>th</sup> inclusive, giving 7 high waters and 8 low waters for a comparison.

The comparison gauge at "Alpha" was established February 21<sup>st</sup>, and compared with the Tent gauge; a comparison of 2 high waters and 3 low waters were obtained. The gauge was a plain staff, rigged to a light temporary water signal.

The comparison gauge at "Pache's" was established April 18<sup>th</sup>, and compared with the Content Key gauge; a comparison of 3 high waters and 4 low waters was obtained. A gauge similar to the one at "Alpha" was used.

The comparison gauge in Lat. 25° 19' N. Long. 81° 43' W. was established May 4<sup>th</sup>, and compared with the Content Key gauge; a comparison of 2 high waters and 2 low waters was obtained. A Hatchelder Pressure Gauge was used.

The comparison gauge in Lat. 25° 08' N. Long. 81° 38' W. was established May 8<sup>th</sup>, and compared with the Content Key gauge; a comparison of 2 high waters and 2 low waters was obtained. The

Pressure Gauge was used here also

The comparison gauge at St. W. Channel Pt. No. was established May 3<sup>rd</sup>, and compared with the Content Key gauge; a comparison of 13 high waters and 12 low waters was obtained. A plain staff gauge was used.

On account of the differences between the principal tide gauges, the intervening space was divided into blocks. A tide book was made for each block; the method of obtaining the tidal reductions, together with the boundaries of the blocks will be given hereafter.

The comparisons between Tent and Cape Sable gauges and between Cape Sable and Content Key gauges give the following results:

The Mean Rise and Fall at Tent is .77 ft greater than at Cape Sable

The Difference in Time at Tent is 1 hour earlier than at Cape Sable

The Mean Rise and Fall at Cape Sable is .8 ft less than at Content Key.

The Difference in Time at Cape Table is 2 hours later than at Content Key

Therefore the mean Rise and Fall at Tent is the same as at Content Key. The Difference in Time at Tent is 1 hour later than at Content Key

Results of Comparison Gauges

At "Alpha":

The Mean Rise and Fall is the same as at Tent  
The Difference in Time is unappreciable

At Pache's 2"

The Mean Difference in Rise and Fall is .4 ft less  
than at Content Key  
The Mean Difference in Time is 1 hour 30 minutes  
later than at Content Key.

At 1<sup>st</sup> Anchorage: (Lat. 25° 19' N. Long 81° 43' W.)

The Mean Difference in Rise and Fall is .2 ft less  
than at Content Key  
The Mean Difference in Time is unappreciable

At 2<sup>nd</sup> Anchorage: (Lat. 25° 08' N. Long 81° 28' W.)

The Mean Difference in Rise and Fall is .2 ft less  
than at Content Key  
The Mean Difference in Time is 0 hours, 40 minutes  
later than at Content Key

At N. W. Channel L. K.

The Mean Difference in Rise and Fall is .8 ft.  
less than at Content Key

The Mean Difference in Time is 40 minutes  
earlier than at Content Key

Description and Limits of Blocks

The Tenth Tide gauge is applied to all work from the northern limit of the work to a line running N. S. W. (mag.) from Hyd. Sig. "Stump" as far as the work to develop the 3 fathom curve.

Block 1. extends from this line to a line running N. S. W. (mag.) from Hyd. Sig. "Shell", as far as the work to develop the 3 fathom curve.

Block 2. (Cape Sable Gauge) extends from "Shell" to a line N. E. from o Pache 7. M. "2" running N. W. and S. E. (true)

Block 3. extends from this line near o Pache 7. M. "2" to a line running N. W. (mag.) from o "Sharp"

Block 4. extends from o "Sharp" to a line running North (mag.) from o "Crawl"

Block 5. extends from o "Crawl" to a line running North (mag.) from o "Big Spanish"

Block 6. (Content Key gauge) extends from "Big Spanish" to a line running N. W. (mag.) from o "Crest"

Block 7. extends from "Crest" to a line running N. W. (mag.) from a point midway between o "Water" and o "Bank", as far as the boat work

Extends and "W" <sup>13</sup> to <sup>27</sup>

Block 8. extends from this line to the western limit of rock, including only boat work

Block 1. is obtained from Tent Gauge & Table Gauge:

by adding (+) 30 min. to time at Tent

by subtracting (-) .4 ft from height at Tent

Or by subtracting (-) 30 mins. from time at Table.

by adding (+) .4 ft to height at Table.

(see p. 33. for difference in time and height between Tent & Table.)

Block 2. is obtained directly from the gauge at Cape Table, or can be deduced by the relations which were found to exist between Table and Tent, and Table and Content (see p. 33)

Block 3. is obtained from the gauge at Table:

by subtracting (-) 30 mins. from time at Table.

by adding (+) .4 ft. to height at Table.

From Content Gauge: by adding (+) 1 hr. 30 min. to time at Content

by subtracting (-) .4 ft. from height at Content

Block 4. is obtained from the gauge at Table:

by subtracting (-) 1 hour from time at Table

by adding (+) .5 ft. to height at Table



Block H. (Continued)

From Content Gauge: by adding (+) 1 hr. to time at Content  
by subtracting (-) 3 ft. from height at Content

Block 5. is obtained <sup>from</sup> the gauge at Table:

by subtracting (-) 1 hr. 30 min. from time at Table

by adding (+) 6 ft. to height at Table

<sup>17</sup>From Content Gauge: by adding (+) 30 min. to time at Content

by subtracting (-) 2 ft. from height at Content

Block 6. is obtained directly from the Content Key Gauge, or can be deduced from the relation which was found to exist between Table Gauge and Content, and between Tent Gauge & Content Gauge (see p. 33).

Block 7. is obtained from Content Key Gauge:

by subtracting (-) 20 min. from time at Content

by subtracting (-) 4 ft. from height at Content

Block 8. is obtained from Content Key Gauge:

by subtracting (-) 40 min. from time at Content

by subtracting (-) 8 ft. from height at Content

## Tide Gauges & Blocks for each Projection

Projection No. 1.: This projection embraces all the ship work for development beyond the 3 fm. curve; lines running in to less than 3 fms. to ship position. All the gauges and blocks affecting the soundings are shown on the sheet. Block 8, does not enter into the reduction of any line; Block 7, only that portion of "W" day between <sup>13</sup> and <sup>21</sup>. All the remaining work beyond the limit of the boat and Blocks 2, 3, 4 & 5, is reduced from the data at Content Key Gauges.

Projection No. 2.: The work on this sheet as far as a line running N. S. W. from "Stump" is corrected by data from the Tent Gauge; the remainder of the sheet by Block 1. The limits are marked on the projection.

Projection No. 3.: The work as far as "Shell" is corrected by Block 1. The remainder of the work is corrected by Blocks 2, 3, 4, 5 & 6, as described on page 37 and shown on the projection.

Projection No. 4.: The work is corrected by Blocks 6, 7 & 8, as described on page 37, and shown on the projection.

Tide Station near  $\odot$  Tent, West coast of Florida  
Observations from January 20<sup>th</sup>, 1888, to March 5<sup>th</sup>,  
1888,

The gauge used was a plain staff gauge, numbers increasing with rise of tide. It was located near  $\odot$  Tent, and near a marble slab marking a triangulation point not shown on sheet. Distant from  $\odot$  Tent 150 m., from slab 165 m.

The bench mark is the top of the marble slab.

Mean of 84 High waters,	7.48 ft.
" " 86 Low "	4.06 "
Mean Rise and Fall	3.42 "
Bench mark on Staff	14.54 "
" " above M.L.W.	10.48 "

Tide Station on Cape Bable, near Cape Sable  
Astronomical Station, West Coast of Florida.

Observations from March 30<sup>th</sup>, 1888, to April 15<sup>th</sup>, 1888

The gauge used was a plain staff gauge, num-  
bers increasing with rise of tide. It was located near  
Cape Bable Astronomical Station, distant from  
the brick monument 700 meters.

The bench marks are the top of the monument,  
and an iron nail driven in the center of the  
south face of same.

The first gauge carried away March 11<sup>th</sup>.

The first determination of bench marks as follows:

- (Tail) Bench Mark on Staff (First) 10.35 ft.
- (Top) " " " " " 12.04 "
- (Tail) " " " " (Second) 14.02 "
- (Top) " " " " " 15.72 "

The first gauge is connected to the second by a  
correction of + 3.7 ft.

Mean of 80 High waters 7.77 ft.

" " 80 Low " 4.82 "

Mean Rise & Fall 2.95 "

(Tail) Bench Mark on Staff 14.02	}	(Tail) P.M. above M.L.W. 9.2
(Top) " " " " 15.72		(Top) " " " 10.9

Tide Station on Content Key, near "Content No. 2"  
 Observations from April 11<sup>th</sup>, 1888, to May 9<sup>th</sup>, 1888.

The gauge used was a plain staff gauge, numbers increasing with rise of tide. It was located near "Content" (not recovered) distant 200 meters.

The Bench Mark is a copper nail driven in a mangrove tree. A deep cut in shape of a triangle ( $\Delta$ ) with a copper nail at each vertex surrounds the B.M. Over this is a wide blaze. The tree is situated as far to the westward of the gauge as "Content 2" is to the Eastward. It is on the southern edge of a high rocky ridge, near a lagoon, and towards the western edge of the island.

Mean of 52 High waters 5.64 ft.

" " 54 Low " 2.16 "

Mean Rise and Fall 3.51 "

Bench Mark on Gauge 9.57 "

" " above M.L.W. 7.4 "

Tide observers

At Tent Gauge: Jakob Jakobsen & J. E. Boyd, Sea.

At Cape Table ": From March 3<sup>rd</sup> to March 6<sup>th</sup>,

Martin Christoffersen & Karl Knudsen, Sea.

From March 6<sup>th</sup> to April 15<sup>th</sup>

Jakob Jakobsen & J. E. Boyd, Sea.

At Content Key: From April 11<sup>th</sup> to April 25<sup>th</sup>

Martin Christoffersen & Karl Knudsen, Sea.

From April 25<sup>th</sup> to May 9<sup>th</sup>

Jakob Jakobsen & J. E. Boyd, Sea.

At N.W. Channel St. Ho.: Martin Christoffersen, Sea.

At the anchorages of the ship, the Quarter-  
masters on watch observed the tides.

A continuous curve has been plotted  
for each tide station "

Ensign W. A. Hulme had charge of all the draughting, and carried on the work very satisfactorily.

I beg to particularly mention the services rendered by the Executive Officer, Ensign J. Swift, who had charge of all the steam launch work, and the cheerful and thorough manner in which he carried out all my instructions always met my strongest approbation.

My thanks are also due Ensign G. R. Evans, P. A. Surgeon J. M. Steele, Asst Engineer A. H. Leonard, Pay. Geo. J. L. Dunn, and the other officers and men, for the thorough manner in which the work was executed.

I desire only to add the grand total of our season's work, which speaks for more than words.

Ch. of miles of soundings (Chart)	3790.54
" " " " " " (Statute Log)	4365.72
" " Soundings	9,081.1
" " Angles	10,520

The detailed statistics will be found  
appended.

Very respectfully  
J. F. Moser.

Lieut. U.S. Art. Unit. C. & G. I.

Chief of Party



Descriptions of original  $\Delta^m$  recovered.

$\Delta$  Glover: Found this  $\Delta^m$  on a level rocky plain containing a scattered scrub growth, and showing evidence of being flooded at very high water. The rock is a honey-combed coral rock having a slightly ringing sound like blinkstone, and lava-like in appearance. A mound of rocks was discovered, and on its side, outside the mound, a granite post square at the end with a cross on top. As this granite post fitted a space in the center of the mound of rocks, it was restored to its position and three hard black wood stakes driven equidistant from each other and from the center. A long stick of yellow pine was driven alongside of the granite post. One of the stakes is about four feet above the surface and can be seen above the scrub growth. A single stick signal was erected. There are no prominent objects in sight. Two small shallow ponds are in sight from the signal.

Δ Torch: Found this Δ<sup>m</sup> in the locality shown on the projection. It is on a low rocky shore and a short distance back from the high water mark. Three buttonwood stakes were found in position: one with a copper tack, one with a copper nail, and third evidently had a copper nail or tack but it had dropped out. The stakes though very old were in a very fair condition. A single stick signal was erected, new hard black wood stakes were driven alongside of the old ones, and a large pile of rocks heaped around them.

A Necesshoe

Point visited and recovered. It is situated as shown on the projection. The island is low, with a sandy ridge in the direction of its length, above the highest high water. A growth of mangrove trees fringes the island, the ridge being covered with coarse grass. The point is on this ridge, a little S.W. of the center of the island, and marked by a granite pillar, squared, and with a cross on top, showing above ground two inches. Around the point are four pine pegs, about two and a half feet high; the pegs at legs of tripod at this point also recovered.

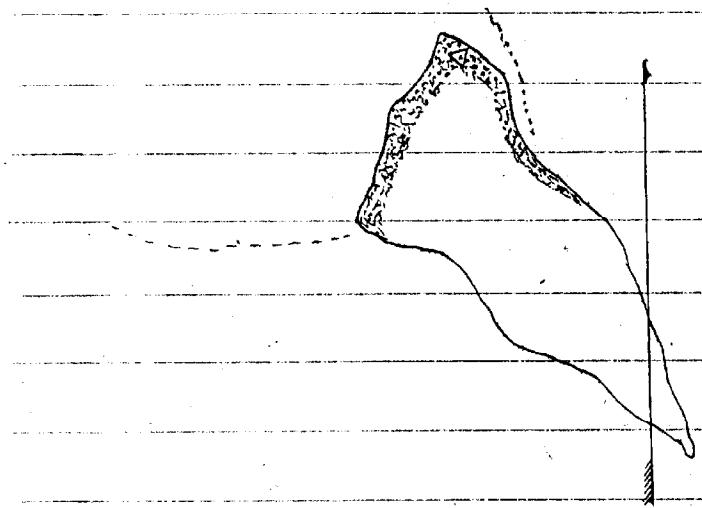
A second granite monument was found unimplanted, and was placed alongside the one marking the point.

Water around island very shallow; bottom covered with large flat pieces of detached rock - honey-combed.

The original mark not disturbed.

Erected signal stick over the point.

Delta Johnson: Visited March, 1888.



This  $\Delta^m$  point is situated on the North point of Little Johnson Key. It is about 150 meters from the end of the point, by about 50 meters from the northern shore. The point is marked by a granite monument, so  $\boxtimes$  (plan). There is a dense growth of mangroves all along the shore, but in the vicinity of the  $\Delta$  there are but a couple of straggling bushes. A flat makes out from the northern and western portions of the Key, and there is no good landing; the best however, is probably right abreast of the  $\Delta^m$  on the north shore, where a whale boat may come up close to shore at high water.

5  
286  
Δ Snipe Pt.

Visited April, 1888.



Δ Snipe Pt. is located on the extreme end of point of same name. It is marked by a square hole cut in the rock, with a nail in the center. Four nails are driven into the rock, each about a meter from Δ, forming the corners of a square. There are also several square holes cut in the rock, showing that originally, there must have been a tripod and scaffold. The point at high water is separated from main land of island.

A whale boat may approach close to the Δ at high water, but at low water the reef is awash.

Hydrographic Sta of this line completed in 1858

50.0 point W.S. Windward from Cape Romano Buoy, thence to the Buoy (cont'd)

40 x 51  
49  
45

25° 30'

25° 00'

24° 30'

88° 00'

87° 30'

87° 00'

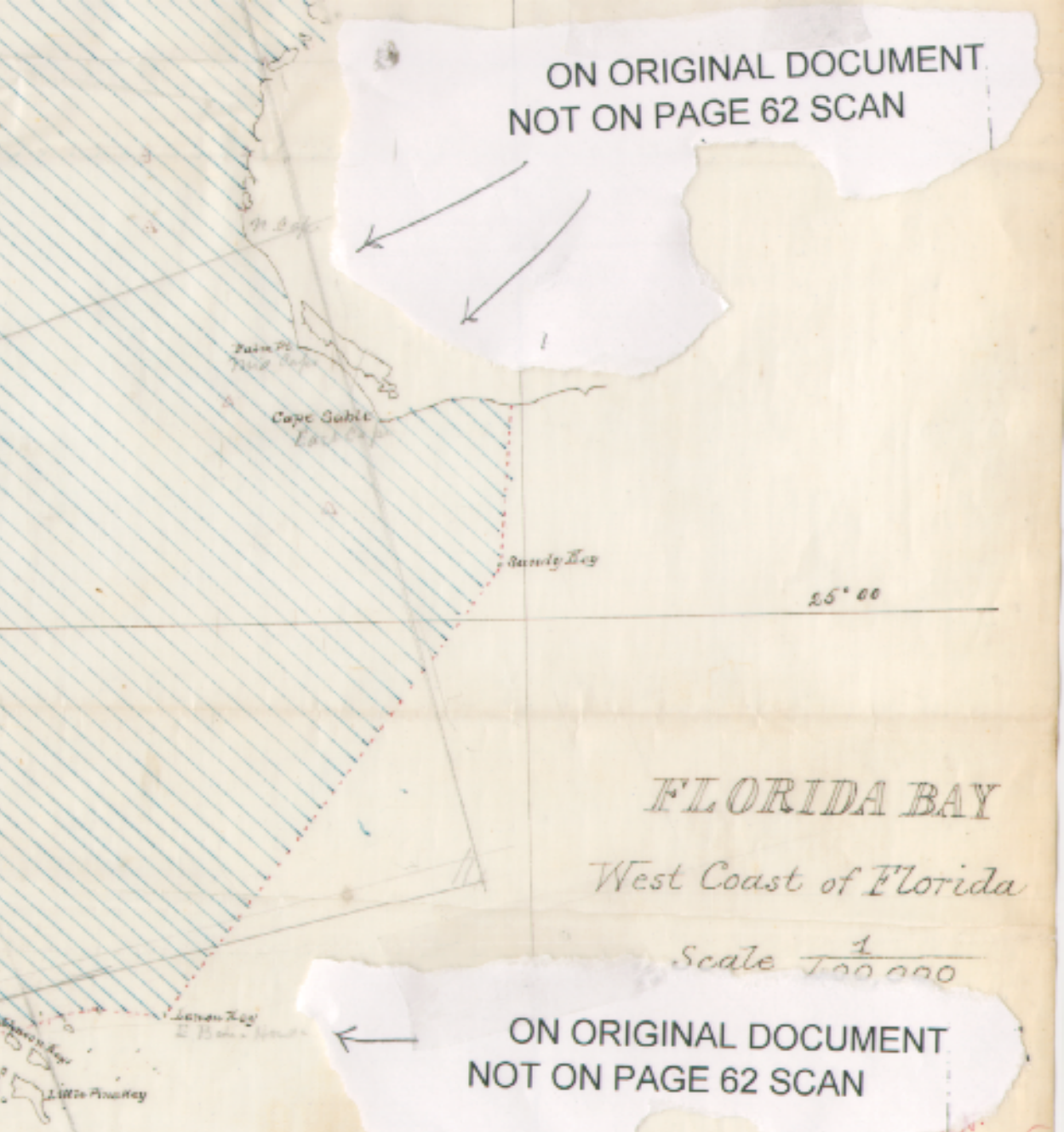


**FLORIDA BAY**  
 West Coast of Florida  
 Scale  $\frac{1}{400,000}$

*Report of Lieut. J. P. Mont, U.S.N.  
 Comdg. Steamer Albatross  
 Winter - 1858*



ON ORIGINAL DOCUMENT  
NOT ON PAGE 62 SCAN



*FLORIDA BAY*

*West Coast of Florida*

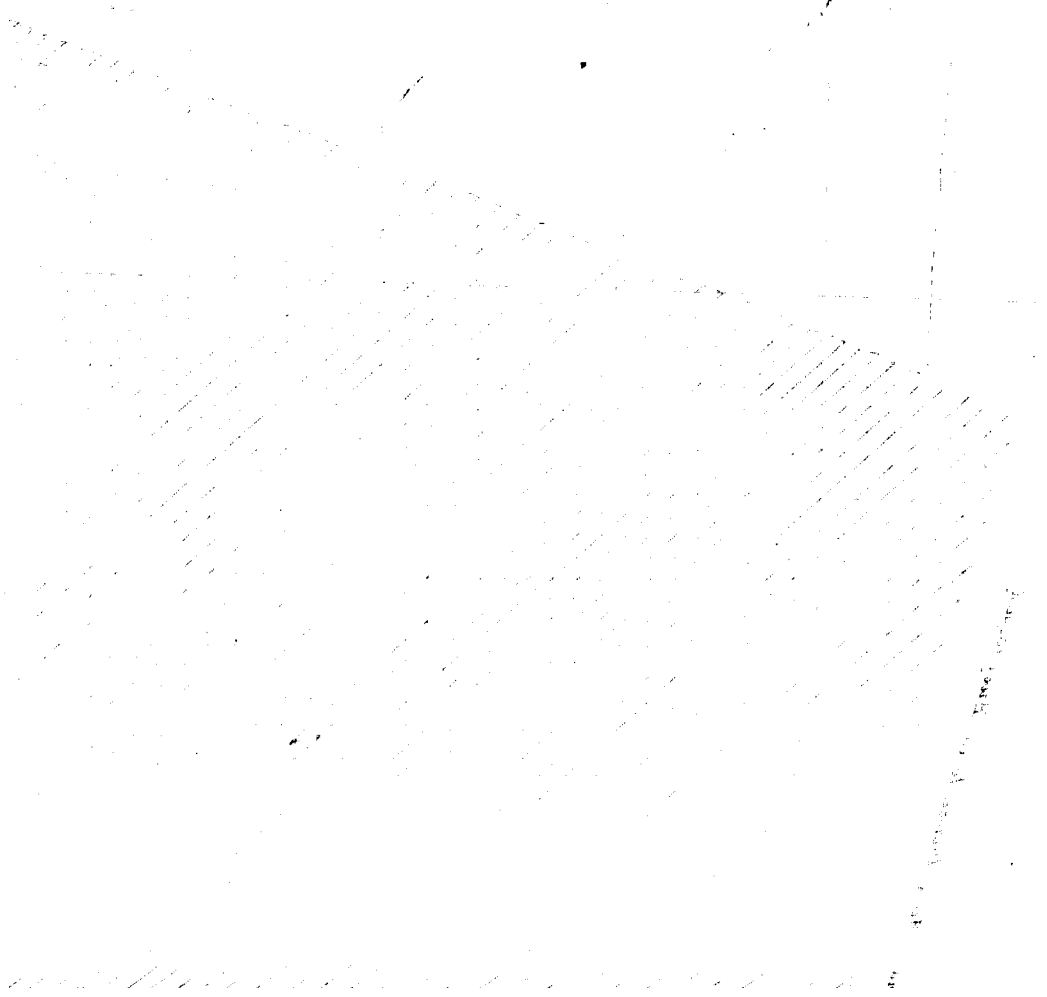
Scale  $\frac{1}{100,000}$

ON ORIGINAL DOCUMENT  
NOT ON PAGE 62 SCAN



*Sketch of locality, showing limits of work*

↑  
ON BACK OF ORIGINAL  
DOCUMENT PAGE 62



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# Soundings: Florida Bay, West Coast of Florida Projection No. 1.

Date 1888	Letter	Number of —			Name of Vessel.	Observers
		Book	Miles Naut.	Sound- ings		
Jan. 24	A	1	80.37	755	39	Ship Lieut. Moser & Ensign Hulme
" 25	B	1	44.45	477	32	"
" 31	C	1	65.63	605	7	" & " Swift & Bispham
Feb 3	D	2	86.40	1149	44	" & " Bispham & Evans
" 4	E	3	127.99	1384	46	" " " " " "
" 6	F	4	39.72	516	24	" & " Swift & Bispham
" 9	G	5	84.50	1240	16	" " " & Evans
" 10	H	4	42.90	520	26	" & " Hulme
" 11	I	2	41.53	543	24	" " Swift & Evans
" 15	J	3	49.37	560	3	" & " Hulme Bispham & Evans
" 17	K	5	72.64	827	13	" & " Bispham & Evans
" 25	L	4	42.00	528	13	" & " Hulme
Mar 1	M	4	48.68	553	6	" & " Swift, Hulme & Bispham
" 7	N	2	44.92	513	20	" & Tay. Geo. Dunn.
" 14	O	5	57.04	500	2	" & Ensign Swift & Bispham
" 15	P	6	45.53	607	16	" & " " " & Evans
" 21	Q	6	81.08	775	6	" Ensigns Swift, Hulme, Bispham & Evans
Apr 10	R	7	53.10	507	2	" Lieut. Moser & Ensign Swift, Bispham & Evans
" 11	S	7	20.93	271	12	" Ensigns Swift & Evans
" 23	T	6	37.05	287	4	" Lieut. Moser & Ensign Hulme & Bispham
" 25	U	8	48.05	812	26	" " & " " " "
" 29	V	8	52.21	833	85	" " & " " & Evans
May 2	W	7	48.23	627	120	" " " " "
" 3 & 4	X	8 & 9	113.44	938	18	" " & " Swift, Hulme, Bispham & Evans
" 5	Y	9	41.80	344	12	" " " " " "
" 8 & 10	Z	9	64.41	616	142	" Ensigns Swift, Hulme, Bispham & Evans
Total on Sheet.			1533.97	17,287	758	

Report of Lieut. J. T. Moser, U.S.N.  
Commanding Steamer A.D. Bach  
Winter 1888

Soundings:—Florida Bay, West coast of Fla.  
Proj. No. 2 (Parilion Key to N.W. Cape)

Date 1888	Letter	Number of —			Name of Vessel	Observers	
		Book	Miles (N)	Soundings			Angles
Jan. 23	A	1	30.00	467	118	Ship	Lieut. Moser & Ens. Hulme
" 25	B	1	32.00	471	118	"	" " " "
" 27	C	1	20.50	288	72	"	" " " Evans
Feb. 1	D	2	50.68	714	172	"	" " " Hulme
" 2	E	2	68.11	956	196	"	" " " "
" 8	F	3	67.81	940	190	"	" " " "
" 10	G	3	21.00	299	72	"	" " " "
" 11	H	2	16.34	198	38	"	" " " Swift & Evans
" 16	I	3	31.76	472	78	"	" " " Hulme
" 23	J	4	48.16	737	132	"	" " " "
" 24	K	5	29.75	475	110	"	" " " Swift
			416.11	6017	1296		
Jan. 21	a	1	37.25	1636	200	Stim. launch	Ensigns Swift & Bispham
" 23	b	2	36.00	1292	158	"	" " " "
" 24	c	1 3	26.00	1033	138	"	" " " "
" 27	d	2	15.20	716	94	"	" " " "
" 28	e	3	8.60	506	46	"	" " " "
Feb. 1	f	4	32.60	1237	144	"	" " " & Evans
" 2	g	3	30.00	1328	164	"	" " " "
" 8	h	4	28.80	1219	144	"	" " " & Bispham
" 10	i	5	27.30	1191	140	"	" " " "
" 16	k	6	28.50	1188	136	"	" " " & Evans
" 23	l	5	36.50	1404	151	"	" " " & Bispham
" 25	m	6	23.20	842	106	"	" " " "
			329.95	13592	1621		
Jan. 23	a	1	15.60	1391	133	Whale boat.	Ensign Evans & Pay. Yeo. Dunn
" 24	b	2	17.20	1078	138	"	" " " "
" 25	c	1	13.70	832	88	"	" " " "
Feb. 1	d	2	9.00	490	41	"	" Bispham & " "
" 2	e	3	9.30	763	87	"	" Evans & " "
" 8	f	2	13.20	1004	82	"	" " " "
" 10	g	3	13.10	847	82	"	" " " "
" 16	h	4	9.50	590	36	"	" Bispham & " "
" 23	i	3	15.60	888	55	"	" Evans & " "
" 25	k	4	6.80	469	42	"	" " " "
Mar. 5	l	4	9.70	512	57	"	" Bispham & " "
			132.70	8864	841		

Recapitulation				
	416.11	6017	1296	Ship
	329.95	13592	1621	Stim. launch
	132.70	8864	841	Whale boat
Total on Skt	878.76	28,473	3758	

Report of Lieut. J. J. Moser, U.S.N.  
Comdg. Steamer "Beche"  
Winter, 1858.

Soundings: Florida Bay, West Coast of Florida  
 Proj. No. 3 (U.W. leads to Content Key.)

Date 1888	Letter	Number of			Name of Vessel	Observers
		Book	Miles Naut.	Sound- ings		
Feb. 25	A	1	37.46	520	118	Ship Lieut. Moser & Ens. Hulme
Mar. 2	B	2	10.31	164	37	" " & Pay. Yeo. Dunn
" 6	C	1	53.36	767	159	" " " "
" 16	D	2	57.10	856	179	Ensigns Swift, Hulme, Bispham & Evans
" 17	E	1	33.09	511	95	Lieut. Moser & Ens. Hulme
" 19	F	2	39.59	633	45	" " " "
" 20	G	3	64.92	1002	87	Ensigns Swift, Bispham & Evans, & Pay. Yeo. Dunn
" 24	H	3	55.18	866	130	Lieut. Moser & Ens. Hulme
Apr. 12	I	4	21.47	342	71	" " " "
" 13	J	5	49.75	809	130	" " " " & Bispham
" 16	K	4	63.76	1068	158	" " " " & Evans
" 20	L	5	75.90	1214	140	" " " "
			561.89	8752	1349	
Feb. 25	a	1	14.75	555	78	Stn. Launch Ensigns Swift & Bispham
Mar. 2	b	2	25.00	954	128	" " & Evans
" 3	c	1	4.30	222	30	" " " "
" 5	d	2	39.10	1585	176	" " " "
" 6	e	1	29.40	1020	149	" " & Bispham
" 7	f	3	28.00	1159	125	" " " "
" 17	g	1, 3, 4	22.10	1028	129	" " & Evans
" 19	h	3	12.00	415	52	" " & Bispham
" 24	i	4	17.30	647	90	" " " "
Apr. 3	k	3	20.80	777	112	" " " "
" 4	l	5	27.00	1061	128	" " " "
" 5	m	4	4.20	176	26	" " " "
" 6	n	5	22.60	947	124	" " " "
" 7	o	4	21.60	877	116	" " " "
" 11	p	6	16.00	578	93	" " & Evans
" 12	q	7	27.40	1155	174	" " " "
" 13	r	6	22.00	996	146	" " " "
" 16	s	7	8.70	327	41	" " & Bispham
" 18	t	6	2.00	67	8	" " " "
" 19	u	7, 8	29.10	1081	152	" " " "
" 20	v	6, 9	29.70	971	150	" " " "
			423.05	16,598	2227	
Feb. 25	a	1	2.40	195	18	Whale boat Ensign Evans & Pay. Yeo. Dunn
Mar. 17	b	2	8.20	528	76	" " Bispham & " "
" 19	c	1	12.10	1474	149	" " Evans & " "
" 24	d	2	9.80	791	73	" " " "
Apr. 3	e	1, 3	15.10	992	106	" " " "
" 4	f	2	15.40	1128	118	" " " "
" 5	g	3	16.10	598	75	" " " "
" 6	h	4	24.20	1264	104	" " " "
" 7	i	3	14.60	983	105	" " " "
" 12	k	4	18.50	1274	132	" " Bispham & " "
" 18	l	5	4.80	222	32	" " Evans & " "
" 19	m	6	9.20	618	64	" " " "
" 20	n	5	15.40	1098	132	" " " "
May 2	o	6	4.00	130	28	" " Lieut. Moser & Ens. Hulme
			169.80	11,295	1212	
Total on Sheet.			1154.74	36,645	4788	
					Ship	Report of Lieut. J. F. Moser, U.S.N. Comdg. Steamer A.S. Bache Winter, 1888
					Stn. Launch	
					Whale boat	

Soundings: Florida Bay, West Coast of Florida  
Proj. No. 4 (Content Key to N.W. Passage Light)

Date	Letter	Number of —				Name of Vessel	Observers.
		Book	Miles Saut.	Soundings	Angles		
1888							
Apr 30	A	1	30.70	532	136	Ship	Lieut. Moser & Ens. Hulme
May 1	B	1	55.20	950	218	"	" " " "
" 3	C	2	21.50	351	95	"	" " " " & Bispham
			107.40	1833	449		
Apr 25	a	1	15.00	612	111	Stm. Launch	Ensigns Swift & Evans
" 30	b	2	15.00	574	103	"	" " & Bispham
May 1	c	1	11.00	413	68	"	" " "
" 2	d	2	23.50	819	155	"	" " "
			64.50	2418	437		
Apr 25	a	1	9.90	796	90	Whale boat	Ensign Bispham & Lay. Leo. Dunn
" 30	b	2	16.30	1370	103	"	" Evans & Sea. Veith
May 1	c	1	10.90	926	32	"	" " " "
" 2	d	2	9.60	790	72	"	" " " "
" 10	e	1	4.50	273	33	"	" Bispham & " "
			51.20	4155	330		

Recapitulation				
	107.40	1833	449	Ship
	64.50	2418	437	Stm. Launch
	51.20	4155	330	Whale boat
Total on Sheet	223.10	8406	1216	

Report of Lieut. J. T. Moser, U.S.N.  
Sounding steamer U.S.S. Beaker  
Winter 1888

Soundings: *Grand Recapitulation*  
*Florida Bay, West Coast of Florida*

Name of Vessel	Number of —		
	Miles, Naut.	Soundings	Angles
Ship	2619.37	33889	3852
Steam launch	817.50	32608	4285
Whale boat	353.70	24314	2383
Grand aggregate	3790.57	90811	10520

*Report of Lieut. J. P. Mason, U.S.N.*  
*U.S. Fish Com. - U.S. Fish Comm.*  
*Winter 1888*

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Signats: Florida Bay, West Coast of Florida

<i>Directed</i>	<i>Occupied</i>	<i>Determined</i>
53	52	56

Report of Lieut. J. F. Moser, West  
Florida Steamer Co. St. Paschal  
Winter 1888

Number of days on station and how employed

No. of days on station	122
" " " " which hydrographic work was done	61
" " " presented from work by bad weather	21
" " " " " " " other causes	9
" " " on which signals were built &c	15
" " Sundays (Exclu. of one on which hydrographic work was done)	16

Report of Lieut. J. F. Meyer, U.S.N.  
 Comd'g steamer Albatross  
 Winter - 1888



## List of officers and men attached to party

Lieutenants	1
Ensigns	4
P. A. Surgeon	1
Asst Engineer	1
Master-at-Arms	1
Pay Yeoman	1
Machinists	4
Ship's Writer	1
Carpenter's Mate	1
Boatswain's Mate	1
Quartermasters	4
Ship's Cook	1
Cabin Cook	1
Cabin Steward	1
2 <sup>nd</sup> Class Firemen	4
Scamen	15
Landsmen	3

Report of Lieut. J. F. Moser, U.S.N.  
 Comdg. Steamer U.S. Schooner  
 Winter 1858