

X.—THE HALIBUT FISHERY.—DAVIS' STRAIT.

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ANALYSIS.

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* The following article is the result of a trip taken, in 1879, upon a Gloucester fishing vessel. Professor Baird, convinced that it would be one of the best methods of collecting information respecting the sea-fisheries, sent representatives of the United States Fish Commission upon some of the regular fishing trips of the Gloucester vessels, to note and report everything of interest. With this object in view, the writer was sent on the fishing vessel Bunker Hill, Capt. John McDonald, bound to Davis' Strait for halibut.

It was decided that, since the Davis' Strait fishery formed a fishery by itself, it would be better to write its history up to the present time than to confine this report to the trip of the Bunker Hill.

The writer acknowledges with pleasure his indebtedness to Mr. R. E. Earll, then in charge of the Fish Commission station at Gloucester, for his kindness in arranging for comfortable quarters and outfit; to Mr. A. Howard Clark, for notes of statements of fishermen and others relating to this fishery, and to Capt. J. W. Collins for many valuable suggestions. Nor would he forget to mention with gratitude the kindness and aid of the fishermen with whom he was brought into so intimate contact. The captain offered every advantage in his power, consistent with the interest of the fishery, and the rest were equally generous. There is probably no class of men more generous and self-denying than the Gloucester fishermen, and recent events only confirm this statement.

A.—GENERAL DISCUSSION OF THE FISHERY.

I.—OUTLINE HISTORY.

Reports of the abundance of halibut off the west coast of Greenland were first brought to Massachusetts by Provincetown whalers. The first trip to Greenland after these fish was made in 1866 by the schooner John Atwood. She sailed June 29 and returned October 14, stocking \$5,500. Capt. G. P. Pomeroy, of New London, went as navigator, and Capt. Averill L. York, of Gloucester, as fishing master. Though she failed to fill her hold, only because of her late arrival upon the fishing banks, no enthusiasm was excited in this fishery until Capt. John McQuinn, in 1870, brought from Greenland a trip of fitched halibut, worth over \$19,000. Each of the two or three succeeding years, five or six vessels, with hopes of having like success, were fitted out for the same place. But, for some reason or other, the fish were not caught in very extravagant quantities, and a fall in the price of the fish rendered such a long trip financially rather uncertain. Besides, as there was no reliable chart of Davis' Strait and the coast of Greenland, the fishermen hesitated considerably before undertaking a voyage to such a precipitous and barren coast; and no one can blame them. Once give them a good chart of the coast and harbors of Western Greenland, and their greatest difficulty will be removed. No reliable survey and chart of Greenland have been made.

Notwithstanding the need of large and accurate charts and the immense distance of two thousand miles, so great are the probabilities of making a profitable catch, that thirty-one trips have been made from Gloucester to Davis' Strait after halibut. The following is a tabular view of the vessels and captains engaged in the Greenland fishery from its beginning to the present time, showing the year and weight of fitches for each trip. This gives a total of 3,283,765 pounds of salt halibut brought to Gloucester from Greenland, or an average of 113,233 pounds for the vessels that returned in safety.

Year.	Vessel.	Captain.	Pounds of fish.
1866	John Atwood	George Pomeroy	60,000
1869	Caleb Eaton	John McQuinn	134,400
1870	Caleb Eaton	John McQuinn	177,800
1871	Membrino Chief	John McQuinn	429,200
1871	Caleb Eaton	Jeremiah Hopkins	
1871	River Queen (lost)	George Robinson	
1871	Thorwaldsen	James Hamilton	
1871	William S. Baker	Albion Pearse		150,800
1871	Mary E	Rasmus Madson	30,000
1872	Aaron Burnham	Charles J. Lawson	112,000
1872	Thorwaldsen	Henry Hamilton	145,000
1872	William S. Baker	Albion Pearse	145,000
1872	Membrino Chief	John McQuinn	134,400
1872	Carrie Jones	John Guskill	112,000
1872	Caleb Eaton	Jeremiah Hopkins	134,400
1873	Aaron Burnham	Charles J. Lawson	91,000
1873	William S. Baker	Albion Pearse	75,700

Year.	Vessel.	Captain.	Pounds of fish.
1873	Caleb Eaton	Jeremiah Hopkins	62,500
1873	Albert Clarence	John Guskil	51,000
1874	Nulli Secundus	Charles J. Lawson	163,000
1877	Henry Wilson	James Jamisen	91,000
1878	Grace L. Pears	Randall McDonald	60,000
1878	Cunard (lost)	Garrett Galvin	.....
1878	Bellerophon	Thomas Scott	60,000
1879	Herman Babson	Charles J. Lawson	140,000
1879	Bunker Hill	John McDonald	140,000
1879	Mary E.	Rasmus Madsen	75,000
1880	Mary E.	Rasmus Madsen	70,000
1881	Herman Babson	Charles J. Lawson	108,400
1881	Mary E.	Rasmus Madsen	84,880
1881	Bunker Hill	John McDonald	179,575
	Total	.....	3,283,703
	Average for vessels returning.	.....	113,233

Two vessels were lost, but one of these, the Cunard, after starting for home, went to the Grand Banks and was lost there, leaving only one lost in the Greenland fishery. The River Queen probably failed to reach home because too little care had been taken in properly arranging the salted fish, thus throwing the vessel considerably out of trim. The last seen of her she was rather low in the bow, and sailing before a northeast gale, on her way home.

2.—GENERAL SUMMARY.

If one compares this fishery with that of the Grand Banks there is much in its favor. The water is not so deep, and fogs are not so frequent as on the Grand Banks. Good harbors are available in case of storms, which are not common. The climate is excellent, neither very cold nor very warm. The continual light permits fishing at all times of the day, and does away with much of the risk of the dories losing sight of the vessels. One great objection is the long distance from home, and lack of opportunities of hearing from the outside world. The fish, however, are plentiful, and, if the fishermen only had accurate charts of the banks of the west coast of Greenland and of the harbors of Sukkertoppen and Holsteinborg, the long distance would be little thought of, as they would then be quite sure of a profitable catch. The harbor of Holsteinborg is usually open by the middle of May and perhaps fishing could be commenced by the 1st of June, but the ice, brought by the current down the east coast of Greenland, besides blocking up the more southern harbors, will probably render the passage north too dangerous before the middle of June. On this account and because of the change in the weather about the 20th of August, the fishing here will have to be done in July and August.

Besides the halibut, the common cod is also caught on the trawls of the fishermen, but not in sufficient numbers to warrant their being salted. The proportion of cod to halibut is about 1 to 15. The Eskimo fish for both in the bays and harbors, and the cod may be more plentiful there, but they are likewise smaller.

\ | The fine salmon of the coast might afford profitable fishing. This opinion is founded upon the quantity of these fish the natives catch with their rude appliances, and sell for \$4 to \$8 a barrel to the Danish trade agents. If the American fishermen were acquainted with the deep fiords, and should engage in this fishery with all the modern improvements for seine fishing, they would probably meet with great success. There is, however, this probable limit: the fish are caught mostly in June and July when they visit the mouths of the fresh-water creeks. After this they become scarce, but, if the fishermen do not succeed in securing a cargo of salmon, they have at least a month, after the salmon season is over, during which they can set their trawls for halibut.

The average of 113,233 pounds of salt halibut for a trip is a good average, but does not represent fully what the fishery may become in the future. For, several of the trips were made the conclusion of cod-fishing trips to the Grand Banks, and the vessels were already partly filled with cod, leaving not enough room for a *full* cargo of halibut. Thus the *Mary E.*, in 1871, '79, '80, and '81, fished first on Flemish Cap, and from *there* went to Greenland. In 1871 she did not reach the Davis Strait fishing-ground until August 20, and left off fishing August 28, but during these eight days she secured 30,000 pounds of halibut. In 1879 the Herman Babson had on board 60,000 pounds of codfish, which she brought from the Grand Banks. If we omit from our calculations the *Mary E.*, which is comparatively a small vessel, the above average will be increased to nearly 121,000 pounds for each trip.

Again, since the fishermen first visited Davis' Strait, the methods of fishing in that region have altered considerably, principally because the first fishermen were unacquainted with the fishing banks, and were afraid to remain on them whenever the wind showed signs of increasing to a gale. Because of this, visits to the harbor were frequent, and much time was lost in regaining the banks after the blow was over. The custom now is to remain on the banks as much as possible, and to fish at every opportunity, and, had this method been employed from the start, the average would have been considerably larger.

The success of the *Bunker Hill*, in 1881, proves this beyond a doubt. This vessel, though not arriving upon the banks until July 11, commenced fishing before going into the harbor, and by persistent effort, in spite of unfavorable weather, secured the largest fare of any vessel since the beginning of the fishery.

In the future, competition among the fishermen will become greater, knowledge of harbors and fishing banks more definite and wide-spread, improved methods of fishing will be introduced, and, as the demand for the fish and the confidence of the fishermen increase, the Greenland halibut fishery will grow until it may even rival in importance the summer fishery of the Grand Banks.

B.—FISHING GROUNDS.

3.—LOCATION AND CHARACTER.

The fishing banks are fifteen to forty miles from the coast and, if we can rely upon the Danish charts, extend from Disko Bay to within 3° of Cape Farewell; for these charts give soundings all along the coast between these two points. Extensive as the banks may be, only a small part of them, the part about Holsteinborg and Cape Amalia, has been tried by American fishermen. That the fish are to be found throughout their whole extent is more than probable; for the species is identical with that taken on the Grand Banks, and we would naturally infer it would be found in all favorable situations within the limits of its distribution. It is also reported that Capt. Rasmus Madson, commonly known as "Captain Hamilton," who has been to Greenland several times, set his trawls for these fish farther to the south (probably off of Godthaab) and found them very abundant, but was unable to secure many on account of the numerous ground-sharks playing the mischief with his trawls.

At Cape Amalia are the favorite fishing-grounds of the natives, and a few of the Gloucester vessels have visited them, but, as the fishing there is mostly by anchoring in the harbor and sending the dories a distance of two or three miles, this place does not offer many inducements to our fishermen. The best luck has attended the vessels fishing off and to the south of Holsteinborg.

Previous to 1872 the fishing-grounds were 4 or 5 miles off Holsteinborg. That year, however, some of the fleet went 30 miles off this settlement, and since that time most of the fishing has been done on this latter ground.

In 1879, the fishing in July was on this ground, but in August better fishing was secured on a new ground 20 miles south of this. In 1881 the best fishing was found in the vicinity of Victori Island, some 15 miles from shore, in water from 14 to 28 fathoms deep.

Between the old ground off Holsteinborg and Victori ground there is a gully over 150 fathoms deep and 15 or 20 miles wide, and there is probably another gully south of Victori ground.

The depth of water on the banks is from 15 to 90 fathoms and, on this account, the fishing is much easier than in the deep water of the Grand Banks. At the inner edge the banks have a sudden slope, leaving a long submarine valley, the depth of which I did not ascertain, between them and the mainland. The surface of the banks is varied, though generally rocky, with here and there sandy and clayey spots.

The character of the fauna varies considerably and often abruptly in places a little distance apart, as the following extract from my diary of the 25th of July will show: "The fish caught to-day and two preceding

days have not been taken on all sides of the vessel, but in one particular spot, where the bottom is more attractive than elsewhere. This spot is covered by *tunicata* called 'sea-lemons' and 'sea-pumpkins.' The moment the trawls strike the bottom covered by the stems of *hydrozoa*, by the crew called 'trees,' the fish are no longer found in any quantity."*

It will readily be seen from the preceding remarks that a careful survey of the banks, with the view of determining their limits, character, and fauna, could not fail of being of great use to the fishing interest, to say nothing of its immense importance, from a natural history and geological point of view.

4.—CLIMATE.

The climate on the banks for July and August is, on the whole, very favorable for fishing. In the tables that follow I have omitted observations made in the harbor, in order to avoid confusing the two climates together, for there is considerable difference. The climate on the banks is more constant in temperature and absence of rain, but more variable in respect to wind.

The temperature is very constant. The lowest observed was 36° Fahr. and the highest 52° Fahr. The extremes of surface temperatures were 38½° and 43¼° Fahr. There were no sudden changes, as the tables will show. The temperature was thus very favorable for work, though perhaps a little chilly in foggy weather, but nevertheless much better than the sweltering heat of summer in our own latitude. The men even found, on sunny days, a temperature of 48° Fahr. uncomfortably warm for work. On chilly days a fire was kept in the cabin, so that all could keep comfortable when not working.

A reference to the tables of the condition of the sky will show that we had very little rain on the banks. Clouds were common and fogs not rare, but it only rained four or five times, and then mostly in the shape of fine, misty rain, lasting at the longest only four or five hours.

The tables of the wind need explanation. The directions expressed are those of the compass, which here varies about 70°; for not knowing the exact variation, I thought this the best way of expressing them. The estimations of the velocity is much of it guess-work, founded on remembrance of former estimates and comparisons of the wind's velocity made by myself, and, on this account, not much reliance can be placed on them except for the relative velocities of the winds observed. The hardest blow was August 14, on which day I have put the velocity down as between forty-five and fifty-five miles, and am well satisfied it could not have been any greater. Between this and a perfect calm I have used six numbers to designate as many different velocities: 2 for air just perceptible; 5 for a breeze of three to ten miles an hour; 13 for a breeze of ten to fifteen miles an hour; 20 for a breeze of fifteen to twenty-five miles an hour; 30

* I regard the occurrence of the *tunicata* and *hydrozoa* as not immediately, if at all, casual, but rather concomitant, for I failed to find traces of either in the stomachs of the fish.

for a breeze of twenty-five to thirty-five miles an hour; 40 for a breeze of thirty-five to forty-five miles an hour; and 50 for a breeze of forty-five to fifty-five miles an hour.

The temperature, sky, and winds were quite different in the harbor. The land on all but the sea side of the harbor rises abruptly and not only protects it from the winds, but also permits the sun to warm the surface of land and water more than in an exposed place. The thermometer is, therefore, more variable than in the strait, and the wind is seldom felt. The mountains, by causing the condensation of the vapors of the sea breezes, make fogs and showers frequent.

I have also given tables of the height of the barometer, made from an aneroid belonging to the captain. This was hung up in the cabin and I noticed considerable variation in the instrument whenever a fire was built there. When this variation was very marked, I have indicated the same in the tables by an asterisk.

The season of 1879 was, however, uncommonly mild for Davis' Strait, and the weather that summer more favorable for fishing than it has been since. In 1880 the Herman Babson was started for Greenland, but was turned back in 52° N. lat. by immense quantities of icebergs and field ice. The Mary E. succeeded in getting through by going farther to the eastward.

In 1881 the three vessels that went to Davis' Strait skirted the ice 200 to 300 miles before succeeding in getting through, and, even after reaching the fishing-grounds, they were obliged several times during the summer to change their positions on account of drifting bergs.

This ice is carried by the currents down the east coast of Greenland, and thence across to the Strait of Belle Isle, and the fishermen will probably encounter more or less of it every year.

TABLE OF THE TEMPERATURE FOR JULY.

[Expressed by the Fahrenheit scale—all positive.]

	Midnight.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 P. m.	2 P. m.	3 P. m.	4 P. m.	5 P. m.	6 P. m.	7 P. m.	8 P. m.	9 P. m.	10 P. m.	11 P. m.
July 1	0																							
2	0							37½	37½	38	37½	38	38½	38½	39	39	39	38½	38½	37½				
3																								
4																								
5	39							41	42	45	44	43	44	43	42½	38	38	37	37	41½		40		
6																				36½	36½			
7	36											39	39½	39½	41½	41	41	40½	39½	38½	39½			
8											45½	41½	40						38½	38½	38½			38½
9												38½												
10																								
11								45	44															38½
12																								
13													49	48½	48	48½		46½	44½	41		39	38	
14										42½				39½	39½	39		39	39					
15																								
16																								
17																								
18																								
19							40	40½	41		41		42											
20																								
21																								
22																								
23												40	40½	42½	44	44½	45½					48		
24											42½	42½	42½	44	44½	45½								
25									45½	45	45	46	46	46½	44	44	44	44	42½	42		41		
26									39½	40		40	40		41	41	41	40½						
27								40	40½	41½	42½			43			41½							
28								41½	40½	42½		43½	42½	44½	43½					41½				
29								42½	42½			42½	43											
30											40½		43			44	44	44	44½					
31																								

No observations made in harbor.

TABLE OF THE TEMPERATURE FOR AUGUST.

(Expressed in the Fahrenheit scale—all positive.)

	Midnight.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.
Aug. 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2																								
3										45	45	45		45½	45½	45½	45½	45½	45½	44½	44			
4									44	44	44½	45½	46	46½	46½	46½	46	46	46	44½	44½			
5									44	46	46½	47	47	47	46	46	46	46	46	48	45			
6						46	46	47		45½	45½	45½	47	47	47	48	47	47	47	46	45			
7										45½	45½	45½	47	47	47	48	47	47	47	46				
8										45½	46½	46½	47	47	47	48	47	47	47	46				
9										48	46½	46½	47	47	47	48	47	47	47	46				
10										44	44	44	44	44	44	44	44	44	44	44				
11									44											44				
12								45												44				
13									42											46				
14							40						41											
15							42		43															
16†																								
17†							38						39							42				
18																				42				
19																				47				
20																				42				
21								42					42											
22																								
23																								
24													40							40				
25							39½						40						39½					
26							40						41						41					
27							41												41					
28																								
29										42														
30							40						40						38					
31							40						41											

*Affected by reflection of sun's rays.

†Barrels lashed in front of thermometer so it could not be seen on the 16th and 17th.

‡Thermometer wet with spray.

No observations made in harbor.

TABLE SHOWING THE CONDITION OF THE SKY FOR JULY.

	Midnight.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	
July 1																									
2																									
3																									
4																									
5	o. m.						b.																		
6																									
7	o. m.												o.	f.											
8																									
9	c.												k.	b.											
10																									
11																									
12	f.	f.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	b.	f.
13	f.	b.	b.	b.																					
14																									
15	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.
16	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	f.	k.	b.									
17																									
18													k.												
19							o.	o.					o.							o.					
20																									
21																									
22																									
23													o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.
24																f.	f.								
25																									
26									m.	m.			o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.	o.
27																									
28								o.	o.	o.	o.	o.	o.	o.											
29								r.	r.	r.															
30																									
31											o.	o.	o.	o.	o.	o.	o.	o.	k.						

b. Blue sky. f. Foggy. m. Hazy, misty. r. Rain. o. Clouds, detached. g. Gloomy. o. Overcast. k. Clearing off.

No observations made in harbor.

TABLE SHOWING THE CONDITION OF THE SKY FOR AUGUST.

	Midnight.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 P. m.	2 P. m.	3 P. m.	4 P. m.	5 P. m.	6 P. m.	7 P. m.	8 P. m.	9 P. m.	10 P. m.	11 P. m.	
Aug 1																									
2														c	c	c, r	c	c	c, r	c, r	c, r				
3														c	c	c, r	c	c	c, r	c	c				
4														b, c	c	c, r	b, c	b, c	b, c	b, c	b, c				
5														c	c	c	b, c	b, c	b, c	b, c	b, c				
6						b	b	b, c						c	c	c	c	c	b, c	b, c	b, c				
7							o, f							c, m	c	c	c	c	b, c	b, c	b, c				
8														c, m	c	c	c	c	c	c	c				
9														c, b, m	c	c	c	c	c	c	c				
10														c	c	c	c	c	c	c	c				
11								o, m						c	c	c	c	c	c	c	c				
12								a						c	c	c	c	c	c	c	c				
13									m					c	c	c	c	c	c	c	c				
14					a									c	c	c	c	c	c	c	c				
15														c	c	c	c	c	c	c	c				
16								b						b											
17														c	c	c	c	c	c	c	c				
18														c	c	c	c	c	c	c	c				
19																									
20														b											
21														c, f											
22														b											
23														b											
24														c											
25														b											
26														b											
27																									
28														b											
29																									
30		r		r	r	a	c	c					b												
31														c											

b. Blue sky. f. Foggy. F. Thick fog. m. Hazy. r. Rain. c. Clouds detached. g. Gloomy. o. Overcast. k. Clearing off.

No observations made in harbor.

TABLE SHOWING THE DIRECTIONS AND RELA

	Midnight.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.
July 1												
2											E. by N. 20	E. by N. 20
3												
4												
5								SE. 2	SSE. 2	SSE. 2	SW. 5	SW. 5
6												
7	0											0
8											SE. 5	E. 5
9	WSW. 20											WNW. 20
10								0	0			
11												
12												
13	0	0	NE. 5									
14										W. by S. 5		
15												
16		ENE. 5										
17												
18												
19							SW. 20	WSW. 20			SW. 13	
20												
21												
22												
23												0
24											0	0
25									0	0		NE. 5
26									N. 13	NNW. 13	NNW. 13	NNW. 13
27									0	NW. 2	NW. 2	NW. 2
28								0	NE. 13	NE. 13		ENE. 5
29								S. by W. 5	S. by W. 5			S. by W. 5
30											0	0
31												

Calm by 0.

Just perceptible, by 2.

3 to 10 miles, by 5.

No observations

TIVE VELOCITIES OF THE WIND FOR JULY.

Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.
E. by N. 20	NE. 20	NE. 20	NE. 20	NE. 20	NE. 20	NE. 20					
			ENE. 5	ENE. 2	ENE. 2						
NNE. 13	NNE. 13	NNE. 13	NNE. 20	ENE. 20	ENE. 20						
SW. 5	SW. 5	SW. 5	SW. 5	SW. 5	SW. 5	SW. 2		WNW. 20			
	NE. 13		NE. 5			NNE. 5					
0	SW. 5	SW. 5	SW. 5	SW. 5		0	0				ENE. 5
		NE. 13	NE. 13	NNE. 13	NNE. 13	NE. 18	0		SW. 13		
WNW. 18				0	ESE. 13						
WNW. 5	WNW. 5	WNW. 5	WNW. 5	W. 13	W. 13	W. by S. 13	W. 20	W. 20			
								NE. 13			
	NE. 5	NB. 5	NE. 5	NE. 5	NE. 5	NE. 13		NE. 5		ENE. 5	
			NE. 13					NE. 13			
						WSW. 20					
			SW. 2								
0	0	0	0	0			0				
NE. 5	NE. 5			NE. 5	N. 13	N. 13	NNE. 13				
NNW. 13	NNW. 5	NNW. 5	NW. 5	NW. 5							
	N. 5			ENE. 5							
ENE. 5	NE. 2	NE. 2				0					
		0	0	0							
0	0	0	0		SW. 5						

10 to 15 miles, by 13.
made in harbor.

15 to 25 miles, by 20.

25 to 35 miles, by 30.

TABLE SHOWING THE DIRECTIONS AND RELA

	Midnight.	1 a.m.	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.
Aug. 1												
2											SW. 18	SW. 18
3								SW. 20		WSW. 20	WSW. 20	WSW. 13
4							0	SE. 2	SSE. 5	S. 5	SSW. 5	SW. 2
5								0			0	NNW. 5
6						E. 2	E. 2	S. 2		SW. 2	0	0
7							WNW. 2		0		0	
8									WSW. 5	W. 5	W. 5	W. 5
9										W by S. 5	W by S. 5	
10										SW. 80		
11								SW. 20				
12								SW. 5				
13									NE. 30			
14				NE. 50			NE. 50					
15							WNW. 30					
16								NE. 18				
17							NNE. 30					
18							ENE. 5					
19							WSW. 20					
20												
21							NE. 20					
22							NE. 30					
23							NE. 30					
24							NE. 20					
25							NE. 30					
26							NE. 20					
27												
28												
29									SW. 18			
30			0	NE. 5								
31				NE. 30								

Calm, by 0.

Just perceptible, by 2.

3 to 10 miles, by 5.

10 to 15 miles, by 18.

No observations

TIVE VELOCITIES OF THE WIND FOR AUGUST.

Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.
SW. 13	SW. 13	SW. 5	SW. 5	SW. 2	SW. 2	SW. 2	SW. 2	S. 2			
WSW. 18	W. 13	W. 5	0	0	0	0	0				
	0		E. 2	E. 5	E. 5	E. 5					
NNW. 13	N. 13	N. 13	N. 13			0		NE. 2			
NW. 2	0	0	0	0		0					
0			0				NE. 13				
0						0					
W. 5		W. 5		WbyN. 5		W. 5					
SW. 30						W. 30					
W. 13						W. 13					
ENE. 5					ENE. 5	ENE. 13			NE. 30		
NE. 40											
NE. 50						NE. 13					
NW. 20						0					
NNE. 13						NNE. 30					
NNE. 30						NE. 13					
0						WSW. 20					
NE. 13						ENE. 5					
NE. 20						NE. 20					
NE. 30						NE. 30					
NE. 30						NE. 30					
NE. 20						NE. 20					
NE. 30						NE. 30					
NE. 20						NE. 13					
						NNE. 13					
SW. 30						SW. 20					
NNE. 20						NE. 20					
NE. 30						NE. 20					
NE. 30						NE. 20					

15 to 25 miles, by 20. 25 to 35 miles, by 30. 35 to 45 miles, by 40. 45 to 55 miles, by 50.
made in harbor.

TABLE SHOWING THE HEIGHT OF THE BAROMETER FOR JULY.

	Midnight.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.
July 1																								
2								30.23	30.23	30.22	30.22	30.21	30.21	30.20	30.20	30.19	30.16		30.16		30.15			
3													29.78	29.78	29.76	29.82	29.83							
4								29.73	29.75	29.75	29.76	29.76	29.78	29.77	29.78	29.75	29.72		29.70	29.68				
5																			29.80					
6																30.05				30.11	30.11			
7											30.28	30.28	30.29	30.30	30.30					30.29	30.27			
8											30.19	30.18							30.08	30.07	30.08			30.20
9	30.05										30.37	30.37	30.39				30.13		30.08	30.40				
10																	30.41							
11								30.41	30.40															
12																								
13				30.46									30.30	30.30	30.30	30.32			30.40	30.50				
14										30.60														
15												30.43	30.43	30.45	30.40	30.43			30.42	30.38		30.52	30.50	
16	30.37	30.37																						
17																30.24								
18																								
19							30.25	*30.38			30.36		30.38							30.26				
20																								
21																								
22																								
23												30.46	30.44	30.43		30.48								
24											30.54	30.56	30.57	30.55	30.56	30.54	30.56				30.48			
25									30.50		30.44	30.42		30.37	30.36		30.46		30.42	30.43		30.40		
26									30.32	30.34		30.32			30.28	30.28	30.26		*30.38					
27								30.36	30.36		30.36	30.35		30.35			30.33							
28								30.24	30.26	30.24		30.24	30.20	30.20	30.20					30.26				
29								30.18	*30.30	30.28	30.26					30.25	30.26							
30											30.12		30.12		30.12	30.10				30.06				
31																								

*Due to building of fire in cabin.

TABLE SHOWING THE HEIGHT OF THE BAROMETER FOR AUGUST.

Aug.	Midnight.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.
1																								
2										30.02	30.04	30.04	30.05	30.04	30.04	30.04	30.06	30.14	30.15					
3								30.24	30.24	30.24	30.26	30.28	30.28	30.28	30.28	30.28	30.30	30.33	30.33	30.32				
4							30.37	30.36	30.34	30.34	30.36	30.28	30.40	30.40	30.40	30.40	30.36	30.40	30.32					
5							30.30	30.30	30.27	30.26	30.24	30.22	30.22	30.22	30.22	30.20	30.20	30.28	30.28	30.28	30.28			
6						30.24	30.26	30.24	30.27	30.26	30.24	30.24	30.24	30.26	30.28	30.28	30.32	30.32	30.28					
7							30.30	30.28	30.28	30.27	30.27	30.30	30.33	30.36	30.36	30.32	30.32	30.30	30.30	30.16				
8								30.28	30.27	30.27	30.30	30.33	30.38	30.38	30.36	30.32	30.32	30.30	30.30					
9								30.28	30.28	30.28	30.28	30.28	30.20	30.20	30.36	30.32	30.32	30.30	30.30					
10								30.06	30.28	30.27	30.30	30.33	30.38	30.38	30.36	30.32	30.32	30.30	30.30					
11								30.11	30.28	30.27	30.30	30.33	30.38	30.38	30.36	30.32	30.32	30.30	30.30					
12								30.06	30.28	30.27	30.30	30.33	30.38	30.38	30.36	30.32	30.32	30.30	30.30					
13								30.11	30.28	30.27	30.30	30.33	30.38	30.38	30.36	30.32	30.32	30.30	30.30					
14					29.80		29.74	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82	29.82
15							29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89	29.89
16							29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78	29.78
17							29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60
18							29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60	29.60
19							29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86
20													30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12
21								30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18
22								29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92	29.92
23													30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09	30.09
24							30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12
25							30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
26							30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02	30.02
27													30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22
28													30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22	30.22
29								30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18	30.18
30							30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06	30.06
31							30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12

*Due to fire in the cabin.

5.—TIDES AND CURRENTS.

I had hoped to construct tables that would give definite figures regarding the tides, but, on account of the frequent changes of position and the remarkable complexity of the currents, near the edge of the banks, this was impossible. The first peculiarity one would be likely to notice, is that the tide runs up the strait much longer and with greater velocity than in the opposite direction. In fact, some days there was no tide at all down the strait, but corresponding to it would be nearly slack water for seven or eight hours. The tide also, instead of changing every six hours, would only do so twice a day. The observations made August 4, will show this. The velocity is expressed in the number of feet a chip floated in a minute, and the directions are those of the compass. As this varies about 70° toward the west, it will be seen that all the directions given are up rather than down, the strait.

TIDE AUGUST 4.

6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	12 m.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.
NE. Slight.	NE. Gentle.	NE. Moderate.	NE.xE. 160 feet.	ENE. 179 feet.	E. 246 feet.	.....	E. x S. 168 feet.	.....	SSE. 185 feet.	SE.xS. 96 feet.	SE.xS. 90 feet.	SE. 60 feet.

The greater velocity of the tide running north compared with that going south, is probably due to the existence of a current on the east side of the strait running up the coast of Greenland. The slack water, of six or seven hours at a time, would then be when the current and tide just balanced each other. The few icebergs we saw while fishing came from the south. The harbors of Holsteinborg and Sukkertoppen are open much earlier than the more southern ones, owing to the ice that is brought round Cape Farewell, blocking up these latter. The existence of this southern ice will be a great barrier to the utilization of the southern fishing banks, making those about Sukkertoppen and Holsteinborg the ones most accessible.

The combining of the tide and current often renders fishing impossible five or six hours at a time, but, as the slack water is usually correspondingly long, the loss of time need not be very great, for, by careful observation, the fishermen can time themselves so as to sleep while the tide is strong and fish when it is slack water. It must be remembered, that in this latitude it is light enough in July to work all night without inconvenience.

The tides and currents are not, however, as simple as the preceding remarks would seem to imply. Often a changing of our position a few miles would bring us into a different combination of currents. The banks occasion variations in currents a few miles apart. The whole coast of Greenland is indented by deep fiords, three or more miles broad, and fifty to a hundred miles long; and the tides running out of these with great force have an influence miles from their mouths.

Temperature of the water, at every ten fathoms, on the Fishing Banks, off the west coast of Greenland, latitude 66° +. Time, July and August.

July 6. Latitude 66° 25'. Taken between 3 and 4 p. m., during the slack, after the tide had been running north.

	° Fahr.
Temperature of air.....	38
Temperature of surface.....	38½
Temperature of 10 fathoms.....	37½
Temperature of 20 fathoms.....	36½
Temperature of 30 fathoms.....	35½
Temperature of 40 fathoms, bottom.....	35½

July 7. Same place and time of day.

	° Fahr.
Temperature of air.....	40½
Temperature of surface.....	38½
Temperature of 10 fathoms.....	37½
Temperature of 20 fathoms.....	36½
Temperature of 30 fathoms.....	35½
Temperature of 40 fathoms, bottom.....	35½

August 2. Taken between 7.30 and 8 p. m.

	° Fahr.
Temperature of air.....	44
Temperature of surface.....	42½
Temperature of 10 fathoms.....	39½
Temperature of 20 fathoms.....	38½
Temperature of 30 fathoms.....	38
Temperature of 37 fathoms, bottom.....	37½

August 5. Taken between 7 and 7.30 a. m. Tide very slack.

	° Fahr.
Temperature of air.....	46½
Temperature of surface.....	41½
Temperature of 10 fathoms.....	38½
Temperature of 20 fathoms.....	38½
Temperature of 30 fathoms.....	38
Temperature of 35 fathoms, bottom.....	37

August 8. Taken 6 p. m. The time of slack different in places a few miles apart; likewise the force and direction of the current.

	° Fahr.
Temperature of air.....	45½
Temperature of surface.....	43½
Temperature of 10 fathoms.....	41
Temperature of 20 fathoms.....	38½
Temperature of 24 fathoms, bottom.....	37½

August 20. Taken between 8 and 8.30 p. m. Slight surface tide. About 40 miles W.S.W. from Holsteinborg.

	° Fahr.
Temperature of air.....	44
Temperature of surface.....	43
Temperature of 10 fathoms.....	41½
Temperature of 20 fathoms.....	39½
Temperature of 25 fathoms, bottom.....	38½

The preceding observations, though few, will show very well the temperature of the water on the banks at various depths.

6.—HARBORS.

The harbors of greatest use to the fishermen will be those of Holsteinborg and Sukkertoppen. Of the latter I can say nothing, except that it is reported, by those who have been there, as a good harbor. Holsteinborg, surrounded on three sides by the mainland and on the other by several islands, is completely protected from the rough water, and is only exposed to the wind on the side towards the strait, from which quarter there is scarcely ever a violent blow. The harbor is large, and has a depth of 10 to 25 fathoms. The harbors mentioned are ninety miles apart, and as the best fishing we had was about half way between the two, we could easily have run into one of them, whichever way the wind might have been.

Previous to the summer of 1879, which was considered very mild, the fishing vessels went into harbor at least, three times a month. This was due to the S. W. and N. E. winds, which, combined with the strong tides and comparatively shallow water, would soon raise a "nasty sea." These blows, though perhaps not extremely dangerous, would frequently occasion loss if an attempt was made to ride them out, either by the breaking of some part of the rigging, or, if the deck was filled with fish when the wind came, by the loss of a part or all of these.

Nor are winds and waves the only things causing the vessels to seek the harbor. It is frequently very convenient to leave some things on shore, so as to have more room in the vessel. Thus the Bunker Hill left barrels of pickled *fnns* on shore, and Captain Lawson left there, until ready to return home, quite a cargo of codfish he had brought from the Grand Banks, but which was in his way while fishing. New supplies of water must also be secured. The harbor of Hólsteinborg usually is open by the middle of May, and perhaps fishing could be commenced by the first of June, but the ice that is brought down the east coast of Greenland, besides blocking up the more southern harbors, will probably render the passage north too dangerous before the middle of June. On this account, and because the change in the weather about the 20th of August, the fishing here will have to be done in July and August.

C.—FISHING.

7.—TIME OF YEAR FOR FISHING.

The time for fishing in these waters is July and August. There is no doubt but that the fish will bite both earlier and later than this, but these are the best months, and August is better than July. Besides abundance of fish, other considerations, such as climate and the passage to the strait and home again, tend to limit the time to these months. The fish caught in August were in much better condition, and had a much larger proportion of females than those caught in July. This may, however, have been due to the fact that the fishing was done on an entirely dif-

ferent part of the bank in August than the preceding month, and also to a difference in the food of the fish.

8.—APPARATUS AND METHODS.

The fishing is done by means of trawls. A trawl is composed of several parts. First, there is the "ground line," which is anchored at each end, and lies on the bottom. The hooks are attached to lines 5 feet long, called gangings, which are in turn fastened to the ground line at every 2 fathoms, sometimes at every 2½. To mark the position of each end of the trawl, a line extends from the anchor at the end of the ground line to a buoy on the surface of the water.

The main or ground line is about a quarter of an inch in diameter, and is made up of parts, 50 fathoms long. Each of these parts has one end fastened, so that it will not unravel, while the other has a loop spliced in it. The end not spliced is tied by a knot, that is both strong and secure, but still easily untied, to the loop end of the next part. The trawls can thus, by using more or less of these 50-fathom pieces, be made of any desired length, but, when not in use, six of these parts are usually kept fastened together, and are then called a tub or skate of trawl, according to the manner of keeping them. In fishing for cod and haddock, and formerly in the halibut fishery also, they were kept coiled up in tubs; whence the name "tub of trawl," meaning 300 fathoms of trawl. But now, in the latter industry, they are kept in what are called skates.

A skate is a piece of canvas about a foot and a half square, having two pieces of rope, 6 feet or so in length, so fastened across it that an end projects from each corner. Upon this canvas the 300 fathoms of trawl are coiled and firmly secured by the ropes, tied together above.

The phrases "tub of trawl" and "skate of trawl" are often synonymous. Thus on the Bunker Hill, though no tubs were used to keep the trawls in, it was quite common to hear the fishermen speak of setting two or more "tubs of trawl."

The buoys used on this trip were of two kinds: the "boat buoys" and "keg buoys." The boat buoys were blocks of wood, three feet long, cut in the shape of a round-bottomed row-boat, and coated with tar. The buoy line is attached by means of a swivel to the under part of the buoy, just in front of the middle. Back of the middle is bored a hole from top to bottom, through which passes the flag-pole. This pole fits in loosely so that it turns freely and can be taken out for easy packing in the dory. In order that it may not slip too far through the hole, a piece of leather is nailed round the pole above the hole, and, to keep it upright, a weight is attached to its lower end. The flag is a small canvas painted black. These buoys are not, however, so serviceable as the keg buoys, which are small water-tight kegs, holding a little over a quarter of a barrel. Through the keg runs the flag-pole, tightly wedged in to prevent leakage and strongly fastened by stout lines to prevent

its coming out. To this is fastened the flag above, and the buoy line below. The great advantage of these last over the other kind of buoy is their greater buoyancy; for the boat buoys were continually being carried under by the force of the tide, so much so that it was frequently necessary to use two of them in place of one. On the other hand, the keg buoys were liable to burst, an accident rendering them fit only for the fire. Unfortunately only ten keg buoys were brought on this trip; not enough for each dory to have one at each end of its trawl. The matter was settled by using one of these for the outer end of the trawl, while one or two of the boat buoys were used at the inner end.

The typical manner of setting a trawl is in a straight line, across the direction of the tide; for if the fish swim, either with or against the current, a greater number will cross the ground line lying in this direction than in any other. Two men are necessary for the operation. One man sits in the bow of the boat, rowing slowly in the required direction, while the other, in the stern, sets the trawl, by first throwing out the inner buoy, with its attached buoy line, to be followed by the inner anchor. This, in turn, is succeeded by the ground line, outside anchor, buoy line, and keg buoy. The length of a trawl varies, according to circumstances, from one to four skates, *i. e.*, from 300 to 1,200 fathoms.

As already stated, two men in a dory were necessary for setting a trawl, and, as there were six dories, three for each side of the vessel, twelve of the crew were required for the fishing, while the captain and cook made the whole number fourteen. Each dory had by lot a particular position assigned to it, and according to this was its relative place of setting the trawl. The vessel at anchor would naturally have her bow toward the tide, and thus the middle dory, on each side, by setting in a line perpendicular to the length of the vessel, would set exactly across the tide, the most favorable direction. In order not to be too close together, the dories in front of the middle ones would set in lines running a little forward, while the stern dories would set in lines running a little backward. This, the typical manner of setting, is varied, of course, by many circumstances, as winds, tides, position of vessel, or the narrow spots to which the fish may be confined.

Before speaking of the hauling of the trawls, it will be best to consider the arrangements about the dories and the baiting. Before starting, the crew, according as the disposition of the men inclined them, had become divided up into pairs for dory mates, but not until we were well on our way were lots drawn to decide upon their respective dories. Previous to the drawing of these lots, the dories, which were entirely without internal arrangements, such as seats, &c., were kept amidships, three on each side of the vessel, firmly lashed, upside down, one within the other, to the deck. The dories were numbered from one to six, and six slips of paper were prepared, each having one of these numbers on it. These, being thrown into a hat, were drawn by one from each pair of dory mates, each having the dory with the number corresponding to the one on his slip. Boards

had been brought for making seats, and, as might have been expected, different degrees of proficiency were displayed by the men in working them up. The men in each dory are expected to do everything pertaining to their own boat, such as taking care of dory, baiting, setting, hauling and keeping the trawls in good condition.

Two barrels of pickled menhaden were taken to use for the first baiting, or until enough fresh bait had been caught for this purpose. Afterward the cod and smaller halibut were employed, and, when these were not enough, the napes of the larger halibut were used. The bait is cut up into strips about six inches long and an inch square at the end. The cutting of this is done mainly on the roof of the cabin, by large heavy knives. Thick planks had been nailed on top of the cabin for this purpose, and the men of each dory had their places for chopping (for the cutting is more of a chopping than anything else) chosen by lot. There not being room on the cabin for all the men, those of the forward dories used boards laid across the large flitching tubs, for cutting their bait.

After enough bait is cut, the skate of trawl is placed on the cabin, and, being untied, the skate is taken away from the coil and spread out on the deck below. The fisherman then commences at the top of the trawl and, baiting the hooks as he proceeds, recoils it again on the skate below. The baited hooks are thrown into the center of the coil. Both the chopping of bait and the baiting are lively times, and wonderful stories are told about the speed with which some fishermen can perform these operations. There is however, a limit to the speed with which these can be done well, and those who boast most of their quickness are, ten to one, not the best fishermen.

The skates, baited and tied up, are ready for the water, and, if the set is to be made immediately, they are placed in the stern of the dories. When the weather is favorable, it takes about fifty minutes to set four skates to a dory, but, when either tide or wind is strong, more time is necessary. Two to four hours are allowed from the time of setting to the time of hauling.

This last is usually commenced from the outer end, so that the men may work toward the vessel and have less distance to row should they be so fortunate, as to secure a load of fish. When the buoy is reached, the oars are taken in and laid one side, where they will be the least in the way; a roller, whose wheel is four to six inches in diameter, with two or three grooves on its rim, is fastened to the side of the dory near the bow; the buoy is taken in, unfastened from the line, and placed in the stern of the boat, and the hauling commences. The roller is almost indispensable. The line is hauled over this by the man in the bow, who does the hauling, and is then passed on to the man in the stern, to be by him coiled up and put with the buoy in the stern. (The stern is separated from the rest of the boat by a cross-partition of boards.)

After the buoy line and anchor have been taken into the boat, comes the fishy part of the haul. The hooks, whether with or without fish, are

not hauled into the dory by the man in the bow, but are kept over the side until they, as they are carried along by the ground line, reach the other end of the boat, and are there freed either of poor bait or of fish. The bait is easily shaken off by striking the hook against the gunwale of the boat, but the fish are not as easily managed. The large size of the fish necessitates the use of something besides the fishing hooks for pulling them into the dory. Accordingly, large iron barbless hooks, with a loop on the end away from the hook for the hand to grasp, are used for this purpose.

But the fish must also be killed or stunned before taken into the boat, or otherwise considerable inconvenience, to say nothing of danger, might be occasioned by their lively flapping. For this reason killers are used. The "killer," which is also employed for unhooking the fish, is a hardwood club, about 2½ feet long. The larger or striking end is round, while the other, or handle part, is flattened a little and has a notched end.

When the fish comes to the stern of the dory, the fisherman hooks him in the eye, or some firm part of the head, with the large iron hook, and, after stunning him by hitting him several heavy blows over the snout with the killer, hauls him into the boat. Frequently the fish has swallowed the hook, and its extraction, were it not for the killer, would be a problem involving much cutting and loss of time. The flattened and notched end of this instrument is run down the gullet of the fish and, after the line is secured to the other end so as to prevent slipping, the club is turned until, by the coiling of the line, the hollow of the hook fits into the notched end. Then, by a sudden push downward and a jerk upward, the hook is loosened and hauled out.

The work continues on in this manner, the man in the bow doing the hauling, while his mate attends to the coiling of the line, shaking off old bait, and taking the fish into the boat, until either the boat is full, or else all the trawl is hauled. In the latter case a return is made to the vessel. Should, however, the boat be filled before the hauling is completed, and any of the fishermen be through with the hauling of their trawls, an oar is raised as a signal for a dory to come and take the fish already caught, that the hauling may be interrupted as little as possible. If, on the other hand, all of the fishermen are busy when the boat-load is secured, the ground line is buoyed at the end of one of the 50-fathom pieces, while the load is carried to the vessel. Relieved of their load, the men return to the buoy they have just left and continue the hauling.

Sometimes the trawl is caught in the rocks, so that it is necessary to break it and commence at the inside buoy for the hauling of the remainder. Should it be caught and broken the second time, there is great danger of losing the part that is still in the water, unless it can be caught by the grapple. The grapple is a chain with an iron bar at one end and having, at several places along its length, circles of iron points, three or four inches long, directed away from the end to which the bar is attached. It is used in the following manner: Three men go in the

dory, two to row and one to attend to the grapple. This, fastened to a line by the end toward which the iron points are directed, is let down until the iron bar drags upon the bottom, but not so low as to permit the whole chain to drag. The men row back and forth over the spot where they think the trawl is, and, if they are right in their calculations, it is hard to see how they can fail to grapple it.

The fish are taken from the dories by the large iron hooks, already mentioned as being used in the small boats. When a load of fish is brought to the side of the vessel, one of the fishermen holds the stern and another the bow painter, while the man in the stern hooks the fish and hands them up to his dory mate, standing on deck ready to haul them on board.

The last set was made August 27, and was done while the vessel was under sail. Comparatively little fishing had been done since the 20th, for the wind had prevented the setting of the trawls, though the hand line showed that the fish had not departed. The captain accordingly decided to run into harbor and prepare for going home, but, finding the wind near the shore rather gentle and the water smooth, thought best to see how the fish would bite near the mouth of the harbor. As this was the first time we had set under sail, I was curious to see how it was managed.

The dories set in turns. First one is towed astern, while the outside buoy and buoy line are being thrown overboard, then it is set adrift and the rest of the trawl set at right angles to the direction the vessel is sailing. The rest of the dories go through with the same operation in succession, by which time the first dory has finished setting and is taken in tow by the vessel. Some of the dories are left fastened to the buoy line to mark the place of the trawls while the vessel sails back and forth an hour or two, until the time of hauling comes. The hauling is done in the usual manner. This manner of setting is used quite frequently on the banks of Newfoundland to find out whether the fish are abundant. If the fish are found in considerable numbers, the anchor is dropped, and the trawls run out again in the regular way. Only eighteen fish were caught this haul, so we turned the bow towards the harbor.

9.—DRESSING AND SALTING.

After all the trawls have been hauled, the men usually attend to the dressing of the fish. For this operation, the men had prepared four legless tables, about 6 feet long and 3 feet wide, which, in use, were inclined against the side of the vessel in such a manner that one end rested upon the gunwale while the other remained on deck. Two men worked at a table, one on each side.

The knives employed were of different shapes and sizes, but the one seemingly the most in favor has the blade about 8 inches long, an inch and a half wide, and not so thick but that it had a good spring to it. All were sharp pointed and most of them of good material.

Iron hooks similar to, but smaller than, those used for taking the fish out of the dories into the vessel, are used for fastening the fish upon the table. To the loop end of the hook a short rope, having a cross-piece of wood, is fastened. The fish is hooked in the small of the tail, and, being drawn up on the inclined table, is secured there, head downwards, by placing the rope in a notch cut in the top edge of the table, the cross-piece of wood preventing its slipping back.

It will be remembered that the halibut is shaped somewhat like our common flounder, or flat fish. The backbone, with its spines lying in the same plane with the body, leaves, on each side, a thick layer of boneless flesh. These layers, called *fitches*, are what the men are after. After the flaps of the dorsal and ventral fins have been cut off close to the body, a cut, deep enough to reach the plane of the backbone and extending from the head to the tail, is made, about 2 inches from and parallel to the dorsal line of the body, followed by a similar cut from the gills to the tail, but on the ventral edge of the body. These two are then connected at the head by a cut parallel to a gill plate and at the tail end by a straight cross-cut. For the better handling of the fitch, a slit, large enough to admit the hand, is made at each end. The fitch is then grasped at the posterior part with one hand, and, as it is raised by this hand, is cut free from the backbone with the other. The fish is then turned over and the other fitch taken off in the same manner.

The cuts made parallel to the dorsal and ventral edges of the body, being 2 inches or more from these, leave strips of flesh and fat attached to the inner bones of the fins, which, when pickled, bring a good price under the name of halibut fins. Accordingly, after the fitches, these strips are cut off and pickled. The rest of the fish, consisting of the bones, head, and viscera, is then thrown overboard and another one is placed on the table.

After the fitches are cut from the fish, they are thrown into large tubs called *fitching-tubs*, to be there rinsed free from blood and dirt, previous to being salted in the hold. It is one man's duty to attend to the washing of the fitches and to the passing them below, while three men are salting. The hold is divided up by plank partitions into six large bins, three on a side, in some of which the salt is kept until used by the salting of the fish in the others. One man carefully places the fitches in layers, one above the other; a second man, with a scoop like the grocers use for flour and sugar, covers them with the salt, while a third shovels the salt within reach of the second. The Bunker Hill left Gloucester with 270 hogsheads of salt, and out of this salted 9,000 fish, amounting to 140,000 pounds of fitches, having used a little over nine-tenths of the whole quantity. This salt came from Cadiz, Spain, and cost \$1.50 per hogshead, or \$405 for the whole.

10.—TABULAR VIEW OF SUMMER WORK.

The following tables represent in a concise form the times of setting and hauling of the trawls, the number of fish caught at each haul, together

with the depth of water, tides, weather, &c., while the trawls were in the water. I have taken the time when the men left the vessel for setting and hauling to represent the time of these operations. To set four skates of trawl usually took a little less than one hour, while for hauling the same, especially if there were many fish, required three, and often four hours.

Since the outer end of the trawl was set last and hauled first, this would remain in the water less time than that represented by the tables, while the inner end, set first but hauled last, would be in the water much longer. Yet, as a rule, more fish were caught on the outer than on the inner end. Many things are unfavorable for the trawls remaining long in the water. In the first place, if the fish are present they will soon hook themselves, and more time than is necessary for this is, of course, wasted. Then, again, the tide, fish, or both combined, are apt to entangle the trawls in the rocks, if these are left too long in the water. Besides, the voracity of the little shrimp would soon leave nothing but the bones of the halibut for the disappointed fishermen, were they allowed many hours to satisfy their appetites. So plentiful are these little creatures in some places that they could be scraped off the fish by the handfuls, and, when the trawls had remained in the water two or three hours, they had left the branchiostegals hanging loosely, besides making a general assault on the whole body.

There were three days of fishing before the 5th of July (the date first mentioned in the table) of which I have no minute notes, and have therefore omitted mentioning them in the table. The fish caught during these days, together with those caught on the hand-line from the side of the vessel, would certainly make the whole number taken during the trip over nine thousand. Sixty-six hauls are recorded in the table, by which 8,616 fish were taken, averaging 139 for each haul. The smallest number taken at a single set was four, the depth being 27 fathoms, and the largest number was 497, the depth being between 25 to 30 fathoms. The depths expressed, owing to the irregularities of the banks and the extent of surface covered by the trawls, are, of course, only approximate, but whenever this was measured, I have used the depth where the vessel was anchored in preference to the rough calculations of the fishermen, for I have found them, in this respect, a little inclined to overestimate. It will be observed that the depth in August was less than in July.

Table for July and August, representing the times of setting and hauling trawls, fish taken, depth of water and remarks on weather, tides, &c.

Date.	Set.	Hauled.	Fish.	Depth.	Remarks.
July 5	2.20 p. m...	4.05 p. m...	48	40	Wind S.W. Cloudy, with slight mist. Tide slackening from running N. Shifted position.
5	8.15 p. m...	11.40 p. m...	96	40	Wind W.N.W. and increasing. Cloudy.
6	2.50 p. m...	5.25 p. m...	144	40	Wind N.E. Hazy. Tide slackening from running N.
6	7.45 p. m...	10.05 p. m...	24	40	
7	3.15 p. m...	0.55 p. m...	90	40	Wind S.W. and nearly calm toward the end. Partly cloudy. Tide slackening. Shifted position.

Table for July and August, representing the times of setting and hauling trawls, &c.—Cont'd.

Date.	Set.	Hauled.	Fish.	Depth.	Remarks.
July 8	4.05 p. m...	6.45 p. m...	56	<i>Fath.</i> 50	Wind N.E. Rain. Tide slackening from running N. Fish small. Shifted position.
9	3.45 p. m...	6.30 p. m...	352	50	Calm at first, wind rising from E.S.E. Cloudy. Tide quite strong, but slackening from running N.N.E.
10	5.50 p. m...	8.45 p. m...	95	50	Wind W.S.W. Raining. Tide slackening from running N. Shifted position.
11	7.30 a. m...	10.20 a. m...	66	(?)	Calm. Sky clear. Tide slack.
11	2.50 p. m...	6 p. m...	48	(?)	Calm. Sky clear. Tide running slight toward the S.S.W. Shifted position.
12	6 a. m.....	10 a. m.....	158	50-60	Calm. Sky clear. Tide not strong; running N.
12	3.45 p. m...	6.30 p. m...	282	50-60	Wind slight, S.W. Sky clear. Tide slackening.
13	8.30 a. m...	11.45 a. m...	157	50-60	Wind slight, W.N.W. Sky clear. Tide running W.
14	6.40 a. m...	(?)	12	50-60	
14	4 p. m.....	7 p. m.....	37	(?)	Wind gentle, N.E. Foggy.
15	1.20 p. m...	4.15 p. m...	93	55-60	Wind N.E. Foggy.
15	7.55 p. m...	1 a. m.....	65	55-60	Wind N.E. and E.N.E. Foggy.
16	2.30 p. m...	6 p. m.....	14	55-60	Wind N.E. Sky clear. Shifted position.
18	11.35 a. m...	2.10 p. m...	4	27	Wind S.W. Clearing from fog. Tide quite strong. Shifted position. Three skates to a dory.
19	12.55 p. m...	2.15 p. m...	54	40	Wind S.W. Cloudy. After hauling ran into Holsteinborg Harbor.
23	7.15 a. m...	10.45 a. m...	148	35-40	Calm. Cloudy. Tide running strong toward N. Two skates to a dory.
23	2.50 p. m...	5.40 p. m...	380	35-40	Calm. Cloudy. Tide slackening from running N. Four skates to a dory.
24	8.30 a. m...	12.25 p. m...	328	35-40	Calm. Cloudy. Tide running strong to the N.E. Four skates to a dory.
24	4.15 p. m...	9 p. m.....	127	35-40	Calm. Cloudy. Threatening fog from the W. Tide strong toward the W. Two skates.
25	6 a. m.....	9.20 a. m...	305	35-40	Calm. Cloudy. Tide moderate at setting, strong at hauling. Four skates to a dory.
25	4.05 p. m...	7.45 p. m...	257	35-40	Wind gentle, N.E. and N. Cloudy. Tide strong. Four skates to a dory.
26	6.45 a. m...	10.45 a. m...	102	35-40	Wind gentle, N. Misting. Tide running strong to N.E. Shifted position.
27	6 a. m.....	9.30 a. m...	24	55-60	Calm. Cloudy. Tide running northward. Four skates to a dory. On edge of bank.
27	12.45 p. m...	3.40 p. m...	25	65-60	Calm. Cloudy and misting. Tide slackening. Two skates to a dory. On edge of bank. Shifted position.
28	5.30 a. m...	8.40 a. m...	7	(?)	Wind slight, N.E. Low fog; clear above. Tide moderate. Two skates to a dory. Shifted position.
31	5.10 a. m...	8 a. m.....	76	40-45	Wind moderate, S.W. Cloudy, with rain. Tide strong, running N.E. Two skates to a dory.
Aug. 1	Noon	2.30 p. m...	138	40	Two skates to a dory.
1	5.30 p. m...	7.15 p. m...	61	40	Two skates to a dory.
2	5.15 a. m...	7.15 a. m...	39	40	Wind S.W. Raining. Tide strong. Two skates to a dory. Shifted position.
2	1.15 p. m...	4.15 p. m...	113	40	Wind slight, S.W. Raining. Tide slackening. Two skates to a dory.
2	5.45 p. m...	8.45 p. m...	48	40	Wind slight, S.W. Raining. Tide commencing to run. Two skates to a dory. Shifted position.
3	1.45 p. m...	4.45 p. m...	305	40	Wind moderating, W. Cloudy. Tide strong, but slackening. Four skates to a dory.
4	1.15 p. m...	4.30 p. m...	289	40	Calm. Sky clear. Tide slackening, running E. Four skates to a dory.
4	7.15 p. m...	11 p. m.....	18	40	Shifted position.
5	2.30 p. m...	6 p. m.....	274	35	Wind gentle, N. Clear, with few clouds. Tide slackening. Four skates to a dory.
6	3 a. m.....	5.45 a. m...	84	35	Wind very slight, E. Sky clear. Tide nearly slack when hauled. Two skates to a dory.
6	3.20 p. m...	(?)	172	(?)	Calm. Cloudy. Tide slackening. Four skates to a dory.
7	7.15 a. m...	10 a. m.....	251	25-30	Calm. Cloudy. Tide commencing to run strong. Two skates to a dory.
7	2.15 p. m...	6 p. m.....	407	25-30	Calm. Nearly clear. Tide slackening. Four skates to a dory.
8	2.15 p. m...	5 p. m.....	407	25-30	Calm. Cloudy.
9	2.40 p. m...	5.30 p. m...	420	25-30	Wind slight from the W. Hazy, followed by fog.
10	3 p. m.....	(?)	234	25-30	Wind moderate, W.S.W. Cloudy. Tide slackening. Four skates to a dory.
11	4.15 a. m...	7 a. m.....	61	25-30	Wind moderate, S.W. Two skates to a dory.
11	1.10 p. m...	5 p. m.....	53	25-30	Wind W., moderating. Cloudy. Shifted position.

Table for July and August, representing the times of setting and hauling trawls, &c.—Cont'd.

Date.	Set.	Hauled.	Fish.	Depth.	Remarks.
Aug. 12	4.50 p. m.	7.30 p. m.	254	<i>Fath.</i> 35	Wind gentle, E.N.E. Clear. Tide slack. Two skates to a dory.
15	4 a. m.	0.46 a. m.	60	35	Wind N.W., freshening. Cloudy. One skate to a dory.
16	4.45 a. m.	7 p. m.	63	35	Calm. Clearing, followed by blue sky. Two skates to a dory.
16	6.30 a. m.	8.10 a. m.	102	35	Wind gentle, N.E. Sky clear. Tide strong, running to windward. Two skates to a dory. Shifted position.
16	2.30 p. m.	4.45 p. m.	112	80	Wind gentle, N.E. Hazy. Tide moderate, running to the east. One skate to a dory. Fish large.
16	6 p. m.	8.30 p. m.	111	80	Wind moderate, N.E. Clear. Tide running to windward. Two skates to a dory.
17	6 p. m.	8.10 p. m.	112	30	Wind moderate, N.E. Cloudy. Tide slack. Three skates to a dory. Shifted position.
18	7.10 a. m.	Noon	200	30	Wind light, E.N.E., becoming calm. Cloudy. Tide strong. Three skates to a dory. Fish excellent. Holsteinborg.
20	4.85 a. m.	7.45 p. m.	68	25	Wind gentle, N.E. by E. Clear. Tide running strong, S.S.W. Three skates to a dory.
21	5.30 a. m.	10 a. m.	74	25	Wind moderate, N.E. Clear, followed by fog. Tide strong to windward. Three skates to a dory.
21	4.30 p. m.	7.30 p. m.	81	25	Wind moderate, N.E. Foggy. Tide slackening. Shifted position.
24	11 a. m.	2.40 p. m.	123	30	Wind moderating, N.E. Clouds broken. Tide running to windward. Shifted position.
27	7.15 a. m.	(f)	18	.....	Set under sail on the inner ground, near the mouth of Holsteinborg Harbor.
	Total . . . . .	.....	8,616		

Average time between setting and hauling in July, 3 hours.

Average time between setting and hauling in August, 2 hours, 53 minutes.

Average depth of water in July, 45.5 fathoms.

Average depth of water in August, 33 fathoms.

Number of fish caught in July	3,764 +
Number of fish caught in August	4,852
Total	8,616 +

11.—NATURAL HISTORY OF THE HALIBUT SO FAR AS IT AFFECTS THE FISHING.

In the preceding tables, under the head of "remarks," quite frequently occurs the phrase "Shifted position," which signifies, in this connection, a little more than mere changing of the position of the vessel; it implies that the fish, for some reason, are no longer to be caught where they may have been, up to that time, quite abundant. Are the fish of a roving disposition, or do the individuals remain within restricted limits? I shall not attempt to decide, but will merely mention some facts which may have a bearing on the question.

The fishermen seldom expect to catch many fish near the vessel after the first flitching. If you ask for an explanation of this, they will tell you that the "gurry" drives the halibut away. By "gurry," they mean the refuse of the fish, that is thrown overboard at the time of flitching. There is only a single case, that I know of, which would seem opposed to this explanation. It is that of a large halibut which had eaten the head, backbone, and viscera of a fish that had been flitched. It cannot be that the flesh of their own species is distasteful to the halibut, for this is what the

fishermen use for bait, nor can it be that they mistake the white gleam of the flesh for sharks, for the sharks caught here were of a very dark color. Whether we know the cause or not, it is none the less true that the fish cease to bite near the vessel, after the first flitching, whereas, if this operation is delayed, or the tide, at the time of it, is strong enough to carry the "gurry" away a considerable distance, the fish continue to bite freely. Considering, then, that the "gurry" has this effect, what is the result of remaining in one spot several days? Evidently the mass of "gurry" will increase, and, being drifted by the tides, will cause the vessel to be the center of an ever-increasing spot, where the halibut will not bite. It is thus necessary, either to set the trawls at a greater distance from the vessel, or else to move this to a new spot. The latter method, of course, is the easier.

On the 23d, 24th, and 25th of July, over 1,500 fish were taken from a limited spot, at some distance from the vessel, where the gurry did not reach, because the tide ran in the opposite direction, but there appeared little if any decrease in the numbers. The spot could be easily distinguished from the rest of the bottom, by the absence of the tree-like stems of Hydrozoa. On the 26th, only two of the dories succeeded in setting on this spot, and these two got fish while the others failed. The attempt to bring the vessel nearer failed so utterly that the trawls did not touch the spot again; 1,700 fish had been caught in four days, on a spot not a mile square. I am inclined to think that as fast as some were caught their places were filled by new arrivals, and were it not for the gurry, a vessel once anchored in a favorable position would not have to move until a load had been secured.

But, it will be asked, will this gurry permanently injure the fishing? Probably not. There are many carnivorous animals, besides the little shrimp already spoken of, which would soon eat up everything except the bones of the fish, and it is hard to see what harm these can do. Nevertheless, there does seem to be some effect produced by the fishing of one year upon the abundance of the fish in the same place the succeeding years; for the fishermen complain that the halibut off the coasts of New England, Nova Scotia, and New Foundland must be sought in deeper and deeper water year after year. If this be so, it is hard of explanation. For if we consider the halibut as of a roving disposition, why should they shun their former haunts because they have been fished on, or if, on the other hand, they are not rovers, how can they, considering this great fecundity, be so easily exterminated, as their disappearance from these haunts would imply?

This fecundity must be very great. In a fish about six feet in length I calculated the ovary had 2,782,425 eggs. This was done by counting how many eggs there were in a straight row an inch long and from this finding how many there were in a cubic inch. The number of cubic inches in one of the boxes in which the codfish hooks came was calculated and the box filled with eggs. These eggs were then weighed.

The whole mass of eggs was next put on the scales and their weight divided by the weight of one cubic inch, to ascertain the number of cubic inches of eggs. This result, multiplied by the number of eggs in one cubic inch, would give the number of eggs in the whole ovary. Considering that the number given is some too large, I cannot conceive how any error so great, as to make the number less than two millions, could have crept in. I do not know whether all these eggs would have been laid at one time, or not, but, as they appeared to be nearly of the same size, I judge that such would probably have been the case.

There was no way of determining accurately at what stage of the tide the fish were the most voracious, but they appeared to take the bait best the latter part of the stronger tide, for it was then that the hand-line was most successful, and the men expected the best luck with the trawls.

Though the fish are of the same species as those caught on the Grand Banks, nothing was found in them, in the shape of hooks or food, indicative of a migration from any other place.

August 5 I made several observations upon the temperature of the rectum of the halibut, when they were first taken by the hand-line, and found, with one exception, the temperature to be 39° Fahr. These observations were made within an hour or two of the time the temperature of the bottom was taken. The exception referred to was where one halibut showed a temperature of 39½° Fahr., half a degree higher than the others.

The food of the fish was different for different places and times. Where we first fished it was composed of crabs and other crustacea, with now and then a fish of the genus *Cyclopterus*. But, when we shifted to a spot twenty miles or so south of this, we found some of the species of crustacea had disappeared, and the principal source of food was a small fish called "lant." There was also a great difference in the condition of the fish in these two places; those of the last place being far better and more vigorous. The males were above 6 to 1 female in the first place, whereas the females in the latter place predominated greatly over the males. I take the following from my diary of August 8 to show the difference in the two places:

"The fish on this bank have none of the large shrimp in their stomachs that were found in the stomachs of the halibut on the other bank. Here they have mostly lant, there mostly shrimp. None of the common cod have as yet been caught." A few were caught after this. "Sharks and cat-fish are likewise very few. There are no walruses or seals, few whales, and many birds. The birds are not as hungry as on the other bank, and it is harder to shoot them, for they do not fly very near."

N. W. mag. from Holsteinborg, July.

Food, principally crustacea.

6 males to 1 female.

Fish poor.

Fish in spots.

W. S. W. mag. from Holsteinborg, Aug.

Food, principally lant.

1 male to 7 females.

Fish fat and vigorous.

Fish more evenly distributed.

The halibut do not always swim near the bottom. I saw one leap out of the water where the depth was 40 fathoms, and have caught them on the hand-line when this was only half-way down. Several have followed the bait to the surface, and one even followed the thermometer up twice in succession. Feathers were pulled out of the mouth of one, and the skeleton of a gull, *Larus tridactylus*, was found in the stomach of another.

D.—FISHERMEN.

In the preceding pages I have considered the halibut from a fisherman's standpoint, and have attempted to give a clear idea of the methods of capture, and will, in the rest of this report, pay particular attention to the fishermen themselves.

12.—GENERAL CHARACTER OF VESSEL, CREW, AND FINANCIAL ARRANGEMENT.

The Bunker Hill is a two-masted schooner, of 100 tons burden. This is large for a fishing vessel, as the majority of the Gloucester vessels are less than 75 tons burden, and I believe there are only a few fishing vessels in that place as large as the Bunker Hill. The crew, including the captain and cook, consisted of fourteen men, and was considered one of the best that ever sailed from Gloucester. They certainly were well acquainted with their business, and, as for disposition, there was no sign of a quarrel during the whole summer. This last is especially remarkable, because of the absence on board of the fishing vessels of the traditionally severe ship discipline. The captain, unless the cook can be so called, was the only officer on board. The cabin was open alike to all, and as the bunks, with the exception of the captain's and my own, were chosen by lot, each one of the crew, providing he was sober when the lots were drawn, had as good a chance as his neighbor of securing sleeping quarters there.

The explanation of this general freedom is probably to be found in the co-operative nature of the trip, the financial plan of which was about as follows: The owners of the vessel were to receive 46 per cent. of the net stock and furnished, besides the vessel, food, salt, and fishing tackle, while 50 per cent. of the net stock, after deducting the cost of tarring the rigging, refilling medicine chest, pilotage, etc., was to be divided into fourteen equal parts, according to the number of the crew, one part going to each. The captain was to receive, besides one of the fourteen parts, the remaining 4 per cent.* The arrangement was thus, in some sense, a partnership, the owners furnishing the capital and the fishermen the labor, the profits to be shared in certain proportions. This general arrangement is not universal; for on some fishing vessels the men are paid a stipulated sum for the trip, the owners running the risk

* The captain's share is usually four cent. of the net stock, but it may vary either one way or the other.

of profit or loss, while on others the crews are composed of both hired men and shares-men.

13.—EVERY-DAY LIFE, SUPERSTITIONS, ETC.

At a quarter past six, Monday evening, the 9th of June, the steam-tug, Sarah E. Wetherell, pulled the Bunker Hill off from the wharf, so that her sails might catch the wind favorably. We had expected to start several hours earlier, but the little unexpected delays common to such occasions had prevented. Even as it was, on counting up hands, two were found missing; so that, while we tacked back and forth at the mouth of the harbor, waiting, a dory was sent to find the delinquents. Two hours passed before the return of the dory, and our number was complete; but during this time the wind had died out, rendering it doubtful whether we would succeed in leaving the harbor that evening. Nine o'clock, however, saw us outside of the harbor, headed in the direction of Nova Scotia.

A general feeling of excitement, prevailed, strengthened in part by indulgence in the strong stuff; but as only a quart of the fiend was brought on board, outside of the crew and the Fish Commission tanks, all were soon sober and ready for work.

The captain had his berth, and one had been assigned to me, but the rest of the crew had as yet no settled sleeping place. The bunks to be chosen were in the cabin and forecastle. The cabin had two double-berths on each side, but as the starboard (right hand) ones were reserved for the captain and myself, only two of the berths were vacant. As the berths were large there was room in the two larboard (left hand) ones for four, making six to sleep in the cabin. The forecastle was arranged with berths on each side, and a table in the center, in front of the foremast, where we took our meals. One of the men was too much overcome, by something he had taken, to choose his sleeping-quarters at the same time the rest did, and naturally the worst bunk in the vessel fell to him. This was more, or rather less, than he could endure; so he took up his quarters back of the cabin, under the wheel, and, with the exception of the dampness of the place, had quite a comfortable bunk. This added one more to the occupants of the cabin, leaving eight to sleep in the forecastle. Each man furnished his own bed and bedding.

This evening we had our first meal on board. The crew took their meals in two sets, the first of seven, and the second of eight, and this division was made in such a manner as the least to interfere with the fishing arrangements. As already seen, the dorymates had to attend to the fishing arrangements of their own dory. Now, many of these things, such as renewing hooks, baiting, &c., could be attended to by one man at a time, and less time would be lost if only one went to meals while the other kept on working, than if both went together. On this account, the division of the men at meals was made, with one exception, caused by my presence, in such a manner that only one man to a dory would

eat at a time. As for the captain and cook, who were exempted from fishing, the captain ate with the first set, while the cook waited until the second.

Another important matter attended to this evening was the setting of the watches. On leaving the wharf at Gloucester, the captain had taken the helm and kept it until we were well out of the harbor and on our course, when the watches were divided. Two men stand on watch at a time. Each watch is two hours long, and each man is at the wheel half of this time and forward the other half. The captain and cook, having no watching to do, this falls upon the other twelve of the crew, who each have, out of the twenty-four, four hours of watching, two of which are spent at the wheel. In order to prevent each man's watch coming the same hour each succeeding day, one man, each day, omits his watch. and by this means all the watches are pushed backward every twenty-four hours. The man who omits his watch is the one who, otherwise, would have his wheel between six and seven in the evening.

12-1 p. m.	{ <i>a</i>	{ <i>b</i>	{ <i>c</i>
1-2 p. m.	{ <i>b</i>	{ <i>c</i>	{ <i>d</i>
2-3 p. m.	{ <i>c</i>	{ <i>d</i>	{ <i>e</i>
3-4 p. m.	{ <i>d</i>	{ <i>e</i>	{ <i>f</i>
4-5 p. m.	{ <i>e</i>	{ <i>f</i>	{ <i>g</i>
5-6 p. m.	{ <i>f</i>	{ <i>g</i>	{ <i>h</i>
6-7 p. m.	{ <i>h</i>	{ <i>i</i>	{ <i>j</i>
7-8 p. m.	{ <i>i</i>	{ <i>j</i>	{ <i>k</i>
8-9 p. m.	{ <i>j</i>	{ <i>k</i>	{ <i>l</i>
9-10 p. m.	{ <i>k</i>	{ <i>l</i>	{ <i>a</i>
10-11 p. m.	{ <i>l</i>	{ <i>a</i>	{ <i>b</i>
11-12 p. m.	{ <i>a</i>	{ <i>b</i>	{ <i>c</i>

Thus, for instance, in the table just given, if *f*'s wheel was between 5 and 6 p. m., *g*'s wheel would naturally come between 6 and 7, but *g* omits his watch and *h*, taking his place, has the wheel an hour earlier than the preceding day. The next day *g* has the wheel, between 5 and 6, and *h* omitting, *i* takes the wheel from 6 to 7.

The watches were arranged so that dorymates watched together every other day. Thus in the table, suppose that *e* and *f* are dorymates. The first day *e* and *f* watch together, the second day *f* and *g*, while the third day *e* and *f* are together again. Each watch called the next watch. The order of the watches was decided in the following manner: A hat was held crown down, one man from each dory putting a finger upon the border of the opening, while one of the others, commencing at random, counted the fingers in succession, until he reached the number nine. Finger number nine being withdrawn, the counting commenced again with one and continued to nine, which was also withdrawn. This continued until no fingers were in the hat. The owner of the first finger withdrawn, together with his dorymate, had the first watch, the owner of second finger withdrawn, with his dorymate, the second watch, and so on through the whole.

I have said that the watches were two hours long, and this was true while we were on the passage out and back, but not so the intervening time; for, while we were anchored in the strait no watch was kept, because there was little or no danger. When, however, we shifted position and were expecting to anchor in a very few hours, the time would be divided into twelve equal parts, each man taking one part at the wheel. Thus once or twice the wheels were only ten or fifteen minutes long.

The passage from Gloucester to Holsteinborg lasted twenty days and was along the coast of Nova Scotia through the Gut of Canso, northward in the Gulf of Saint Lawrence, within sight of the western coasts of Cape Breton and Newfoundland, and thence by means of the Strait of Belle Isle, into the Atlantic and Davis Strait. The pleasanter days were occupied by the crew in fixing the dories and fishing tackle. I am not able to give a minute account of the events on the way up, because prolonged seasickness prevented the taking of many notes, but will give some extracts from my diary that may throw light upon the work and character of the men.

Friday, June 20, '79.—"The crew act very much like bees. Yesterday, a warm, pleasant, sunny day, they were all activity; to-day, cold and rainy, they were in their bunks most of the time from breakfast until dinner, and during the rest of the time, with few exceptions, have done little or nothing."

Though this was true, it was not on account of any disposition to shirk work, but rather because of there being only enough to do to occupy them on pleasant days; for, after the fishing commenced, they showed themselves to be good steady workers.

The duties devolving upon them, while on the way north, were the sailing of the vessel, fixing the dories, and rigging the trawls. The first was of course attended to principally by the different watches, leaving much time for the others. The fixing of the dories did not take very much time, as it only consisted in making thole-pins, three seats, and two vertical partitions for each boat and winding the oars with oakum to prevent them from wearing out. The vertical partitions, like the seats, were movable and were used to divide the dory into three parts. Typically, the stern apartment held the trawls, the central one the fish, while the bow was reserved for the anchors, but whenever the fish were numerous they were put wherever room could be found for them.

The rigging of the trawls, however, kept the men busy much longer than fixing the dories. Four skates had to be rigged for each dory, and all of these were of new material, excepting a large part of the lines to which the hooks are fastened. These short lines, called gangings, had been for two years kept in bundles, with the hooks protected from moisture by a canvas or rubber covering. These must, of course, be examined, in order to test the strength of each ganging, and to free the hooks from rust. Besides this, most of the hooks had to be taken

from the line and refastened. This last operation is called "ganging the hooks."

The gangings finished, the ground-line next occupies the fisherman's attention. This being composed, as already stated, of fifty-fathom pieces requires, that each of these pieces should have a loop spliced in one end, while the other is fastened by what the sailors call a "wall," so that it will not untwist. The loops and walls finished and six of the fifty-fathom pieces tied together, the ground-line is ready for the attachment of the gangings, which are then fastened to it at every two fathoms. Besides the ground-lines and gangings, the buoys, buoy-lines, and anchors had to be made ready, but as these have already been mentioned, they will need no further notice here. In doing these things, the men would sometimes be in the cabin, forecastle, or on deck, just as convenience and fancy inclined them.

June 19.—I have the following short note: "The men are very kind and obliging, and although they may be very rough in their language toward each other, they are ready to help one another out of trouble." I, at no time during the trip, felt in the least like altering the above.

Saturday, June 14.—"I would like to put down some of the conversation of the crew, but there is too much profanity and vileness mixed with it to allow of its appearing on paper." This, I am sorry to say, was true to the end of the trip, but it did not appear that they meant all that they said, but spoke from habit. Such expressions as "A d——n nice thing" were common, where the objectional word increased the emphasis of the word nice. A few words upon the peculiarities of their oaths would be interesting but not proper. Leaving out the profanity, the conversation consisted principally of stories of past experiences on land and water. Some of the men had been regular sailors, and, having visited many parts of the earth, their opinions were interesting if not always correct. For instance, one of them, among other sage remarks, asserted that guano is not composed largely of bird excrement, but is nothing but foul air.

The only difference between Sunday and any other day in the week was that no nail must be driven on that day, for they said that would "nail the trip." Their superstitions are a little curious. The old notion that any enterprise commenced on Friday would be unlucky has, in a great measure, disappeared, on account of the fishermen having read in the papers a long list of great events that had happened on Friday. The objection to hammering on Sunday was so strong that the captain delayed fixing a part of the rigging from Sunday until Monday on this account.

There is one superstition about which they are exceedingly particular. They will never leave a hatch upside down. I was in the cabin fixing the fire, and had taken up the hatch in the floor to get at the coal, which was kept in the bottom of the vessel, beneath the cabin floor. The hatch I had placed in such a manner against the side of the

cabin, that, if it had fallen down, it would have been bottom side up. One of the fishermen, whom I had always regarded as very sensible, seeing the hatch in that position, said to me, "Mr. Scudder, don't leave the hatch that way," and when I asked him why, he explained, that if it should slip down it would be upside down, which would bring ill luck upon the whole trip. I replied, "Let's try it," and knocked the hatch down on the floor bottom up. I do not remember of ever having been more surprised than I was to see him jump to turn the hatch over. He then said, "I don't know what the captain would say if he saw that." One of the fishermen told of a captain he was with who swore terribly at him because he pushed a dory off from the vessel with the bow of the dory toward the sun. I found, however, some difficulty in getting the men to acknowledge their belief in many superstitions, and I should not have found out those I have mentioned, had not the incidents spoken of called them into action. I think, as a whole, they were, for sea-going men, remarkably free from superstition.

The food during the trip was excellent of its kind. Fresh meat and vegetables were, from the nature of the case, out of the question, but the salt meat could not have been better, and fresh halibut and cod, while the fishing continued, were ever available. There was no milk of any kind, and no canned vegetables. Only enough potatoes were taken to last a few days. A little variety was noticed in the meals on Sunday, for on this day the cook added baked beans and brown bread to the bill of fare. Pea soup was common. Tea was prepared for each meal, and coffee for breakfast, and occasionally also for dinner, but both of these had to be taken without milk. Rice pudding and the famous dish of "duff" appeared occasionally. Neither were we without our mince pies, for the cook made some very fair ones out of dried apples and salt meat. Sugar, butter, and molasses were only wanting the last two weeks. The water of Greenland was excellent, as well as that taken from Gloucester. The food was nicely cooked, and many a housekeeper would be proud could she make such bread and cook such dishes as we had, with similar materials. Though the food was good and healthy, condensed milk and canned vegetables would have been a great addition.

The most regular meal was dinner, which came about noon. The other meals were more or less interfered with by the fishing, but while we were on the passage out and back breakfast came about 6 a. m. and supper about 5 p. m.

With the exception of the captain, all the fishermen used tobacco, both by chewing and smoking, and when, toward the end of the trip, tobacco became scarce, some would save their quids for smoking, after drying. Smoking must come before and after every important operation.

There was no severe sickness during the trip. One of the crew had what appeared to be the quinsy sore throat, which prevented him taking an active part in the fishing for several days. The captain seemed threatened with consumption and was confined to his bunk a day or

two. All were more or less troubled with running sores on hands and wrists, which soon healed after the fishing was over. These were probably caused by the fish slime, as several of the men showed me scars of similar sores they had had on former trips. I had two such sores, caused by fish slime getting into slight cuts, and lasting over two months, but which healed rapidly while coming home.

The course taken coming home was the reverse of that going. Those who have been to Greenland after halibut several years, say that after August 20 the weather will permit of but little fishing. Our captain, however, having some salt left, decided to remain a little longer, so we did not start for home until the 28th of August. Then followed the active preparations for going home. The first thing was the bringing on board the barrels of fins, and the careful heading up of these. Next came the repacking of the flitches. After flitches have been packed ten or twelve days, for the first time, they are usually repacked in a more compact form and a little more salt added. During the fishing the packing had been mostly forward of midships, so that the bow of the vessel was low down in the water, and to trim the vessel better the flitches were repacked farther back. The trawls were also unrigged and packed away in the hold, but the cleaning of the vessel was left until we were south of the Strait of Belle Isle.

The decks being cleared, and the dories lashed in their places amidships, we started for home August 28. For the first few days the wind favored us, but before reaching Belle Isle died out, and most of the time after that was unfavorable in direction or a dead calm.

Getting south of the Strait of Belle Isle we found the climate much different from that in Davis' Strait. The captain had brought a bushel or so of very fine black sand from Holsteinborg, and this was now used to scrub the vessel clean of fish slime, that had been collecting ever since the fishing commenced. The crew likewise took a general wash, many of them having their hair cut by one of the crew, who was quite proficient in that way. Vessel and crew both seemed transformed.

The passage home was uneventful, the crew being unemployed the greater part of the time. Some read, others walked the deck smoked if they could get tobacco, and lay in their bunks. Most of the food gave out, until toward the last nothing but salt meat and bread were left. We reached Gloucester the 17th of September.