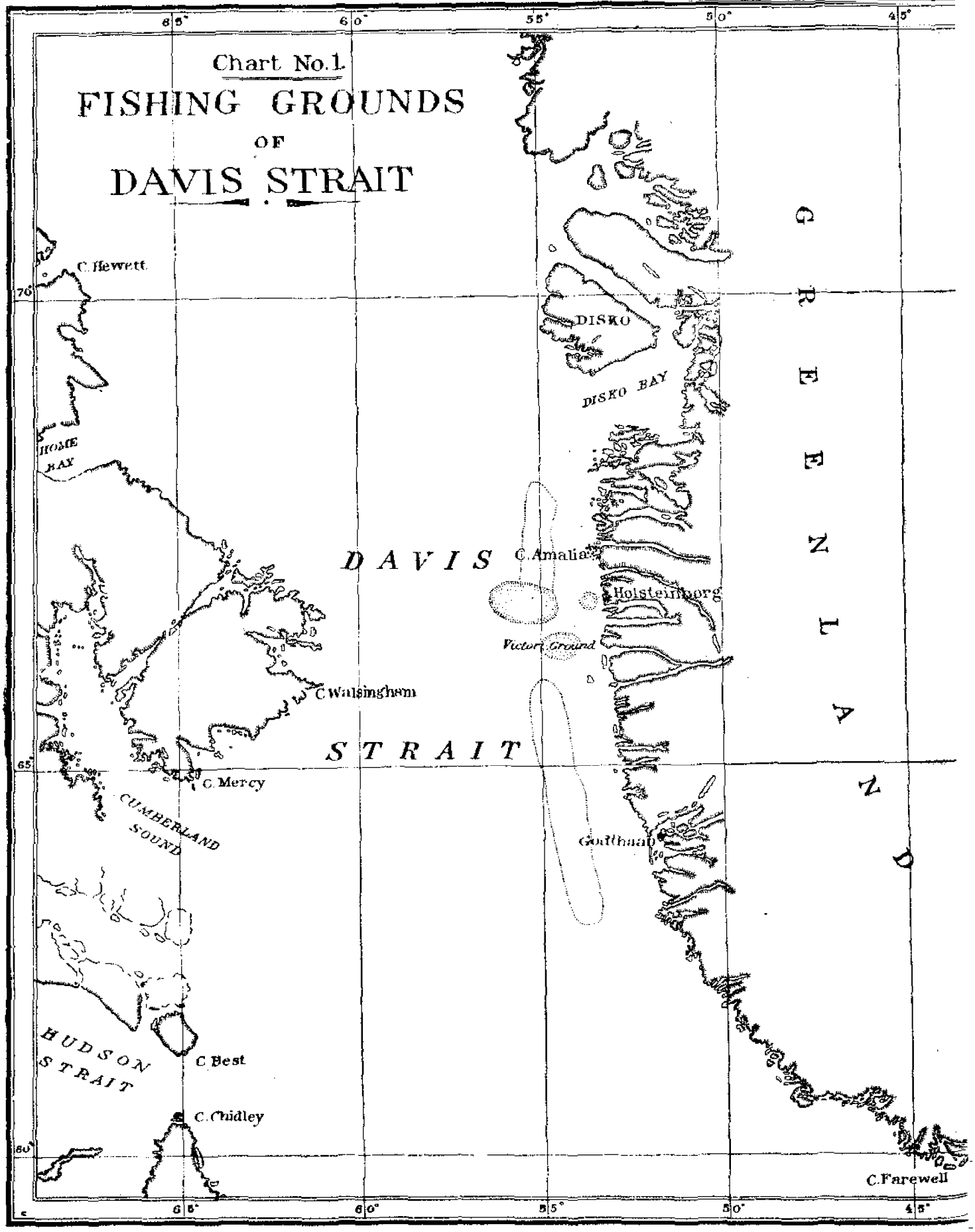


Chart No. 1.
FISHING GROUNDS
OF
DAVIS STRAIT
65°
60°
55°
50°
45°
70°
C. Hewett
DISKO
DISKO BAY
HOME BAY
GREENLAND
DAVIS
C. Amalia
Holsteinborg
Victoria Ground
C. Walsingham
STRAIT
C. Mercy
CUMBERLAND SOUND
Godthaab
HUDSON STRAIT
C. Best
C. Chidley
C. Farewell

THE FISHERIES AND FISHING INDUSTRIES OF THE UNITED STATES.

FISHING-GROUNDS.

A.—THE SEA FISHING-GROUNDS OF THE EASTERN COAST OF NORTH AMERICA FROM GREENLAND TO MEXICO.

By Captain Joseph W. Collins and Richard Rathbun.

1. THE FISHING-BANKS OF DAVIS STRAIT.

The most distant fishing-banks resorted to by the American fishermen on the Atlantic coast are those of Davis Strait, off the coast of Greenland, which abound in halibut and also furnish some cod. They are not much visited by fishermen, on account of the short duration of the fishing season, the possibility of being detained by ice in the passage out, the uncertainty of obtaining a full fare, and the great distance of the grounds from the fishing ports. Notwithstanding all this, however, quite a number of successful trips by Gloucester halibut vessels are on record, and were the localities better known and better mapped out, they might develop into very profitable fishing-grounds. During the summer of 1879, Mr. N. P. Scudder, assistant on the United States Fish Commission, made a trip to this region on the Gloucester schooner "Bunker Hill," and from his report of the cruise we extract the following account of the fishing-banks and their chief characteristics.

From the want of proper surveys it is impossible to mark out, with any degree of accuracy, the exact position and entire extent of these fishing-banks. The Danish charts indicate a line of soundings just off the coast of Greenland, extending from near Disco Bay in the north (about latitude 68° 15′ north) to near Lichtenfels in the south (latitude 63° 20′ north), and ranging in depth from fourteen to seventy-five fathoms and more. Over very extended areas, however, the depths are not greater than thirty fathoms. It is more than likely that these soundings continue farther along the coast toward Cape Farewell, for the reason that icebergs become stranded there, but there is no indication of them on the charts. The distance of the center of this line of soundings from the Greenland coast is about twenty miles, and the fishing-grounds have been stated to lie from twenty to forty miles from land. Immediately outside of the banks, and on the inner side also, there is much deeper water, the slopes being often very abrupt. Only a small area of these fishing-banks have been visited by American fishermen—that portion lying between Holsteinborg and Sukkertoppen, and off Cape Amalia.

That halibut are to be found throughout their entire extent is more than probable, for the species is identical with that taken on the Grand Banks, and we should naturally infer that these fish would be found in all favorable situations within the limits of their distribution. It is also reported that Capt. Rasmus Madison, who has made several trips to Greenland, set his trawls for halibut farther to the south (probably off Godthaab) and found them very abundant, but was unable to secure many on account of the numerous ground sharks, which destroyed his trawls.

The depth of water on the banks ranges from twenty to fifty fathoms, and this makes fishing easier than on the Grand Banks, where halibut can be found abundantly only along the outer slopes in much deeper water. The inner edges of the banks slope abruptly, so as to form between the banks and the main-land a long and narrow submarine valley, whose depth has not been determined. The surface is of a varied character, though generally rocky, with sandy and muddy spots scattered here and there.

The fauna of the banks, as determined at the locality to which the Gloucester fishermen resort, by specimens brought up on their hooks, varies considerably in different localities, and often abruptly. Halibut would take the hook readily in certain places, and very seldom in others close at hand. The former areas were generally found to be covered with immense quantities of an Ascidian, called sea lemon, and the latter with miniature forests of tree corals (Gorgonia). When the fishermen struck the latter kind of bottom they were generally certain not to obtain many fish. While this coincidence may hold good for this one region, it cannot be considered of any importance alone, and the differences probably depend on some other unexplained causes. On the more southern fishing-banks, the presence of Gorgonian corals in no way interferes with the abundance of fish. An examination of the stomachs of the halibut captured in some places disclosed mostly crustaceans and in others mostly small fish. Halibut were the only edible fish caught in sufficient numbers to prepare for market. Some cod were taken, but not enough to pay for salting, and they were eaten on board.

According to Dr. Henry Rink,[1] cod do not spawn on the coast of Greenland. At any rate spawners are very rarely taken, and during the winter cod are wholly absent from the coast. "Sometimes in spring a great many quite young ones arrive at the inlets between 60° and 61° north latitude, which would seem to suggest that their breeding places were not far off, but they generally make their appearance after June 20 on the fishing-grounds, which are situated between 64° and 68° north latitude, at a distance of sixteen miles from the shore, and in July and August resort to the inlets up to about 70° north latitude. With regard to numbers, the occurrence of codfish on Greenland shores is peculiarly variable. Some years, or certain periods of few years, may prove extremely favorable as regards the catch; whereas others turn out a total failure. The number annually caught by the natives may be estimated at somewhat about two hundred thousand fish on an average." According to the same author, "the larger halibut (*Hippoglossus vulgaris*) occurs on the banks, as well as in different places outside the islands, up to 70° north latitude, in depths of from thirty to fifty fathoms. Of late the capture of this fish has become an object of commercial speculation, and foreign ships, chiefly American, have been engaged in it, apparently with better success than that of the codfishing. A halibut of this species weighs from twenty to one hundred pounds, and its flesh is fat and much valued. Superior in taste as well as fatness is the smaller halibut or 'Kaleralik' (*H. pinguis*[2]), which is angled for in the ice fiords at depths of about two hundred fathoms." The other edible fish mentioned by Dr. Rink as inhabiting these fishing-banks are as follows: The lumpfish (*Cyclopterus lumpus*), perhaps the fattest of the Greenland species, which goes inshore in April and May for the purpose of spawning, and forms at this season,

[1] Danish Greenland, its people and its products. English version. London, 1877.

[2] *Platysomatichthys hippoglossoides.*

during a couple of weeks, the chief food in certain places. "The Norway haddock (*Sebastes Norvegicus*) is found only in certain though pretty numerous grounds south of 80° north latitude. The capelin (*Mallotus villosus*) has from times of old yielded the most profitable fishery to the Greenlanders, and may, in a dry state, in winter time, frequently be said to have constituted the daily bread of the natives. They are shoveled on shore by means of small nets, by women and children, and spread over the rocks to dry during four weeks of May and June, when they crowd to the shores of inlets south of 70° north latitude to spawn. This fishery has now considerably decreased, but may still be considered to yield one and a half million pounds weight or more of undried fish yearly."

The best harbors for the fishermen resorting to these banks, in the regions now visited by American vessels, are those of Holsteinborg and Sukkertoppen. Both are good places of shelter. Holsteinborg, the only one visited by Mr. Scudder, is surrounded by the high mainland on three sides, and is shut in on the outer side by several islands. It is thus completely protected from rough water, and the only wind that can enter must come from the side toward the strait, from which direction there are seldom any severe blows. The depth of water is ten to twenty-five fathoms. Holsteinborg and Sukkertoppen are ninety miles apart, and, as the best fishing was found midway between them, there was a good opportunity for running into shelter whichever way the wind might blow. On most of the trips that have been made it has been necessary to make a harbor three, or even more, times a month, on account of severe southwest and northeast winds, which, combined with the strong tides in such shallow water, soon produce a heavy sea.

The best season for fishing on these Greenland Banks is during July and August, although August is preferable to July. This is due to the character of the weather, temperature, etc., at that time, as well as to the greater abundance of fish then on the passage to and from the banks. Mr. Scudder found the temperature during July to vary from 36° F. to 49° F., and during August from 38° F. to 52° F. The mean and maximum temperatures of the surface waters during these months were 38$\frac{3}{4}$° F. and 43$\frac{1}{4}$° F. The climate at this season is, therefore, very favorable for work. The harbor of Holsteinborg is usually open by the middle of May, and fishing might begin by the first of June if vessels were stationed at this place; but the ice coming down the east coast of Greenland blocks up the more southern harbors, and interferes with the passage of vessels north until at least the middle of June. Then, again, winter begins to set in during the last part of August, putting a stop to all operations until the next year. The only icebergs seen by Mr. Scudder came from the south.

The tidal currents are not regular, and near the edges of the banks are very complex. In this locality the tide runs up the strait much longer and with greater velocity than in the other direction. In fact, some days there was no tidal current at all down the strait, but during the time when this current should have been running the water remained slack for seven or eight hours; also, instead of changing every six hours it would do so only twice a day. The greater velocity of the tide running north compared with that running south is probably due to the existence of a regular current on the east side of the strait running up the coast of Greenland. This strong northern flow renders fishing impossible for five or six hours at a time; but as the period of slack is usually equally long, there need not be any great loss of time, as the fishermen can arrange to sleep during the flow and fish during slack water. The nights are light enough in this latitude in July to permit of fishing being carried on at all hours during the twenty-four. The tides and currents are not, however, as simple as the above account would seem to imply; often in changing the position of the vessel only a few miles, an entirely different combination of currents would be met with. The tides running out of the many fiords along the coast of Greenland make

themselves felt a long distance from the shore. The fish seem to take the hook best about the close of the strong tide, and then it is that both hand-lines and trawls are most successfully used.

Temperature observations of the air and water, on the Greenland Fishing-Banks, by Mr. Scudder.

[Latitude about 66° north.]

Date.	Time of day.	Depth.	Temperature.
1879.			°F.
July 6	3 to 4 p. m.	Air	38
		Surface	38½
		10 fathoms	37¾
		20 fathoms	36⅝
		30 fathoms	35½
		40 fathoms (bottom)	35½
July 7	3 to 4 p. m.	Air	40½
		Surface	36½
		10 fathoms	37½
		20 fathoms	36½
		30 fathoms	35½
		40 fathoms (bottom)	35½
Aug. 2	7.30 to 8 p. m.	Air	44
		Surface	42½
		10 fathoms	39½
		20 fathoms	38½
		30 fathoms	38
		37 fathoms (bottom)	37½
Aug. 5	7 to 7.30 a. m.	Air	46½
		Surface	41½
		35 fathoms (bottom)	37
Aug. 8	6 p. m.	Air	45½
		Surface	43½
		24 fathoms (bottom)	37½
Aug. 20	8 to 8.30 p. m.	Air	44
		Surface	46
		25 fathoms (bottom)	38½

The last set of observations was taken about forty miles west-southwest from Holsteinborg.

2. THE ATLANTIC COAST OF LABRADOR.

The existence has been known, for a great many years, of very extensive fishing-grounds along the northeastern coast of Labrador, between latitudes 53° and 56° north. As early as 1758, these grounds were visited by American fishermen, and from the collection of the Massachusetts Historical Society for 1792 we extract the following brief description of that region, as obtained from Captain Atkins, who visited it in the former year (1758):

"The coast is very full of islands, many of them very large, capable of great improvement as they have more or less fine harbors, abounding in fish and seal, water and land fowls, good land, covered with woods, in which are great numbers of fur beasts of the best kind. Along the coast are many excellent harbors, very safe from storms; in some are islands, with sufficient depths of water for the largest ships to ride between, full of codfish, and rivers with plenty of salmon, trout, and other fish. The entrance of Hancock's Inlet in 55° 50′ latitude; a very fair inlet; very little tide sets in or out; from fifteen to twenty fathoms of water going in; five hundred sail of ships may ride conveniently in this harbor secure from any storms. On the east side the harbor is a natural quay or wharf, composed of large square stones, some of prodigious bulk. . . . The harbor abounds in codfish, very large, that a considerable number of ships might load there without going outside, which may be cured on the shore and the quay, except in very high tides."

Not very much, however, was ever made known regarding the North Labrador fishing-grounds until 1876. Prof. H. Y. Hind, who had explored them in the interest of the Newfoundland

Government, published a report of considerable length on their extent and character. From this report we have extracted the following more important facts concerning the region:

"The fishing-grounds on the Atlantic coast of Labrador as far north as Sandwich Bay have been occupied to a greater or less extent for one hundred and twenty years. Those extending from Sandwich Bay to Cape Harrison (Webeck) have also been visited by fishing craft for a generation or more; but north of Aillik, about forty miles from Cape Harrison, the coast has only been frequented by Newfoundland codfishing craft during the last fifteen years. . . .

"The leading characteristics of the coast northwest of Aillik are as follows:

"1. The shore line is deeply serrated by a constant succession of profound and narrow fiords, stretching from thirty to fifty miles into the interior.

"2. It is fringed with a vast multitude of islands, forming a continuous archipelago from Cape Hillete to Cape Mugford, averaging twenty miles in depth from the mouths of the fiords seaward,

"3. Outside of the islands, and about fifteen miles seaward from shore, are numerous banks and shoals, which form the great autumnal, spring, and summer feeding grounds of the cod; while outside the shoals there appears to be a second range of banks, which are probably their winter feeding ground.

"4. The island-studded area forms an immense codfishing ground, which covers between Cape Harrison (Webeck) and Cape Mugford a boat fishing-ground (exclusive of the banks or shoals outside) nearly as large as the combined area of the English and French boat fishing-grounds on the chart of Newfoundland.

"For the sake of distinction, I have styled the area under review 'The Northern Labrador fishing-grounds,' beginning at Cape Harrison (Webeck), and, for the present at least, terminating at Cape Mugford."

The following table by Professor Hind shows approximately the area of the boat fishing-grounds about the island of Newfoundland, as compared with those of Northern Labrador. From this table it will be seen that the area of the Northern Labrador fishing-grounds alone, exclusive of the banks, is equal to about five-sixths the entire area of the British and French boat fishing-grounds on the coast of Newfoundland. The area of the inner range of banks cannot be even approximately stated.

Comparative table of the Northern Labrador and Newfoundland Fishing-Ground areas.

[In geographical square miles.]

Cape Harrison to Mugford, 260 miles, average 20 miles deep	5,200
NEWFOUNDLAND BOAT FISHERY.	
French shore, Cape Saint John via Cape Bauld to Cape Ray, 696 miles, by 3 miles deep, shore boat fishing	2,088
South shore of Newfoundland boat fishery, Cape Ray to Cape Race, 573 miles, by 3 miles deep, shore fishery	1,719
East shore of Newfoundland boat fishery, Cape Race to Cape Bonavista, 294 miles, 3 miles deep, shore fishery	882
Northeast shore of Newfoundland boat fishery, Cape Bonavista to Cape Saint John, 225 miles, 3 miles deep, shore fishery	675
Northeast shore of Newfoundland boat fishery, among islands in Bonavista Bay and Bay of Notre Dame, 120 miles, 7 miles deep	840
Area of British Newfoundland boat fishery	4,116
Area of French Newfoundland boat fishery	2,088
Total area of Newfoundland boat fishery	6,204
Area of Northern Labrador boat fishery, Cape Harrison to Mugford	5,200

Professor Hind attributes the formation of the inner banks to ancient glaciers, which once occupied the fiords along the coast. Regarding this subject he wrote as follows:

"But the glaciers of Labrador have probably left even more valuable records in the form of moraines of their early existence here than deep fiords or innumerable islands. These are the shoals or banks which lie some fifteen miles outside of the islands, and on which icebergs strand in long lines and in groups. I have styled them the inner range of banks, to distinguish them from a supposed outer range in deeper water, and where larger icebergs also sometimes take the ground. The inner banks, as far as they are known, are stated by fishermen to have twenty to forty fathoms of water on them.

"Commander Maxwell's soundings, between Cape Harrison and Gull Island, near Hopedale, and just outside of the island zone, rarely show depths greater than forty fathoms. In one instance only, in a distance of about one hundred and ten nautical miles, is a depth of fifty-nine fathoms recorded."

The character of the southernmost portion of the outer or Atlantic coast of Labrador is described as follows by Professor Hind:

"The admiralty chart portrays a very important conformation of the Labrador coast line from Saint Lewis Sound to Spotted Island. The trend between the Battle Islands south of Saint Lewis Sound and the Spotted Islands (Domino River), a distance of sixty-five miles, is due north, and, with very few exceptions, there are no islands throughout this distance off the coast; but as soon as the coast line begins to turn northwest islands are numerous, and continually increase in number as far as Cape Mugford, and even toward Cape Chudleigh. Between Capes Harrison and Mugford the island zone may be estimated as having a depth of twenty miles from the mouths of the fiords seaward. The causes of the general absence of islands south of Spotted Islands probably can be traced to the never-ceasing action of northern ice driven on the coast line, when it suddenly makes its southern bend by the influence of the rotation of the earth upon the Arctic current. This current sweeps past the Labrador with a velocity of from one and a half to two miles per hour, and a westerly pressure due to the earth's rotation estimated at about eleven inches; that is to say, the mean level of the sea, on the coast of Labrador, is about eleven inches above the level it would assume if uninfluenced by the earth's rotation. As soon as the ice-laden current reaches the Spotted Islands, it is in part relieved from this pressure by the trend of the coast from southeast to due south. Hence the current changes its course southerly and on to the land. But the effect of this sudden change in the direction of the current near the shore is to throw the icebergs on to the coast from Spotted Islands to Cape Saint Lewis, where they may be seen stranded each year in great numbers. The islands, which doubtless ever existed here, have been removed by constant attrition acting uninterruptedly for ages, and with the islands the moraines lying seaward. We may then trace the cause of the vast difference between the distribution of stranded icebergs south of Spotted Islands and northwest of them. In some cases they are stranded on and near the coast line, wearing it away and deepening the water near it, assisted by the undertow; in other cases they are stranded some fifteen miles away from the island fringe, and are continually adding to the banks the *débris* they may bring in the form of mud streaks from the glacier which gave them birth in the far north and northeast.

"It is more than probable that this distribution of icebergs has a very important bearing upon the food and feeding grounds of the cod, which justifies me for referring here in so much detail to the action of glacial ice."

The following additional accounts of the Northern Labrador fishing-grounds, their faunæ, etc., are also extracted from the report of Professor Hind:

RELATION OF THE CODFISH TO STRANDED ICEBERGS.—"Upon what forms of life do the codfish feed on the Northern Labrador coast, where the summers are so short, the capelin, the herring, the squid, and even lance comparatively scarce, and where icebergs continually abound? The answer may be expressed in one word—crustaceans. These are infinite in number, from the minute sea lice of the fishermen to a large crustacean resembling a prawn. Crabs, too, are very numerous, as well as mollusks. Although the capelin ceases to appear on the coast in large shoals above the latitude of Nain, the herring is not numerous beyond Wkkasiksalik, the squid is not found beyond Domino River, and the lance is the only known Southern Labrador fish which visits the northern coast in great numbers, yet crabs, prawns, and 'herring bait,' with medusæ, occur in vast numbers, and form, with mollusks, the chief food of the cod. The officer in charge of the Hudson's Bay Company's post of Wkkasiksalik informed me that at the more remote northern Hudson's Bay post, if seals were left in the fall of the year for a single night in the nets, the head was sure to be cleaned to the bone by the prawns. He also stated that in the northern water, opposite Hebron, Lampson, and Mactiwack, the cod feed on a small fish bearing a great resemblance to the ordinary tommy cod, but the crustaceans were their chief food. The connection existing between ice and the food of the cod is not apparent at the first glance, but when it is borne in mind that infusorial forms abound in sea water in the immediate vicinity of Arctic ice, and that on these minute creatures larger forms of life find sustenance, which again become the food of crustaceans and different species of fish upon which the cod are nourished, the chain is complete, and the relation of stranded icebergs to fish life on the Labrador coast becomes apparent. It has been shown by the labors of the United States Fishery Commission that the cod, which once existed to a large extent on the New England coast, has been starved out by the destruction of its food, and valuable fisheries ruined, but not beyond the power of restoration if the remedial measures suggested are faithfully carried out and sufficient time allowed. But on the Labrador, particularly the northern portion, through the unfailing advent of Arctic ice, a perennial supply of food is indirectly supplied to the cod, forbidding the idea of starvation on these coasts.

THE INNER RANGE OF BANKS.—"The foundations of the inner range of banks consist very probably, as stated, of glacial moraines. In their present state they may reasonably be assumed to be formed in great part of remodeled *débris*, brought down by the same glaciers which excavated the deep fiords. The absence of deposits of sand in the form of modern beaches on every part of the Labrador coast visited this season (except one) was very marked. The exceptional area observed lies between Sandwich Bay and Hamilton Inlet, Cape Porcupine being the center. It is protected from the northern swell of the ocean by the Indian Harbor Islands and promontory. Here larger deposits of sand are seen, covering many square miles in area. The reason why sandy beaches are not in general found on this coast, notwithstanding that enormous quantities of rock are annually ground up by the coast ice and ice pans driven on the shore, arises from the undertow carrying the sand seaward and depositing it on the shoals or banks outside of the islands. The undertow on this coast is remarkably strong, and it aids the formation and extension of the inner range of banks, and consequently of the feeding and spawning grounds of the cod to a very great degree.

"It may be advisable here to advert to a popular error, which assumes that the depth of water in which an iceberg grounds is indicated by the height of the berg above the level of the sea. It is commonly stated that while there is one-ninth above there will be eight-ninths below the sea

level. This is approximately true only with regard to the balance of a mass of the berg, not with regard to height and depth. A berg may show an elevation of one hundred feet above water and yet its depth below may not exceed double that amount; but its volume or mass will be about eight times the mass over the surface. Hence, while icebergs ground in thirty and forty fathoms of water they may expose a front of one hundred feet or three hundred and fifty feet, the broad massive base supporting a mass about one-ninth of its volume above the sea level."

As to the movements of cod, Professor Hind frames the following table:

Table showing the approximate mean date of arrival of cod, mean date of departure, and mean length of the fishing season for cod in Northeastern Newfoundland, Southern and Northern Labrador.

NEWFOUNDLAND.

[Over 4 degrees of latitude. Mean length of fishing season, 143 days.]

Latitude.	Locality.	Mean date of arrival.	Mean date of close of fishery.
° ′			
47 30	Conception Bay	June 1	Nov. 20
48 20	Bonavista Bay	June 10	Nov. 10
48 30	Notre Dame Bay	June 20	Nov. 10
50 00	Cape Saint John to Partridge Point	June 20	Nov. 1
49 30	White Bay	June 10	Nov. 1
51 00	Cape Rouge Harbor	June 10	Nov. 1
51 30	Cape Bauld to Cape Onion	June 20	Oct. 20

SOUTHERN LABRADOR (ATLANTIC COAST).

[Over 3 degrees of latitude. Mean length of fishing season, 97 days.]

52 06	Chateau Bay	June 20	Oct. 1
	Batteaux	July 12	Oct. 1
54 30	Indian Harbor	July 15	Oct. 1
54 54	Cape Harrison	July 18	Oct. 1

NORTHERN LABRADOR.

[Over 3½ degrees of latitude. Mean length of fishing season, 52 days.]

55 09	Aillik	July 20	Oct. 1
55 12	Kypokok	July 20	Oct. 1
55 27	Hopedale	July 20	Oct. 1
53 30	Double Island Harbor	July 22	Oct. 1
56 00	Wkkasiksalik	July 28	Oct. 1
56 36	Nain	July 28	Oct. 1
57 30	Okak	July 28	Oct. 1
58 30	Hebron	Aug. 15	Sept. 25
58 48	Lampson	Aug. 15	Sept. 25

From this table the following law is deduced:

"Over an area extending northerly from Conception Bay for seven hundred miles the cod approach the shore about one week later for every degree of latitude we advance to the north. These tables show also that for a period of about forty days the codfishing goes on simultaneously during August and September, throughout the length of a coast line extending from latitude 47° to latitude 58° 30′ in one continuous line, or more than seven hundred statute miles; hence it appears that the migrations of the shoals of this fish are merely from deep-water winter fishing-grounds to the nearest coast spawning-grounds, and from the coast to the nearest deep-

water feeding-grounds again. The coast migrations during the summer months appear to be of equally limited extent, and shoals of cod frequenting any particular coast may be said to be indigenous to it. On the Labrador, and especially in such known deep bays as Hamilton Inlet, the coast movements of the fish appear to be very regular, and determined to a large degree by the tidal currents. The capelin generally precede the cod by a few days, and these fish are known to approach the coast and enter the sandy coves for the purpose of spawning. The same law which guides the movement of the cod affects also the spawning of the capelin. I saw numerous shoals of this fish spawning in Trinity on the 27th of June. A month later they spawn in Kypokok Bay, and still later further to the north."

PRESENT STATUS OF THE NORTHERN LABRADOR FISHERY.—"About four hundred fishing craft, from eighteen to ninety tons burden, are supposed to have passed Cape Harrison this season (1876). Taking the average of the entire fleet, they carried each eight men, three fishing-boats and one shore boat. Out of the thirty-two hundred hands we may assume that twenty-four hundred were actually engaged in fishing. The estimated catch was sixty quintals per man, or *in the aggregate one hundred and forty-four thousand quintals. This work was accomplished in* an average aggregate of twenty-four fishing days, and to a large extent with the jigger, that is, without the use of bait. The average weight of the fish is about three pounds fresh. Allowing one hundred and thirty fish to the quintal, the number taken would be about eighteen millions; the number wounded and lost about four million five hundred thousand, although some fishermen consider that one fish out of three is wounded by the jigger and lost when the fish are very numerous."

We have quoted this report of the Labrador fishing-banks so much in detail mainly for its many valuable suggestions bearing upon several of the more southern fishing regions, which have not yet been so carefully studied. It is not probable, however, that American vessels will resort to these distant grounds for some time to come, or until forced to do so by the scarcity of cod in regions nearer home. The size of the Labrador cod is also below the standard recognized in United States markets.

Herring occur at various points along the coasts of Labrador, between the Straits of Belle Isle and Cape Harrison, and are principally taken in the vicinity of the bays and harbors resorted to by the vessels engaged in the cod fisheries of that region. This fishery is in season during the summer, but has at no time been very extensive.

3. THE EASTERN AND SOUTHERN COASTS OF NEWFOUNDLAND.

THE EASTERN COAST.

The eastern coast of Newfoundland furnishes a vast area of boat fishing-ground for cod, extending from Cape Race to the Straits of Belle Isle. Along the same side of the island, squid, capelin, and herring abound to a greater or less extent, and are taken for use as bait principally. There are no fishing-banks off this coast excepting at the southeast corner, just off which the Grand Banks are located. According to Prof. Henry Y. Hind, the extent of the shore codfishing-grounds on the eastern side of this island is as follows:

[In geographical square miles.]

Cape Race to Cape Bonavista, 294 miles, 3 miles deep	882
Cape Bonavista to Cape Saint John, 225 miles, 3 miles deep	675
Among the islands in Bonavista Bay and Bay of Notre Dame, 120 miles, 7 miles deep	840
Cape Saint John to Cape Bauld, French shore, 300 miles, 3 miles deep	900
Total	3,297

The first three estimates given in the above table are exactly as Professor Hind states them; but the fourth estimate has been extracted from his enumeration of the entire French shore, Cape Saint John to Cape Ray, via Cape Bauld, which lies at the outer entrance to the Straits of Belle Isle, on the Newfoundland side. The table given in his report on this region includes the entire French shore in a single item. According to the same authority, the length of the fishing season along the different portions of this coast and the mean date of arrival and departure of the cod for the same are as follows:

Table showing the approximate mean date of arrival of cod, mean date of departure, and mean length of the fishing season for cod on the eastern side of Newfoundland.

Latitude.	Locality.	Mean date of arrival.	Mean date of close of fishing.	Mean length of fishing season.
° ′				
47 30	Conception Bay	June 1	Nov. 20	143 days.
48 20	Bonavista Bay	June 10	Nov. 10	
48 30	Notre Dame Bay	June 20	Nov. 10	
50 00	Cape Saint John to Partridge Point	June 20	Nov. 1	
49 30	White Bay	June 10	Nov. 1	
51 00	Cape Rogue Harbor	June 10	Nov. 1	
51 30	Cape Bauld to Cape Onion	June 20	Oct. 20	

With reference to the construction of this table Professor Hind says: "In framing these tables I have been careful to eliminate extreme seasons, for the cod have been known to approach the shore during an exceptionally early season a fortnight or three weeks sooner than during the average of years. Although squid are abundant along the entire eastern coast, they are principally taken as bait to sell to the United States bank fishermen, toward the southeastern extremity of the island, in Conception, Trinity, and Bonavista Bays. Within the past few years this region has also been resorted to by a few American vessels, who obtain cargoes of squid, principally by purchase, to sell to the French fishermen at Saint Pierre. This traffic has also been participated in to some extent by the provincials, and small steamers have occasionally been employed to collect cargoes at Conception and Trinity Bays, and, perhaps, farther north. Capelin also abound between Saint Johns and Cape Race, and are taken by the natives for the same purpose as the squid. The principal localities furnishing this bait are Saint John's, Broyle Harbor, and Bay of Bulls. The United States fishermen visit this coast only to obtain bait."

Notwithstanding the privileges granted by the Washington treaty, and the award made by the Halifax Commission in payment for the right to fish in these, as well as in the other, provincial coast waters, United States fishermen have been frequently interfered with in the matter of fishing for bait along the southeastern shores of Newfoundland, and the natives have even gone so far as to refuse to sell bait to them, while at the same time they have threatened armed resistance to any persons who should attempt to fish for bait in waters adjacent to the shores. This direct violation of existing treaties has often resulted in the loss of much time to the fishermen, who have been obliged to go elsewhere in search of bait.

THE SOUTHERN COAST.

The fisheries carried on on the southern coast of Newfoundland are for cod, herring, capelin, and squid, and to some extent also for halibut. Herring are taken by the natives to supply the winter trade in frozen fish and to sell to the bank fishermen as bait, and for the latter purpose capelin are also taken in large numbers. The shore fishing-grounds for cod extend along the entire

southern coast of Newfoundland from Cape Race to Cape Ray. Fishing is mostly done from small, open boats, but also, to some extent, by vessels which go as far out as five to ten miles from shore, where the water is of a suitable depth. They seldom fish, however, in deeper water than from fifty to seventy-five fathoms. The fishing-grounds are so continuous that the natives can generally obtain fair fishing without going far from home. The fishing season for cod is from April to October. When in pursuit of capelin and squid, the cod approach so near the shore that they can often be taken in seines and in traps, which do not in many cases extend more than fifty fathoms from shore. The latter mode of fishing has been introduced since 1878, and has been more efficient than the former methods of using seines and lines. The boat fishermen depend principally on hand-lines and trawls, but in the spring, when bait cannot be obtained, they often use a jigger, which is also employed on other parts of the coast.

Off Pass Island, there is a small tract in about one hundred and sixty fathoms, not over five to eight square miles in extent, where halibut were found in considerable abundance for two or three years, from 1870 to 1873. During those years a considerable number of United States vessels resorted to this region, but the grounds soon became exhausted, and little or no fishing has been done since. More recently halibut have been taken off Burgeo Island. The best halibut fishing near this coast has been obtained about thirty miles from the main-land, longitude 58° west and latitude 47° 8′ to 47° 10′ north, over an area about ten or twelve miles square, in depths of one hundred and forty to two hundred and fifty fathoms. This region is now much resorted to for a short period in the spring and sometimes even in winter. Famous halibut grounds once existed off the beach between the larger and smaller Miquelon Islands, in four to eight fathoms, and also in the channel between Saint Pierre and Miquelon. The presence of the halibut there was due to their following the capelin to the shore. The capelin usually remain about a month, and the halibut seldom stay longer, if as long. Halibut are rarely taken now at Miquelon beach in large numbers. Fortune Bay has been the great resort for vessels engaged in the frozen-herring trade since 1865, but this trade is not so extensive now with Newfoundland as it has been in former years, having been largely transferred to New Brunswick. The many long and deep arms of the sea which indent the southern coast of Newfoundland are frequented by immense schools of herring during the winter and spring months. Cargoes can frequently be taken at numerous points along this shore, but, as above stated, Fortune Bay constitutes the principal fishing-ground. This bay is sixty-five miles long and thirty-five miles wide at the mouth, but it gradually narrows toward the center, where it varies in width from ten to twenty miles. The southern coast, although quite rugged and bold, is less so than the northern, and has several sloping shores with sand beaches. The northern coast is cut into by numerous deep and narrow bays or fiords, which are favorite spawning grounds of the herring. Long Bay, the principal fishing point, is usually covered with ice in the winter through much of its extent, but the lower portion remains open and permits of the seining and netting of fish. Among other harbors formerly and now resorted to are Saint Jacques, Bay the North, and Rencontre. The numerous deep coves and harbors on the north side of Fortune Bay, as well as the sandy shores of the south side, afford seining grounds for herring during the spring and early summer. Many herring from these places are sold in the spring to the United States bankers and to the French fishing fleet at Saint Pierre. The capelin are caught with seines on the beaches of Fortune and Placentia Bays, and taken in small vessels to Saint Pierre by the Newfoundlanders, who sell them there fresh to the French. They come in June and remain from four to six weeks. The fishing is done entirely by natives, as in the case of herring, and the catch is sold to the same fishing fleets. As a rule, the French salt

both their herring and capelin bait, but the Americans preserve theirs in ice. The herring remain on this coast more or less through the capelin season and generally all summer; but while the latter fish are on the herring fisheries of Fortune and Placentia Bays are more or less neglected, many of the fishermen of those regions limiting themselves chiefly to supplying the French fishermen with capelin.

The American vessels generally obtain their supplies of capelin north of Cape Race, where the method of capture and preservation is the same as at the south. Placentia Bay is resorted to by American vessels for both herring and capelin bait, but is visited for this purpose much less than Fortune Bay and other localities. Squid are taken for bait in Placentia Bay and other places along the south coast, but, as a rule, the American vessels obtain their squid bait from the bays and harbors on the east side of the island. A species of turbot was formerly taken in considerable numbers in Fortune Bay and vicinity during the winter season from 1855 to 1875. They were generally frozen and sold to the captains of American vessels, who in turn sold them at New York and Boston. Since the decline of the frozen-herring trade in this region, comparatively few American vessels visit it in the winter season, and the turbot industry has ceased, for a time at least, although the fish are probably as abundant now as at any previous time.

4. THE GULF OF SAINT LAWRENCE.

GENERAL ACCOUNT.—Fully one-half of the area of the Gulf of Saint Lawrence, including the bays and channels leading into it, has a depth of water less than sixty fathoms. This shallow portion, which borders the northern and eastern shores of the Gulf to a distance of from six to ten miles from land, but which comprises all the southwestern third at least, forms a more or less continuous fishing-ground of great value and importance. Of late years, as the fisheries of the outer banks and the Gulf of Maine have been more and more developed, United States vessels have resorted to the Gulf of Saint Lawrence much less than in times past, and we are now rapidly becoming independent of this once much coveted fishing-ground.

The western coast fishing-grounds of Newfoundland, from Cape Bauld to Cape Ray, according to Prof. H. Y. Hind, constitute a boat-fishing area for cod nearly four hundred miles long by about three miles deep. The rights of this fishery belong to the French by treaty, a privilege also enjoyed throughout most of its extent by citizens of the United States. A similar fishing-ground, *though of less importance, borders the northern coast of the gulf and the island of Anticosti.* Places worthy of note along this shore are the Natashquan cod-bank and the Mingan Islands. This group of very small islands lies between the western end of Anticosti and the north shore, and between the meridians of 63° and 64° west longitude. About sixteen islets, the largest not over five miles long, with a number of small rocky spots, are marked out on the admiralty chart *as composing the Mingan Islands. Their distance from land varies from two to seven miles,* the depth of water among and about them varying from four to forty-seven fathoms. They are scattered irregularly, the bottom between them consisting of sand, gravel, rocks, and shells.

The southwestern portion of the Gulf furnishes by far the most extensive and important fishing-grounds. The area within the limits of the sixty-fathom line reaches about one hundred *and eighty miles eastward from the coast of New Brunswick and about one hundred and forty* miles northward of Nova Scotia, and includes the well-known Magdalen Islands and Bradelle Bank.

There is great uniformity in the depth of water and the character of the bottom nearly everywhere, the bottom being generally rocky and diversified with areas of greater or less extent of sand, gravel, or mud.

Chart No. 5.

FISHING GROUNDS

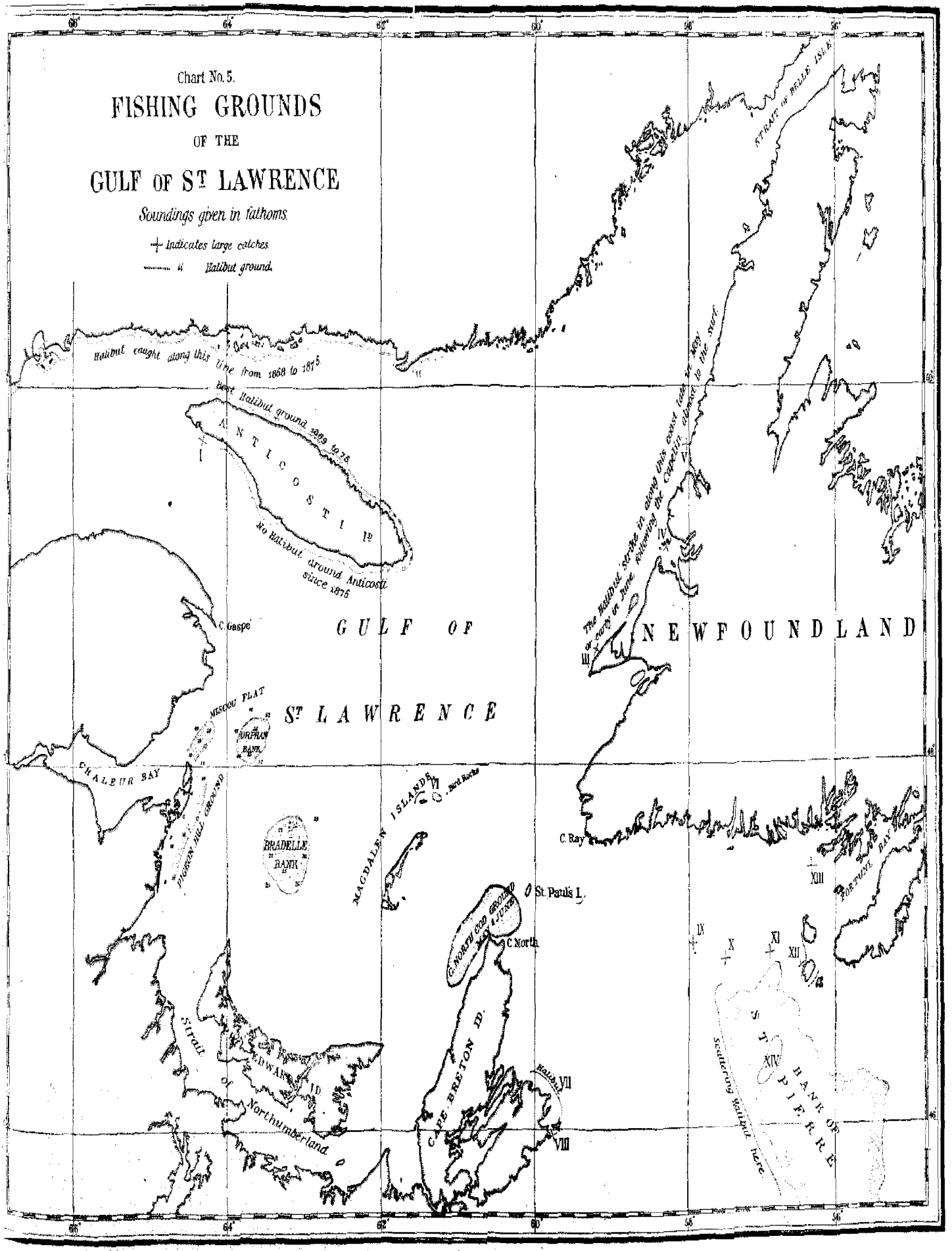
OF THE

GULF OF ST LAWRENCE

Soundings given in fathoms.

+ *Indicates large catches*

——— *Halibut ground.*



ORPHAN BANK, which lies thirty-five miles a little north of east of Miscou Island, at the mouth of Chaleur Bay, is of very limited extent. The shallowest sounding upon it, as indicated on the admiralty chart, is twenty-five fathoms, and this appears in only one spot, while about it and within a radius of eight miles are marked from thirty-five to fifty-three fathoms. The character of the bank and its fauna are thus described by Mr. J. G. F. Whiteaves:

"The Orphan Bank, which is situated off the entrance to the Bay des Chaleurs, is a stony patch, as are most of the inshore fishing-banks, many of which are not indicated or defined on the charts. The masses of rock are usually large pieces of reddish sandstone (often perforated by two species of boring bivalves, the *Saxicava rugosa* and *Zirphæa crispata*), with a small proportion of pieces of Laurentian gneiss, etc. Animal life is profusely abundant here, which is undoubtedly the reason why cod, mackerel, etc., frequent this and similar banks in such enormous numbers. Soft-bodied organisms of various kinds give a special facies to this particular one. These are incrusting sponges; tunicates of many genera and species, some of unusual size; an *Actinia* (*Metridium*); the common northern *Alcyonium* (*rubiforme*); *Alcyonidium gelatinosum*; Hydrozoa and Polyzoa, in great profusion, etc. Among the harder forms are an abundance of the commoner Echinoderms, with a few scarce species; large calcareous Polyzoa, and a large number of fine Crustacea. Shells are tolerably numerous, though not nearly so much so as on the Bradelle Bank, and Annelids were relatively scarce."

The character of the bottom on "Miscou Flat" and about the Magdalens is very similar to that of Orphan Bank, while it is probable that the Pigeon Hill Ground more nearly resembles Bradelle Bank.

BRADELLE BANK.—The Bradelle Bank is of much greater extent than the Orphan Bank. Its center lies about fifty miles west by north of Grindstone Island, Magdalen Islands, and, as laid down on the charts, it covers an area of about thirty miles long from north to south, by about twenty miles broad from east to west. The deepest sounding near the edge is about thirty fathoms and the shallowest twenty fathoms; the soundings mostly range from twenty-one to twenty-five fathoms. The distance from the center of Bradelle Bank to Orphan Bank is about forty miles, the greatest depth between being fifty fathoms. The greatest depth between Bradelle Bank and the Magdalen Islands is from thirty-six to forty-two fathoms. The bottom and faunal characters of Bradelle Bank are described by Mr. Whiteaves as follows:

"The Bradelle Bank is also a stony patch, but the pieces of rock are usually small, and there is a greater admixture of gravel, sand, and mud on this bank than upon the Orphan. Soft-bodied animals appear to be scarce upon the former, and shells occur in unusual abundance. The assemblage of Hydrozoa, Echinoderms, Polyzoa, and Crustacea is much the same on both banks, though a few peculiar species were found on each. The rarer forms found at these two places will be catalogued in the second part of this report. While the animal life of the shores of Cape Breton (except in deep water), of those of the Magdalen group and of Prince Edward's Island, as well as that of the whole of Northumberland Strait up to the southern entrance to the Baie des Chaleurs, is of an Acadian or Southern type, the fauna of the Orphan and Bradelle Banks has a decidedly Arctic or Northern character. The Bradelle Bank, in particular, presents the phenomenon of a small patch tenanted by an assemblage of marine animals which usually inhabit very cold water, and almost entirely surrounded by another series, which are for the most part prevalent where the bottom is warmer and more affected by surface conditions of temperature."

MISCOU FLAT is a stretch of rocky shoal ground that makes out from Point Miscou in an east-southeast direction a distance of nearly twenty miles. There is depths of water upon it of ten to twenty-two fathoms, the bottom gradually falling off to the outer part.

PIGEON-HILL COD GROUND consists of the shore soundings (four to seventeen fathoms) that lie from ten to twenty miles southeasterly from Shippegan Island, New Brunswick, and extends southward along the coast about eighteen to twenty miles.

Codfishing is pursued on all of these grounds—Bradelle Bank, Orphan Bank, Miscou Flat, and Pigeon-Hill Ground—only during the warm seasons of the year (May to October).

The abundance of cod, especially of large fish, varies somewhat with the different seasons, their presence in greater or less numbers being governed to a large extent by the amount of food (herring, mackerel, etc.) on the ground. Miscou Flat and Orphan Bank are noted for large codfish. There are sometimes what appear to be two schools of codfish at the same time on these banks, one of which is caught in the day-time and the other only at night. The first is of small size, but the second is extraordinarily large, being larger than are found at any other locality.

The fishing is mostly carried on by residents of the vicinity in small boats, although some Nova Scotia vessels and a limited number from the United States sometimes engage in it.

MAGDALEN ISLANDS.—The Magdalen Islands, which lie about fifty to sixty miles northwest of Cape Saint Lawrence, Cape Breton Island, form an elongate chain trending in a northeast and southwest direction. The total length of the chain with its outlying rocks is in the neighborhood of fifty to fifty-five miles.

The main group consists of five or six small islands, separated by narrow channels varying in width from a few rods to half a mile. Its greatest length is thirty-six miles and its greatest breadth about five or six miles. The shores of these islands are quite irregular, being very bold and rocky in some portions and in others formed of stretches of sand.

The entire group lies toward the eastern edge of the sixty-fathom limit, but is wholly included within it. The surrounding area, within a distance of five or seven miles of the islands, ranges in depth from four to eighteen fathoms, and contains many small scattered rocky spots or reefs reaching to near the surface of the water. The bottom, as indicated on the charts, is made up of sand, shells, stones, and rocks. A reddish sandstone predominates in the shoal water about the islands. Between the shallower soundings of the islands and Cape Breton Island the depth ranges from twenty-four to seventy-five fathoms, the deepest water extending close along the Cape Breton Island coast. Formerly, when hand-lines alone were used, codfishing was carried on to a considerable extent around the entire group of islands; but since the introduction of trawls United States fishermen have found it more profitable to resort elsewhere. The so-called "sharp bottom" of the region, due to the many rocks and stones scattered about, unsuits it for trawl fishing. Now the codfishing is almost wholly carried on in the open boats of the resident fishermen and by the small vessels belonging to the British Provinces and the French Islands of Saint Pierre and Miquelon. A few catches of halibut have been taken on the shoals about Byron Island, but the appearance of these fish in that locality is so uncertain that the halibut catchers rarely go there.

CAPE NORTH FISHING-GROUND.—Around the northern end of Cape Breton Island is located a codfishing-ground which is of considerable importance for a few weeks in the spring and early summer. It lies between Cape North and Saint Paul's Island, at a distance of four to fifteen miles from land; thence it extends westerly about fifteen miles, and southwesterly, along the coast of Cape Breton Island, as far as Limbo Cove. The shore here is high and steep, so that, notwithstanding the close proximity of the fishing-ground, the depth of water upon the latter is from sixty-five to one hundred fathoms. The bottom is mostly tough clay, but ten to fifteen miles from land some rocky ridges exist. The current sets out from the Gulf of Saint Lawrence toward the southeast, over a portion of the ground, although the direction changes more or less with the trend of the shore.

Strong westerly winds increase the strength of the current, which after a long continuation of them sometimes runs at the rate of two to three miles an hour. As a rule, however, the tides run slowly. Fishing is often hindered by floating field ice, which sometimes prevents the vessels from reaching the grounds until late in the season. About 1860 and 1861, cod and halibut were found abundantly on these grounds; but later the halibut almost wholly disappeared, and for several years they have been taken only occasionally. Cod are still quite plentiful in May and June, at which time they are moving slowly in by the head-land, on their way to the shoaler grounds of the Bay of Saint Lawrence.

This fishing-ground is resorted to by both provincial and United States vessels, but, owing to the difficulties alluded to above, the fleet is usually small.

COD AND HALIBUT GROUNDS.—Vessels from the United States used to frequent the Gulf of Saint Lawrence both for cod and halibut, but mainly for the former species, until the trips became unprofitable from the scarcity and small size of the fish obtained, and until the introduction of trawls, with which better results could be obtained on the outer fishing-banks. Vessels on their way to Northern Labrador would sometimes harbor along the shores of the Straits of Belle Isle, and fish from small boats to make up a portion of their catch. Several attempts were also made for cod by Gloucester vessels on the Natashquan cod-banks, Southern Labrador, but the trips never paid, and the grounds have since been neglected.

From 1868 to about 1875, Gloucester vessels resorted to the southern coast of Labrador, between the parallels of 60° and 66° west longitude, and the coast of Anticosti in search of halibut. These fish approach quite close to the shores in pursuit of capelin or other small fish, and were caught in considerable numbers within two or three miles of the coast, in five to twelve fathoms of water. As a rule, the halibut were of medium size and fine quality, but they were not nearly so plentiful as in the more recently worked "deep water" of the outer banks. The principal disadvantage of carrying on this fishery was that the bait (herring) had to be obtained in the southern part of the Gulf, and would often become old and unfit for use before a school of halibut could be found, as it sometimes happened that a long stretch of shore would have to be skirted in search of the fish; the distance from market was great, and head winds were usually encountered on the passage, at least as far as Canso, and, finally, the fish decreased so much in numbers that the trips would no longer pay. Vessels have visited this region within three years, but none of them have secured good catches. The halibut grounds of Anticosti were mainly on the northern side of the island, with the same depths of water as on the Labrador coast.

The western coast of Newfoundland likewise furnished cod and halibut grounds in former years for United States vessels, but they have also been nearly deserted for the outer banks. The principal localities where halibut were taken were Saint George's Bay, Red Island, Port au Port Bay, Bay of Islands, and Green Point; but no important catches have been made in any of these places excepting Green Point for a number of years. Green Point was given up at the same time as the others, but fishing began there again in 1878, and more or less fish have been taken nearly every year since. At Red Island, a French fishing station, foreign vessels are not permitted to fish, but in a few instances the Gloucester vessels were allowed to carry away all the halibut they could secure by giving over to the French fishermen whatever cod were taken on their hooks. This practice has since been abandoned, however, and United States vessels have never resorted extensively to this region for cod. Several trials for cod were made in the winter of 1861 and 1862, but such small fares were obtained as to discourage the fishermen. Similar attempts have been occasionally made since then, but always with the same results, due perhaps more to the severity of the weather than to the scarcity of fish. It should be remembered, however, that all these attempts were made in

winter, while the provincials and French fish here for cod only in the summer. Much better cod grounds, however, lie nearer the coasts of the States.

MACKEREL GROUNDS.—No positive rules can be laid down as to the appearance of mackerel on the several grounds of the Gulf of Saint Lawrence. Formerly, when these grounds were largely resorted to by vessels from New England, the fishing was principally carried on in the early part of the season (June and July) north of Prince Edward's Island and between there and Cape Gaspé. This section embraced the "West Shore" from Escuminac to Point Miscou, the Bay of Chaleur, Bradelle Bank, Orphan Bank, and the adjacent waters. Later in the season, August and September, the vessels generally visited the waters along the north side of Prince Edward's Island and about the Magdalen Islands. During some years, however, the fishing was continued on the first-mentioned ground throughout the entire summer. As the season advanced, mackerel were generally found in the greatest abundance in the extreme southern parts of the Gulf, especially about the eastern point of Prince Edward's Island, the north side of Cape Breton Island, in Saint George's Bay, and also about the Magdalen Islands. The principal points where good catches were usually obtained on the coast of Cape Breton were in the vicinity of Sea Wolf Island and Cheticamp Island. These places were generally the last visited in the fall. As a rule, when the mackerel were found here at all they occurred in great abundance; but when the schools left this region they were rarely seen again the same season. Mackerel have also been taken in great numbers along the east coast of Cape Breton Island, between the entrance to Great Bras d'Or Lake and Flint Island, and good catches have been obtained there from July until late in October. Their appearance in this region has not always been regular, however, and a season of great abundance is often followed by one of extreme scarcity.

Although the movements of mackerel in the Gulf of Saint Lawrence during the summer and fall months are about as has been described above, they are subject to certain variations at different periods, and it occasionally happens that good fares are obtained about the north shore of Prince Edward's Island early in the season. Again, this locality may furnish the best fishing during August and September one year, and the next year mackerel may be scarce there though very abundant in other portions of the Gulf. The appearance of large bodies of mackerel in the different localities is doubtless much influenced by the abundance of food, the direction and strength of the prevailing winds, and by other causes not so well understood.

In exceptional instances, fares of mackerel have been obtained at the Seven Islands, and Mingan Islands, on the southern coast of Labrador, and also at the mouth of the Saint Lawrence River, from Cape Chatte to Cape Gaspé. On one occasion, at least, a fare was also obtained at Port au Port, on the west coast of Newfoundland. These catches, with the exception of the last named, were obtained chiefly by the crews in boats, either with hooks and lines or with seines, while the vessels lay at anchor in the harbors.

The vessels visiting the northern fishing-grounds were usually provided with a number of dories, and, after the schooners were securely moored, the men would start out at daylight in the boats, trying for mackerel in the coves and along the shores where the vessels could not be taken. As the mackerel were secured they were carried on board the schooners, dressed and salted.

The fishing grounds of the Gulf of Saint Lawrence, though a favorite resort for mackerel catchers when this fishery was carried on exclusively with hook and line, are not well adapted to the use of purse-seines, which are the principal apparatus now employed in the capture of mackerel. The localities to which they usually resort are too shallow for purse-seines, and, again, the mackerel appear less frequently at the surface in the Gulf of Saint Lawrence than off the coast of the United States, and though they may occur at the former place in large numbers,

their presence is not generally as readily detected. Another hinderance to seining in the Gulf is the greater prevalence there of stormy weather, after the month of July, than on the coast of the United States.

HERRING GROUNDS.—The principal fishing-ground for herring in the Gulf of Saint Lawrence is Pleasant Bay, situated at the southern end of the Magdalen Islands, and opening broadly toward the east. The shores of the bay are bold and rocky in some places towards the north, but are low and sandy elsewhere. Its depth varies from three to eight fathoms, the bottom being composed of white sand. The herring arrive about the last of April and continue in great numbers throughout the spawning season, entirely disappearing about the first of August.

Herring also resort to various portions of the coast of the island of Anticosti, situated in the northern portion of the Gulf, about ninety miles from the Magdalens; but the principal herring grounds are about the North Cape, the eastern extremity of the island. Fishing is at its height here during the month of June, and cod vessels failing to load at the Magdalens can reach the island in time to secure a fare. Until the past few years vessels have rarely, if ever, visited this region, as there has been an abundance of fish in more easily accessible places.

Herring visit many localities on the coast of Newfoundland, and are taken to a greater or less extent in all the bays and harbors. The principal fishing-grounds are in Fortune Bay, on the southern side, and in Bonne Bay and Bay of Islands, on the western side of the island. Bonne Bay, which is situated about midway between the Straits of Belle Isle and Cape Ray, is a small, deep-water bay, with two arms, of which the southern one is more frequented by herring, which enter in large numbers. Bay of Islands, about twenty-five miles farther south, is of larger size than the above, and constitutes a more important fishing-ground. Of its several deep-water arms, extending from fifteen to twenty miles inland, the most southern one, locally known as the "Sou'west arm," furnishes the principal fishing-ground. The fish are found in this region during the greater part of the year. They visit it in the early spring to spawn, and remain through the season to feed upon the small crustaceans, which are very abundant in these waters. These fish are mostly captured by the natives, who sell them to the provincial and United States vessels.

The herring when they arrive in the spring are quite poor, but fatten rapidly, and those caught in the fall are considered equal, if not superior, to any others taken on the American coast.

Vessels occasionally visit Bonne Bay and Bay of Islands in the spring, when they have failed to secure a catch at the Magdalens. The principal season, however, is during the fall, the vessels generally arriving in October and leaving before the last of December. They frequently leave earlier than this to prevent being frozen in by the ice, but a number of vessels have been detained by this cause nearly all winter.

A school of herring enters Saint George's Bay, between Nova Scotia and Cape Breton Island, in June, and remains there one or two weeks, during which time the fish are usually very abundant. At this season, the locality is visited by the United States bank fishermen in search of bait. The principal points where herring are taken on the gulf side of Cape Breton Island and Nova Scotia to sell as bait to the bank fishermen are Port Hood, the Judique shore, and Havre Bouche or Knight Inlet.

TIDAL CURRENTS.—Prof. H. Y. Hind, in his account[1] of "the relation of the movements of mackerel in the Gulf of Saint Lawrence to tidal currents," describes those currents as follows:

"There is, perhaps, no part of the world where the tidal waves and resulting currents are distributed in such a remarkable manner as in the Gulf and estuary of the Saint Lawrence.

[1] The Effect of Fishery Clauses of the Treaty of Washington, etc. Halifax. 1877.

"The meeting and overlapping of tidal waves of different ages, that is to say, the tide of to-day meeting the tide of twelve hours ago, and producing a double overlapping tide, is of rare occurrence, and is due to the configuration of the sea bottom conjointly with the relative position of islands and neighboring coast lines.

"Northumberland Straits and the north shore of Prince Edward's Island afford the most remarkable instances on the American continent of the meeting of tides of different ages, and it can scarcely be doubted that the long and continuous line of inshore eddies, produced in a large measure by this singular confluence, conjointly with the low temperature resulting from the mixing of cold underlying with warm surface sea-strata, is the chief cause why mackerel fishing-grounds should be there so close inshore with such undeviating constancy.

"*a. The Prince Edward's Island double tide.*—The tidal wave, entering the Gulf of Saint Lawrence between Cape Breton and Newfoundland, rushes with great rapidity along the edge of the bank forming the boundary of the sixty-fathom line of soundings. It sends off lateral waves toward the Straits of Belle Isle and toward Prince Edward's Island, while the main wave, following the deep water at the edge of the sixty-fathom line of soundings, pursues a rapid course toward and up the Lawrence estuary, and reaches Cape Chatte and Point de Monts precisely at noon on the days of full and change of the moon.

"Regarding for the present the lateral wave which strikes off toward the southwestern portion of the Gulf, we find it split into two portions by the Magdalen Islands; one-half, namely, the eastern part, sweeps past the shores of Cape Breton and reaches the east point of Prince Edward's Island at eight hours thirty minutes, Cape Bear at nine hours, and the middle of the straits opposite Hillsborough Bay at ten hours. Here it meets a flood tidal wave coming down Northumberland Strait from the northwest, but this wave is not the other half of the wave which was split by the Magdalen Islands two hours before; it is the tidal wave twelve hours old, which has been delayed in its detour round the north part of the Magdalens and over the shallows of the Bradelle and Orphan Banks. A line drawn through the Magdalen Islands, Roche's Point, and the mouth of Hillsborough River, in Prince Edward's Island, and Wallace Harbor, in Nova Scotia, will pass through the places where the overlapping of the confluent tidal waves takes place, at the full and change of the moon, near the shores of Prince Edward's Island. . . .

"Admiral Bayfield is of opinion that these waves of different ages, one being twelve hours younger than the other, meet on the north side of the great bight of Prince Edward's Island, between Tracadie Harbor and Savage Harbor. On the Admiralty charts this locality is designated by the words "Tides Meet." The current is inshore toward this point, both from North Point and East Point, and the effect of the indraft is to determine toward the coast line the floating or free-swimming food of the herring and the mackerel. The great bight formed by the concave northern coast line of Prince Edward's Island is the result of ages of action on the part of these confluent tidal waves dragging along the sloping beaches, and washing away the resulting *débris* from the sandstone rocks, of which a large part of this coast line is composed. The ceaseless operation of these forces is thus manifested in the wearing away of the shores most subject to their influences.

"*b. The eddy flood tide in the estuary of the Saint Lawrence.*—According to Admiral Bayfield, the flood tide in the estuary of the Saint Lawrence, beginning at Anticosti and proceeding some miles above Bic, rushes up the broad midchannel as far as Red Islet and Green Island, where part of it, being obstructed by the islands, turns round and, as an eddy flood tide, sweeps along

and down the southern coast as far as Gaspé Basin, only a thin and narrow band of flood tide running upward between the eddy flood and the coast line.

"On the days of full and change of the moon it is high water at noon both at Point de Monts and Cape Chatte, and high water later and later down the coast, so that at Cape Rozier it is one hour thirty minutes before it is high tide there.

"In other words, the flood tide rushing up the deep midchannel between Cape Rozier and Anticosti Island passed up more than an hour and a half before the eddy flood tide returned coastwise to Cape Rozier.

"Bayfield states that there is a very narrow flood tide close inshore running westerly along the Gaspé coast inside of the eddy flood. These currents moving so constantly in opposite directions, and close inshore, tend to produce the continuous line of eddies which cause the free-swimming food of the mackerel to be found near to the land, and make that portion of the estuary a mackerel ground.

"On the north shore of the estuary, between Mingan and Point de Monts, the periods of high water at full change of the moon are altogether different. The tidal wave reaches Mingan Island at 1.30, Seven Islands at 1.40, Cawee Island at 1.50, English Point at 2, and a few miles farther on it meets the ebb tide two hours old sweeping past Point de Monts.

"The flood tide on the north shore is only about three leagues broad. The strength of the stream is greatest inshore, and beyond three leagues from the coast it becomes insensible.[1]

"The eddies produced in the bays between Moisie and Point de Monts by this inshore flood tide throw in and keep the food near the coast line.

"Hence it is that the flood tide on the north shore flowing westerly and the eddy flood on the south shore flowing easterly, with a thin belt of westerly flowing flood between it and the land, produce inshore eddies, which concentrate the free-swimming food of the mackerel, hereafter described, on these coasts.

"The strength of the current in deep water off shore, on the south coast of the estuary of the Saint Lawrence, is stated to be sufficient to prevent fishing operations there, thus offering a practical difficulty, which is repeated on some parts of the northern shore during high tides.

"In the Bay of Chaleurs, where the tides are regular, the mackerel ground of the day depends upon the wind. A southerly wind converts the south side of the bay into a lee shore, and the fish are found chiefly on that side, especially toward Nepissignit Bay. When the wind is northerly *the Gaspé becomes a lee shore, and the fish are chiefly found between Bonaventure Island* and Paspebiac, and on toward Cascapedia Bay. It has already been observed that mackerel and surface feeders generally swim with open mouths against the wind and tide. The cause which brings the mackerel from the south shore to the north shore arises from the fact that in the natural pursuit of their surface food against the wind they are brought up by the land, and finding food in the tidal eddies there, they pursue their course inshore against the tidal currents, until a change in the wind induces them to cross again to the opposite shore, where similar conditions prevail. On the gulf coast of Cape Breton the set of the currents is oftentimes inshore."

5. THE OUTER COASTS OF CAPE BRETON ISLAND AND NOVA SCOTIA, INCLUDING THE BAY OF FUNDY.

OUTER COAST OF CAPE BRETON ISLAND AND NOVA SCOTIA.—Shore fishing-grounds for cod exist along the entire outer coast of this region. They are located on the so-called shore soundings, which range in depth from about ten to fifty fathoms, the average width of this coast belt being

[1] Sailing Directions for the Saint Lawrence.

about eighteen miles. Fishing is mostly carried on beyond three miles from shore, though some boats fish much farther in, and begins about the first of May and lasts until October; it is mainly in the hands of the provincials, although a few vessels from the United States resort to the region occasionally. Saint Ann's Bank is a cod-fishing ground on the shore soundings off the east end of Cape Breton Island, which is mainly fished upon by the people living on the adjacent shores.

For a number of years several American vessels were in the habit of visiting the halibut grounds in the vicinity of Flint Island and Scatari Island, Cape Breton, and a number of good fares of halibut were obtained there. The grounds were of small extent, however, and soon became exhausted. No important trips have been made to that region since 1875. Halibut have rarely been taken in large quantities on the coast of Nova Scotia.

Herring are abundant at numerous points along this coast, and are mainly taken to supply the United States and provincial vessels with bait. The Peninsula of Halifax, especially about Prospect, is a great baiting station, and other similar stations occur all along shore between Cape Sable and Canso. Mackerel make their appearance about the western part of Nova Scotia in May, and follow eastward along the coast until they arrive at Cape Canso, where they turn northward, entering Chedabucto Bay and passing through the Strait of Canso into the Gulf of Saint Lawrence. They come from the south and southwest, and appear to strike the entire coast at very nearly the same time, arriving at the eastern end, however, a little later than at the western, the schools gradually working eastwardly. At the same time large quantities of mackerel pass around the east end of Cape Breton Island and thus reach the Gulf of Saint Lawrence. In the fall they return by the same route, and continue to pass up the coast until about the last of November; but some seasons they remain later and others they are earlier in their migrations toward the south. As a rule, no mackerel of any account are on this coast from the 1st of July to the 15th or 20th of September; some schools of small fish remain the entire summer. They are captured in gill-nets, seines, pounds, and traps; but during their fall migrations it is not always safe to set the nets far from land on account of the severity of the weather. The mackerel fishery of the coast of Nova Scotia and Southern Cape Breton is of slight importance compared with that of the Gulf of Saint Lawrence, as the fish remain in the first-mentioned localities for a much shorter time, and are taken only by the natives along the coast.

BAY OF FUNDY.—The only important fishery at present in the Bay of Fundy is that for herring. Mackerel occasionally enter Saint Mary's Bay and other places at the mouth of the Bay of Fundy, and from 1835 to 1850 this region was considered a famous mackerel ground. During the last thirty years, however, it has been but rarely visited by United States vessels. Fair catches of halibut were formerly obtained at the mouth of the bay, in from thirty to sixty fathoms, and even farther in than Bryer's Island, but for the past fifteen years this fishing, like that for mackerel, has not been profitable. Cod-fishing is carried on near the mouth of the bay, but not to any great extent, mainly because of the strong tides, which are not favorable to it. The Grand Manan Ripps were formerly the most celebrated herring-grounds on the northern coast, and were much resorted to by American vessels. The fishery has, however, been gradually transferred to the coast of the main-land about the mouth of the Bay of Fundy, especially on the north side, although herring are also taken in considerable quantities in and about Saint Mary's Bay, on the southern coast. The herring approach Grand Manan in July, and remain there until the middle of September. Toward the last of October other schools arrive upon the shores of the main-land about Campobello Island, and later, during midwinter, the waters between Eastport, Maine, and Point Le Preau, New Brunswick, become crowded with them. They enter Saint Andrew's Bay and remain until late in the spring. The fishery begins to the westward, commencing first about Grand Manan and

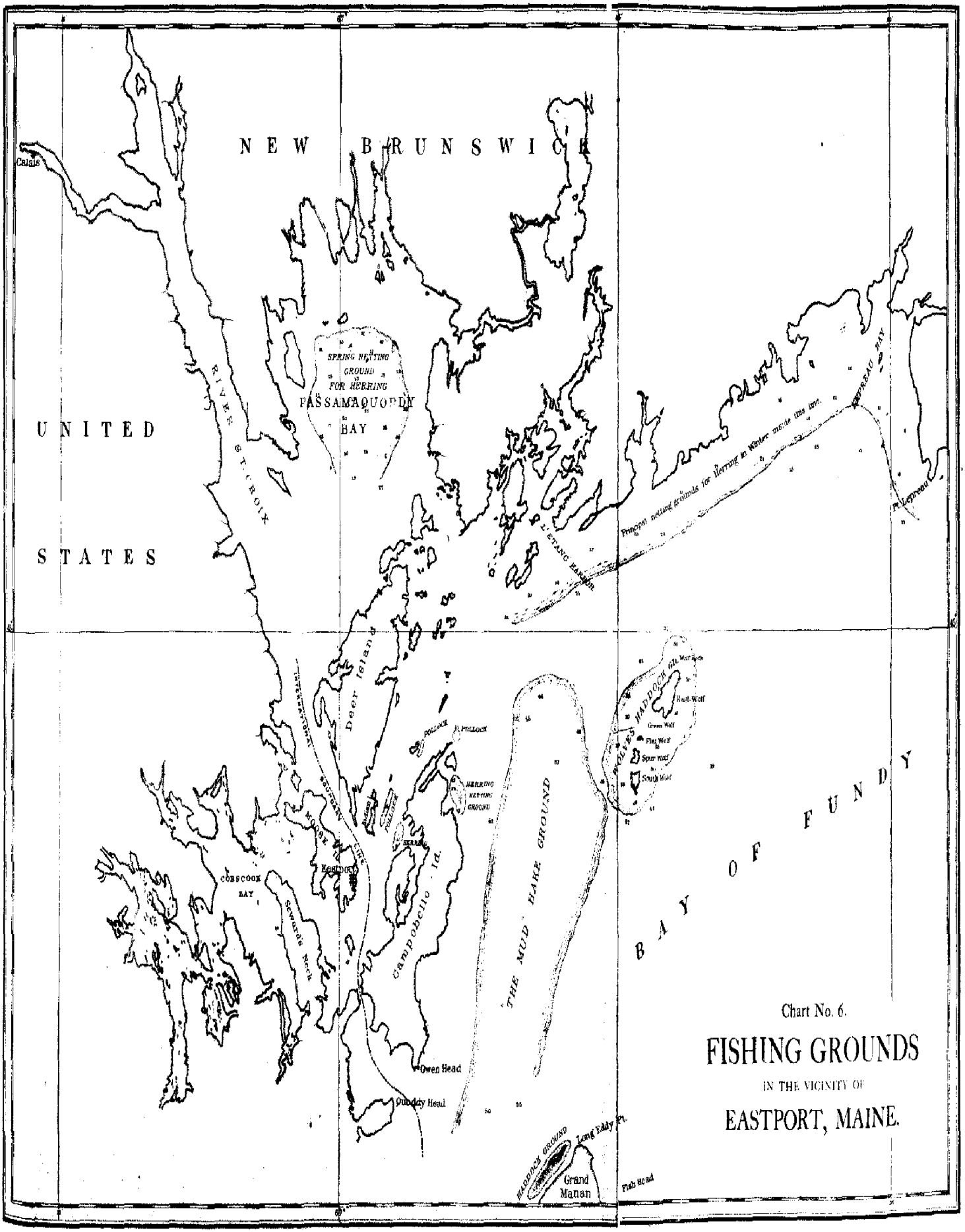


Chart No. 6.

FISHING GROUNDS

IN THE VICINITY OF

EASTPORT, MAINE.

Campobello, and continues later about Point Le Preau and in Saint Andrew's Bay. These fish are taken to supply the frozen-herring and sardine trade, and to sell to the bank fishermen as bait.

There are a few distinct grounds for hook and line fishing at the mouth of the Bay of Fundy, located and characterized as follows:

THE WOLVES HADDOCK GROUNDS.—Around the group of islands called the Wolves, which lie off the southwest coast of New Brunswick, the bottom is composed of rocks and gravel for a distance averaging about three-quarters of a mile from the shore. This narrow strip is a favorite haddock-ground, and is much resorted to by the small boat fishermen of the vicinity, and also by others from Eastport and Lubec, Maine. *The depths vary from eighteen to thirty-four fathoms*, and the bottom is somewhat broken and irregular.

Small haddock-grounds also exist close inshore to the westward of the northern end of Grand Manan. The outer edge lies about half a mile off shore, the length of the ground being about two miles and the depth of water from fifteen to forty fathoms.

THE MUD is a broad area of muddy bottom, forming the channel to the eastward of Campobello Island, beginning in the north to the westward of the Wolves and extending southward to between West Quoddy Head and Grand Manan. The western edge of this ground lies about two miles off Campobello, and its width averages about three and a half miles. The depths vary from thirty-nine to sixty fathoms, the bottom consisting of soft mud. This is the best ground for hake in this vicinity, and is resorted to by small vessels and open boats from Western New Brunswick and Eastern Maine.

POLLOCK GROUNDS.—Two pollock grounds occur in this vicinity, both lying to the westward of the northern part of Campobello Island. One lies just to the eastward of, and very near to, Indian Island, and is formed of strong tidal eddies. Another lies at the mouth of the channel between Campobello and Casco Bay Island, being close to the eastern shore of the latter island, and likewise is an area of strong tidal eddies. Both of these grounds are of limited extent and of less importance now than formerly, but they are still much resorted to by the small boats of the vicinity.

TEMPERATURES IN THE BAY OF FUNDY.—The following observations, made during August, 1872, by the United States Fish Commission, will serve to indicate the summer temperatures of the surface and bottom waters at the mouth of the Bay of Fundy. They are too few in number, however, and extend over too short a period, to be of much value in making comparisons with the temperatures of other regions which have been more fully worked up.

The surface temperature to the east of Grand Manan, at distances varying from two and a half to ten miles from the island, during August 23 and 24, 1872, ranged from 48° F. to 53° F.

Within the same area the bottom temperatures, taken at the same time, were as follows: Two miles from the island, depth twenty-nine fathoms, 44° F.; two and one-half miles from the island, depth twenty-eight to fifty-two fathoms, 39¼° F.; eight to ten miles from the island, depth from ninety to one hundred and five fathoms, 37¾° F. to 38° F.

To the westward of Grand Manan, at distances of three to six miles from land, the surface temperatures on August 28, 1872, ranged from 47° F. to 48° F. The bottom temperatures of the same area, at depths of forty to fifty-five fathoms, varied from 40° F. to 45° F.

Just east of Campobello Island, on the fishing-ground called the "Mud," the surface temperatures from August 2 to 16, 1872, varied from 48½° F. to 57½° F. The bottom temperature at twenty-five fathoms was 47° F.; at sixty fathoms 43° F.; at eighty fathoms 39¾° F.

In Passamaquoddy Bay, between Deer Island and the coast of Maine, in depths of water ranging from thirty to seventy fathoms, the surface temperature was 48° F., and the bottom temperatures from 45° F. to 46° F.

6. THE COAST OF MAINE.

GENERAL ACCOUNT.—Within the limits of the sixty-fathom line, which lies at an average distance of twelve to fifteen miles from the coast, there occur a very large number of rocky or gravelly patches, which are the favorite resorts for cod, haddock, and pollock, while on the muddy bottoms between hake are generally found in greater or less abundance during the summer. In addition to these grounds, of which special descriptions are given on the following pages, there are many other banks, mostly of small size, situated in the bays and among the numerous islands dotting the coast line, on which the different species of the cod family can be taken. These banks, with the intervening valleys, form a more or less continuous and rich fishing-ground, bordering the entire coast of Maine. During a part of the summer, when the dogfish have driven away nearly all of the fish from the outer grounds lying off the coast, good fishing can generally be obtained near land. Herring and mackerel are also very abundant in their season along the entire coast. The former species is caught in large numbers in weirs and gill-nets, placed for their capture around the outer islands and in the numerous bays and harbors which indent the coast. From June to November immense quantities of mackerel visit the coast of Maine; they are often so abundant as to enter the bays, large schools being met with some distance inside of the coast line, as far inland, in fact, as the saltness of the water will permit. The deeper water off this coast is, however, better suited to their capture, as described elsewhere.

Lobsters are more abundant on the coast of Maine than elsewhere within the territory of the United States. In some localities they are captured throughout the year, and doubtless the season might be as continuous nearly everywhere were the demands sufficient to warrant their being taken at all times. In the summer they enter all the bays and estuaries, and some generally ascend as far as the water is sufficiently salt for them.

The soft clam (*Mya arenaria*) also abounds on the shores of the Maine coast. It is extensively used as food and as bait for cod and other fish. Large quantities are salted annually to sell as bait to the bank fleet.

On the following pages, brief descriptions are given of the principal inshore fishing-banks, the majority of which lie within the sixty-fathom line. Some of those lying just without this limit, in part or wholly, are, however, also included here, as belonging to the same series of grounds, and as being visited by the same class of fishing boats. This list, although it cannot be considered as complete, probably contains nearly all the fishing-grounds of any size that can be distinctively marked off from the general fishing area of the coast.

GROUNDS OFF MOOS-A-BEC LIGHT.

LUKE'S ROCK bears south by east from Moos-a-bec light; distance, three miles. It is nearly circular in outline, about one mile in diameter, with depths of twenty-five to thirty-five fathoms, and a bottom of rocks, gravel, and mud. Hake, cod, and pollock, together with a few haddock, are taken on this rock by the small-boat fishermen.

NEWFOUND GROUND.—This is a small rocky spot, not more than one-fourth of a mile in diameter, having in the center an automatic buoy, placed there by the Government as a guide to vessels bound to or from the Bay of Fundy. It bears south by west from Moos-a-bec light-house, from which the buoy is distant about three miles. The depth is eighteen fathoms. This ground is resorted to by a few small-boat fishermen, using hand-lines.

HENRY'S ROCK lies five miles southwest by south from Moos-a-bec light-house. It is one-fourth of a mile in diameter, with a depth of thirty fathoms, the bottom being quite level. It is resorted to by small boats, hand-lines only being used.

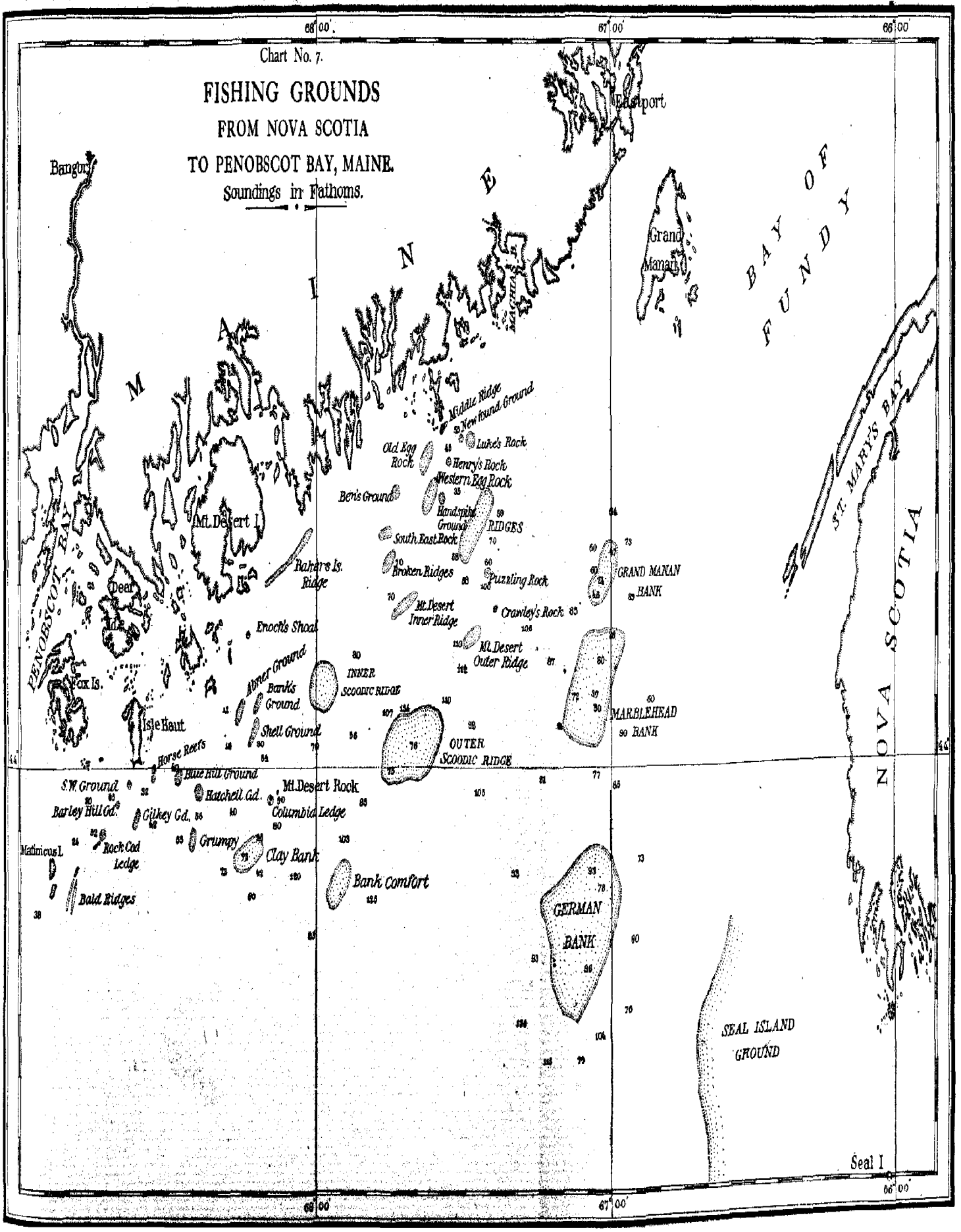


Chart No. 7.
FISHING GROUNDS
FROM NOVA SCOTIA
TO PENOBSCOT BAY, MAINE.
Soundings in Fathoms.
68° 00'
67° 00'
66° 00'
Eastport
Bangor
Grand Manan I.
BAY OF FUNDY
GULF OF MAINE
NOVA SCOTIA
ST. MARY'S BAY
PENOBSCOT BAY
Mt. Desert I.
Deer Isle
Fox Is.
Isle Haut
Matinicus I.
Baker's Is.
Ridge
Enoch's Shoal
Abner Ground
Banks Ground
Shell Ground
Horse Reefs
Blue Hill Ground
S.W. Ground
Barley Hill Gd.
Hatchell Gd.
Gilkey Gd.
Grumpy
Rock Cod Ledge
Bald Ridges
Mt. Desert Rock
Columbia Ledge
Clay Bank
Bank Comfort
Middle Ridge
Newfound Ground
Luke's Rock
Old Egg Rock
Henry's Rock
Western Egg Rock
Ben's Ground
Handspike Ground
RIDGES
South East Rock
Broken Ridges
Puzzling Rock
Mt. Desert Inner Ridge
Crawley's Rock
Mt. Desert Outer Ridge
INNER SCOODIC RIDGE
OUTER SCOODIC RIDGE
GRAND MANAN BANK
MARBLEHEAD BANK
GERMAN BANK
SEAL ISLAND GROUND
Seal I.

HANDSPIKE GROUND.—This is a small rocky shoal, lying eight miles southwest by south from Moos-a-bec light-house. It is nearly circular in outline, about half a mile in diameter, and with depths of thirty-five to forty fathoms.

WESTERN EGG ROCK lies eight miles southwest from Moos-a-bec light-house. Its length, in a northeast and southwest direction, is three miles and its breadth one mile. The depths range from twenty to thirty-five fathoms, and the bottom is irregular, sharp, and rocky, being too rough for trawls; hand-lines are, therefore, almost wholly used by the boat-fishermen, who resort to it in summer for cod and pollock.

OLD EGG ROCK bears west southwest from Moos-a-bec light-house; distance, six miles. It extends three miles in a southwest and northeast direction, and is one mile wide. The bottom is rocky, with depths ranging from twenty-five to thirty-five fathoms. It is principally resorted to by small boats in pursuit of cod and pollock, which are mainly taken with hand-lines, though trawls are occasionally used.

MIDDLE RIDGE lies three miles west by south from Moos-a-bec light-house, and extends one mile northeast and southwest, the width being one-half mile. The depth varies from eighteen to twenty-five fathoms, the bottom being rocky and rough. It is occasionally resorted to by small-boat fishermen, using hand-lines only, but only a few fish are taken.

BROKEN GROUND is a large piece of broken bottom, the eastern end of which bears south by east fifteen miles from Moos a-bec light, whence the ground extends west-southwest to within four miles of Mount Desert Rock; its average width is about one mile. The depths vary from fifteen to one hundred fathoms, the shoaler portions being sharp and rocky, and the deep places consisting of clay and gravel. Some of the spots are half a mile long, and others from one to three miles in diameter, with an average depth of seventy fathoms. Cod are taken on the outside of the grounds, pollock and small cod on the shoals, and hake on the inside. By some this is considered the best fishing-ground on the coast. Several of the spots have special names, as "Crawley's Rock," "Puzzling Rock," "Lenke's Rock," and "The Ridges." Fishing continues four months—from June 1 to September 30. Herring are abundant here in their season and are used in large quantities for bait.

The *Ridges*, which form a part of the "Broken Ground," bear south from Moos-a-bec: distance to the center, nine miles. They are seven miles long, southwest and northeast; two miles wide, and have a depth of from thirty to thirty-five fathoms. The bottom consists of rocks and gravel, on which cod and pollock are abundant.

Crawley's Rock bears south seventeen miles from Moos-a-bec light, and has a shoal of about fifteen acres in extent, with a depth of fifteen fathoms and a bottom of sharp rocks.

Puzzling Rock bears south fourteen miles from Moos-a-bec light, and has a shoal about half a mile in diameter, on which the depth of water is fifteen fathoms, and the bottom sharp and rocky.

GROUNDS OFF PETIT MANAN.

TIBBETT'S LEDGE bears about east from Petit Manan; distance, four to five miles. (Marks: Schoodic Island, over the green island of Petit Manan, and the Ladle, over Nash's Island.) This ledge consists of two rocky shoals, with a depth of three to three and a half fathoms. The shoals are only about one acre in extent and a quarter of a mile apart, bearing northwest and southeast from each other. To the westward of these shoals the ground is broken nearly to Petit Manan, and this section is a favorite resort for small boats. To the eastward, however, the ledge drops off suddenly into mud. In May, large cod are caught over the muddy bottom, just to the eastward

of the ledge, in a depth of twenty-seven to thirty-four fathoms. In the spring of 1880, three men, with hand-lines, caught three hundred cod here in a single day.

BEN'S GROUND bears east-southeast from Petit Manan; distance, four to five miles. (Marks: Petit Manan light, to the northward of the high or middle hill of Mount Desert, and Humpback Mountain, on the west side of Trafton's Island, or Pond Island light-house, to the eastward of Jordan's Delight.) This ground is circular in shape, with a diameter of about three-fourths of a mile, and has a very irregular bottom of rocks and mud. The depths range from fourteen to thirty fathoms. This ground is at present of but little importance, but is occasionally visited by the boat-fishermen in summer for cod and haddock; on muddy bottom, in the immediate vicinity, hake grounds occur.

SOUTHEAST ROCK.—This is a ledge which becomes nearly uncovered at low water on its shoalest part. It bears south-southeast from Petit Manan; distance, four and one-half miles. From the shoaler portion of the ledge the bottom slopes off towards the northeast a distance of four miles, with an irregular bottom, the depth increasing from seventeen to thirty fathoms. The shoal portions are rocky, while the deeper places between are generally muddy. Cod and haddock are taken on this ground by the boat fishermen in May and June, but from July to September hake are the most common fish.

BROKEN RIDGES, "JOE RAY GROUND."—This ground bears south-southeast from Petit Manan, from which the center is seven miles distant. It is two miles long in a southwest and northeast direction, and one mile wide, the depths ranging from twenty-seven to thirty-three fathoms. The bottom is very uneven, and consists of rocks and mud. The shoalest part of the ground is near the center. The depths vary so greatly over short distances that a boat at anchor, swinging with the tide, may find a difference in depth of from five to six fathoms. This ground is considered very good for cod and haddock. It is resorted to by small vessels in the spring and by open boats during the summer.

BLACK LEDGES GROUND.—This is an excellent fishing-ground for haddock, situated between "*Jordan's Delight*" and the "Halibut" or "*Black Ledges.*" *The fish strike in very plentifully* in summer, probably in pursuit of herring. One day, in the first part of July, 1879, three persons in one boat, with a trawl of seven hundred hooks, took eleven hundred haddock by under-running *on this ground, and more than five thousand haddock were probably taken there that day by* all of the small boats fishing there. The haddock do not usually remain long.

GROUNDS OFF MOUNT DESERT ISLAND.

BAKER'S ISLAND RIDGE.—This is a narrow ridge making out from Baker's Island in an east by north direction. The eastern part bears south by east from Schoodic Island, from which it is distant *three-fourths of a mile. The ridge is much broken, with an average width of one-half* mile, and depths varying from twenty to twenty-five fathoms. The bottom is rocky in some places and gravelly in others. As a rule, but little fishing is done on the shoaler portions of the ridge, but where the bottom slopes off to depths of thirty to thirty-five fathoms, with a bottom of mud, hake are generally quite abundant from July to October inclusive. During that season the ground is resorted to by small vessels and open boats.

MARTIN'S GROUND.—The center of this ground bears west-southwest from Schoodic Point, from which it is distant about three miles. It is a rocky patch, with depths of fifteen to twenty-five fathoms. Its extent does not exceed four or five acres. This is not an important fishing-ground, but is sometimes resorted to by the boat-fishermen in the fall, when a limited amount of cod are taken with hand-lines.

EGG ROCK BROKEN GROUND.—This is a rocky ridge which makes out in a south by west direction from Egg Rock ledges a distance of about two miles, and has a width of about half a mile. The bottom is irregular, and the depth of water ranges from nine to fifteen fathoms. This ridge, together with Martin's and Seavey's Grounds, divide the western or Baker's Island mud channel from the Schoodic mud channel, both of which are good hake grounds, with depths varying from thirty to forty fathoms. The bottom consists of mud. Mr. Nathan Hammond, of Winter Harbor, Gouldsborough, Maine, states that from 1830 to 1840 thirty to forty vessels were frequently seen at anchor in Baker's Island Channel at one time, all of them being engaged in catching hake. These fish are much less abundant now upon these grounds than formerly, but nevertheless they are more or less resorted to at present by open boats and vessels during the summer, and large catches are still taken by the local fishermen.

INNER SCHOODIC RIDGE bears southeast by south from Baker's Island, from which the center of the ground is twelve miles distant. It is nearly circular in shape, with a diameter of about four miles, the depths ranging from eighteen to sixty fathoms. The bottom is composed of rocks, gravel, and mud; the shoaler portions are sharp and rocky.

OUTER SCHOODIC RIDGE.—The northwest part of this ridge bears southeast from Baker's Island, from which it is distant twenty-two miles. It is about eight miles long in a southwest and northeast direction, being nearly parallel with the neighboring coast. In the widest part its breadth is about six miles. The bottom, which is composed of rocks and gravel in the shoaler parts and of mud in the deeper portions, is quite broken and irregular, the depths of water varying from twenty-two to eighty fathoms. This ridge lies seven miles outside of the Inner Schoodic Ridge, and is considered one of the best shore fishing-grounds on the coast of Maine.

MOUNT DESERT INNER RIDGE.—The center of this ground bears southeast one-quarter east from Schoodic Island, about fifteen miles distant. It extends four miles in a west by south and east by north direction, and has a width of half a mile, the depths ranging from thirty to forty-five fathoms. On the shoaler parts the bottom is rocky, but elsewhere it consists of sand and gravel. It is considered a good fishing-ground for several species of the cod family during April, at which time both trawls and hand-lines are used.

MOUNT DESERT OUTER RIDGE bears southeast by east from the big hill of Mount Desert Island. The distance from Schoodic Island to the center of this ground is twenty-five miles. It is two miles long, east by north and west by south, and about three-fourths of a mile wide. The depths vary from forty-five to sixty fathoms. On the shoal part the bottom is rocky, but toward the sides sand and clay predominate. Although of small size, this is considered a good fishing-ground for cod, etc., from April to July. Fishing is done principally with trawls.

ENOCH'S SHOAL bears east-northeast from Great Duck Island; distance, three miles. This is a small hummock on the outer part of a ridge that extends out to it from Big Duck Island. It has a sharp, rocky bottom, and an average depth of eighteen fathoms.

BANK'S GROUND.—The center bears southeast by south from Great Duck Island, from which it is distant five miles. This is a small patch of ground, about one and one-half miles long, in a southwest and northeast direction, by one-fourth of a mile wide, and has depths varying from thirty-five to fifty fathoms; the bottom is muddy. It is principally resorted to by the small-boat hake fishermen.

SHELL GROUND bears southeast from Long Island Head, from which the center of the ground is distant about six miles. It extends two miles in a southwest and northeast direction, and is about half a mile wide. It has a shoal of twenty-five fathoms in the middle portion, the bottom of which is composed of sharp rocks. On all sides of this shoal the bottom is quite

irregular, consisting of pebbles and mud. The greatest depth near the edge of the bank is about fifty fathoms. This ground is especially good for haddock in July and August, during which months it is resorted to by the small boats of the region, the fishing being carried on principally by means of trawls.

ABNER GROUND bears south-southeast from *Gott's* Island; distance, eight miles. It extends one and one-half miles in a northeast and southwest direction, and is one-fourth of a mile wide. The bottom, which is composed of rocks and mud, is broken, the depth of water ranging from twenty-five to fifty fathoms. This is a good haddock ground in July and August, and is visited by the same class of fishermen that resort to "*Shell* Ground" and other similar places in that vicinity.

GROUNDS OFF ISLE *AU* HAUTE.

GRUMPY.—The Grumpy bears southeast from the western head of Isle au Haute; distance, ten miles. This ground is two and one-half miles long, northeast and southwest, by three-fourths of a mile wide, and has a small shoal of fifteen fathoms on the northeast part. The general depth varies from thirty-five to forty fathoms, the bottom being gravelly. It is considered one of the best inshore grounds for cod the entire year, for haddock in the winter, and hake, just off the edge, in the summer. Both trawls and hand-lines are used.

HATCHELL GROUND bears southeast by east three-quarters east, about nine and one-half miles, from the western head of Isle au Haute, the marks being as follows: Eastern Mount Desert Hill in the middle saddle of Long Island, and Little Spoon Island in the great or center saddle of Isle au Haute. This ground is but little more than a mile in diameter, and is said to have a shoal of fifteen fathoms, which is so small, however, as to be difficult to find. The general depth varies from twenty-five to forty fathoms, the shoalest part being in the middle of the ground, whence the bottom slopes off gradually on all sides. The character of the bottom is sharp and rocky on the shoal, but gravelly and pebbly toward the sides; at the edge of the ground the bottom consists of soft mud. Various low forms of animal life, the most of which serve as food for fishes, are constantly brought up on the hooks of the trawlers. This ground, next to the "Grumpy," is considered the best one inside of Mount Desert Rock; cod and a few pollock are caught here in the spring; hake are taken on the mud near the edge of the ground in summer, and haddock are abundant in winter. Both hand-lines and trawls are used.

BLUE HILL GROUND bears east by south three-quarters south (approximate) from the western head of Isle au Haute; distance, about seven miles. The marks for determining the locality of this ground are as follows: Brimstone Island, out by the western head of Isle au Haute, and Blue Hill, on the west side of Marshall's Island. These marks lead to a depth of twenty-five fathoms on the northeast part of the ground, from which the bottom drops off gradually to the southwest, in which direction a depth of forty fathoms is reached a mile from the shoaler portion, which is about half a mile wide. The bottom consists of gravel and pebbles. This is a good locality for cod during the spring and fall, but is best for haddock during the entire winter. Both trawls and hand-lines are used.

INNER HOUSE REEF bears southeast three-quarters east, one and a half miles, from the eastern ear of Isle au Haute. It contains a shoal of twenty-five fathoms about one-eighth of a mile in diameter. From this shoal the water gradually deepens toward the northeast for a distance of a half mile, when it drops off into mud. The depth of the northeast portion is about thirty-five fathoms. The bottom consists of pebbles and gravel. This is a good ground for cod in the spring and fall, and for hake, close to the edge, in the summer. Trawls and hand-lines are used.

Chart No. 8.

FISHING GROUNDS

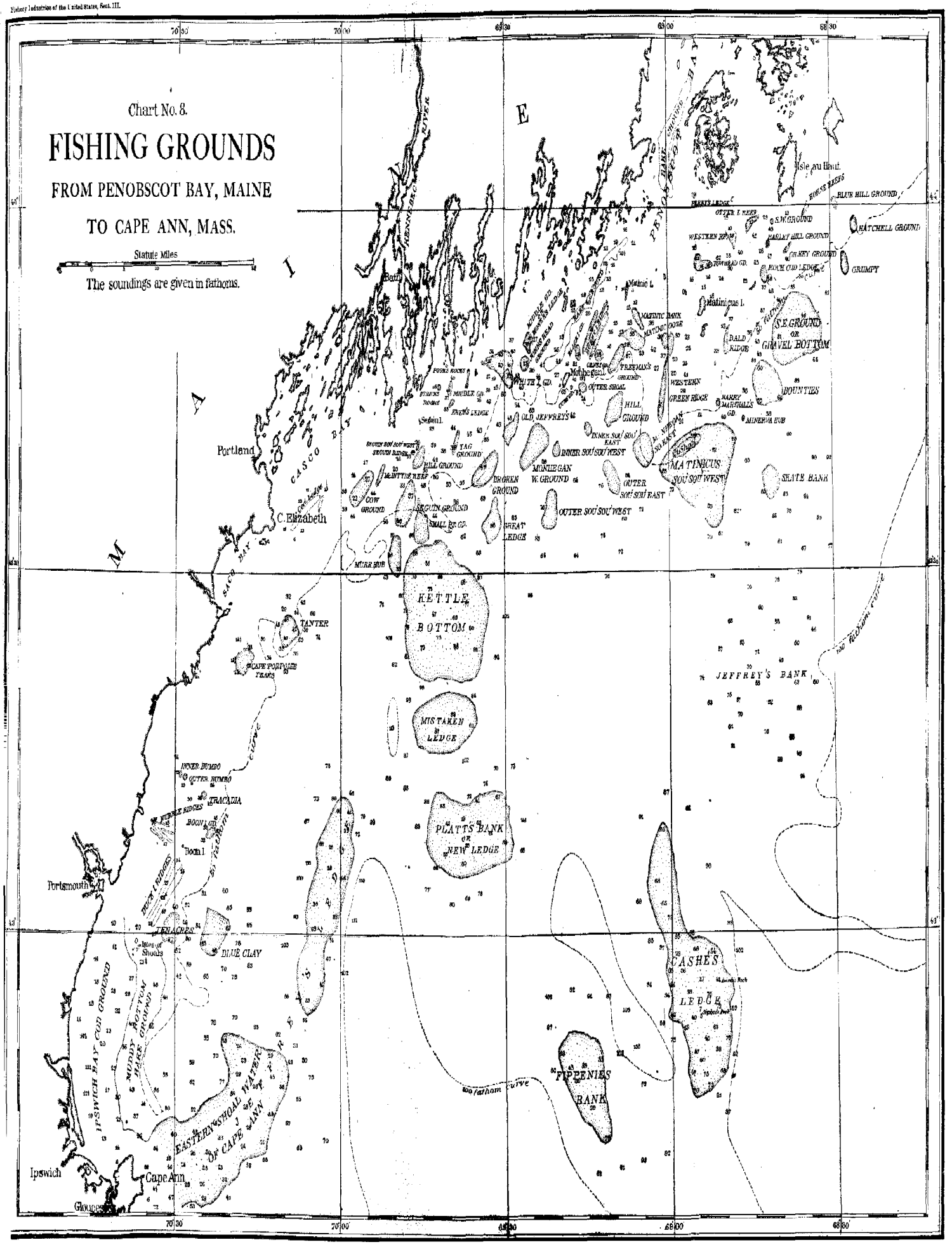
FROM PENOBSCOT BAY, MAINE

TO CAPE ANN, MASS.

Statute Miles

0 5 10 20

The soundings are given in fathoms.



OUTER HORSE REEF lies but a short distance to the southwest of the Inner Horse Reef, there being only a narrow gully between the two. The shoal, which is small, and falls off rapidly on all sides, has a depth of thirty fathoms. Over a space a quarter of a mile in diameter the bottom is gravelly. This ground is resorted to for the same fish, and at the same seasons, as the inner ridge.

SOUTHWEST GROUND lies two miles southwest from the western head of Isle au Haute; is circular in shape, one-half mile in diameter, and has a gravelly bottom, with depths of from thirty-five to forty fathoms. This is a good locality for large cod from April to June and from September to November. A few haddock and pollock are taken with the cod. Hand-lines are principally used, with clam and herring bait.

BARLEY HILL GROUND bears north-northeast from Seal Island and south-southwest from the western head of Isle au Haute, being directly in a line between the two, and very nearly equidistant from each, the distance being three and one-half miles. This is a small ground, not over half a mile in diameter, circular in shape, with depths of from twenty-eight to thirty fathoms, and with a mixed bottom of rocks and mud. It is a good fishing-ground for cod in the fall and spring, and a few halibut are also occasionally taken upon it. Both trawls and hand-lines are used.

GILKEY GROUND bears south from the western head of Isle au Haute; distance, four miles. It extends in an east-northeast and west-southwest direction, and is about one and one-half miles long by one-third of a mile wide. It has a rocky bottom on the shoaler portion, where the depth is twenty-three fathoms, but it slopes off gradually to a depth of thirty-five fathoms on the southwest part, where the bottom is gravelly. The bottom is comparatively smooth, and both trawls and hand-lines are used upon it. This is a good ground for cod during the spring and fall, for haddock during the winter, and for hake, near the edge, in the summer.

ROCK-COD LEDGE.—This ledge lies about one mile northeast of Seal Island (off Isle au Haute), and has a depth of only three and one-half fathoms on the shoalest part. On all sides it slopes off gradually for quite a distance. The bottom consists of sharp rocks, and is broken in places. This is a very fair ground for rock-cod during the spring and fall, and has always been considered an excellent locality for hooking mackerel when these fish are in this vicinity.

SOUTHEAST GROUND AND GRAVEL BOTTOM.—This is an extensive piece of flat ground lying to the southward of Seal Island, the western part bearing a little east of south, and the eastern part about east-southeast from the island. It is five or six miles in diameter, and although forming a single stretch of ground, the eastern portion has received the name of Southeast Ground, while the western part is called the Gravel Bottom. The latter name is derived from the character of the bottom, which is pebbly and gravelly on the western part, and muddy, with patches of gravel, on the eastern part. The western portion has depths of from thirty-five to forty-five fathoms, while the eastern part varies in depth from forty to sixty fathoms. This is a good ground for cod in the spring, for hake in the summer, and for haddock in the winter. Fishing is done mostly with trawls.

LAISDELL'S GROUND.—This is a small rocky spot outside of the Brandy Ledges, and is not more than a fourth of an acre in extent. It has a depth of twenty fathoms, with a sharp, rocky bottom. It is considered the best fishing-ground for cod and haddock in Isle au Haute Bay.

SADDLE-BACK REEF bears about south from Saddle-Back Ledge, from which the inner part is distant three-fourths of a mile. It is two-thirds of a mile long, north and south, and quite narrow, being not more than one-fourth of a mile in width. The depths vary from fifteen

to thirty-five fathoms, and the bottom is broken and rocky. Cod are caught during May and June with hand-lines.

OTTER ISLAND REEF, SNIPPER SHIN, and WESTERN REEF.—These names are applied to different sections of an irregular, broken piece of rocky ground, that lies about half way between Vinal Haven and Seal Island. Otter Island Reef, by which name the eastern section is known, lies about four miles west by south one-quarter south from the western head of Isle au Haute, and has depths of from ten to twenty-five fathoms, with a rocky and broken bottom, on which trawls can seldom be used. It is a favorite ground for cod and haddock during all the seasons when these fish are in shoal water, but is best for cod in the spring and for haddock in the fall. Snipper Shin is only a westerly continuation of the Otter Island Reef, and lies between it and the Western Reef. The general direction of this ground is about northwest until it joins the Western Reef, which trends more to the southwest. It contains a shoal of seven fathoms, about which the water is twenty-five fathoms deep in places. The general characteristics of the ground are similar to those of Otter Island Reef, but small halibut are occasionally taken in addition to cod and haddock. The Western Reef has the same depth and character of bottom as the other two pieces of ground.

GROUNDS OFF AND ABOUT MATINICUS ISLAND.

BALD RIDGES.—These ridges begin just outside of Wooden Ball Island, and run off in a nearly direct line for Matinicus Rock. They are almost parallel with one another, and quite close together, the distance between them not being over half a mile. They are from a fourth of a mile to half a mile in width each, and have depths of from fifteen to thirty fathoms, with a broken, rocky bottom. The shoalest part is distant about a mile from Wooden Ball Island, and from there the depth increases toward the southern end. This is a good ground for cod at all seasons when they are on the coast, the shoal being a favorite resort of the rock-cod.

HARRY MARSHALL'S GROUND bears south by west from Matinicus Rock, distance, about three miles, and has an area of not more than two acres. The shoaler portion has a depth of thirty-five fathoms, with gravelly bottom; on the edge the depth is forty-five fathoms, and the bottom consists of rocks and mud. A good ground for cod in spring and for hake in summer.

THE BOUNTIES bears southeast by south half-south, distant six miles, from Wooden Ball Island. It is about four miles in diameter, and nearly circular in shape, with depths of forty to sixty fathoms. The bottom consists of gravel and rocks, and is somewhat broken. It is a good ground for cod and cusk in the spring and fall and for haddock in the winter.

MINERVA HUB.—This is a small gravelly spot, not more than a fourth of a mile in diameter, with a depth of thirty-five fathoms, and abounds in cod during the spring and fall. It bears south-southeast from Matinicus Rock; distance, nearly six miles.

SKATE BANK bears south-southeast, distant twelve miles, from Matinicus Rock; is about two miles in diameter, and nearly circular in shape, with depths of thirty-five to sixty fathoms. The bottom is gravelly, but quite uneven. The best season for fishing on this ground for cod and cusk is from April to July.

MATINICUS SOU'-SOU'WEST GROUND.—This ground bears south-southwest from Matinicus Rock, from which the inner edge is distant about six miles. It extends about nine miles north and south, and has about the same width, being nearly triangular in shape, and broadest at the northern end. On the northern part there is a shoal of about thirty fathoms, two miles long east and west, and one mile wide. Sharp rocks cover the shoal, but the ground is not broken and drops off gradually to depths of fifty and fifty-five fathoms, and even to sixty fathoms on the

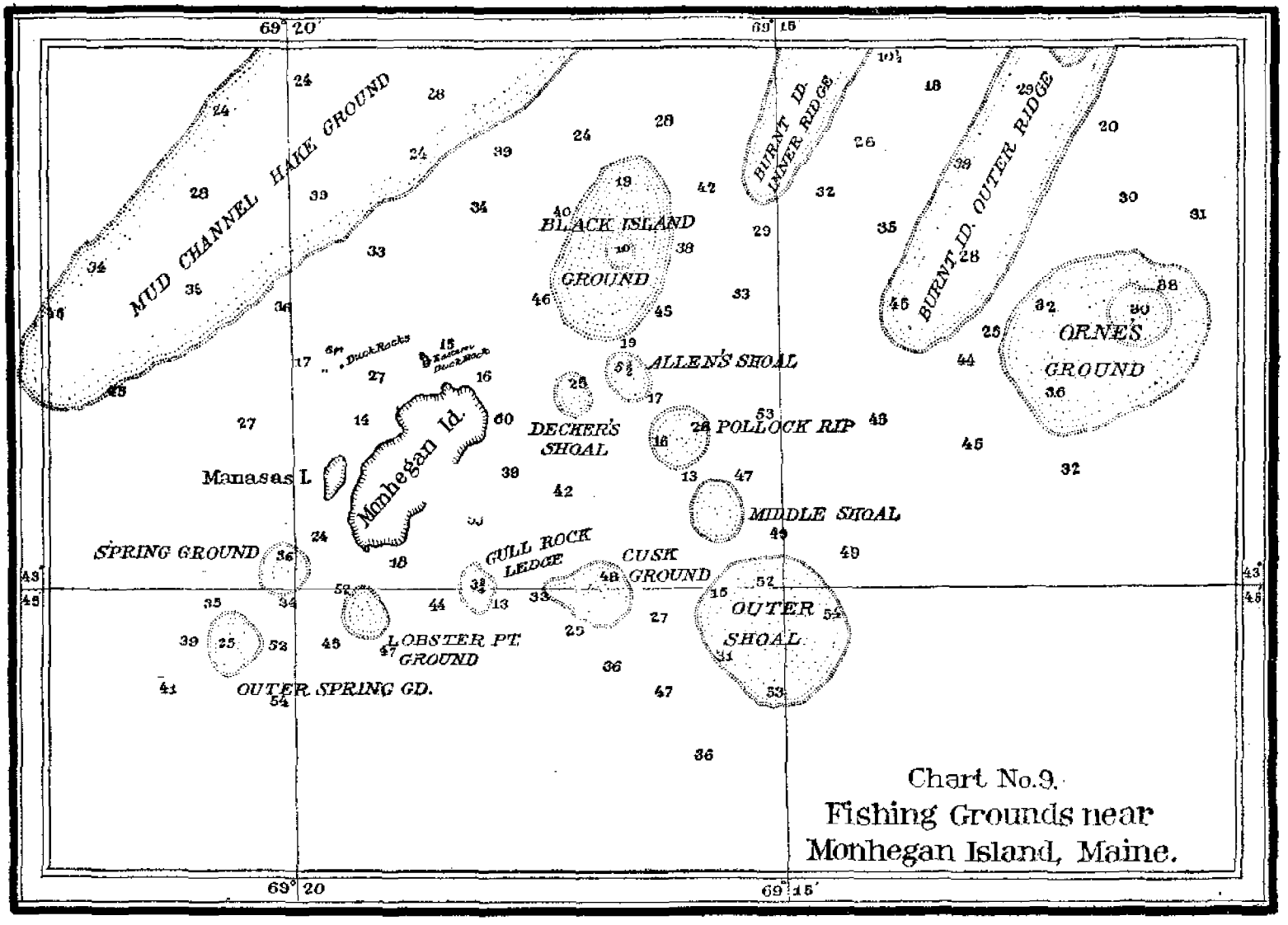


Chart No. 9.

Fishing Grounds near Monhegan Island, Maine.

southern part. Outside of the shoal the bottom is pebbly and gravelly. This is one of the best fishing-grounds for cod and haddock in this vicinity. Both trawls and hand-lines are used.

INNER BREAKER lies two miles west of the southwest point of Matinicus Island, and is a rocky shoal about an acre in extent, with seven fathoms of water. From the shoal the ground slopes gradually to depths of twenty-five and thirty fathoms, and this slope offers good fishing for cod in May and June. The bottom is rocky and much broken, being too sharp for trawls.

TOW-HEAD GROUND bears north by east one-half east from Matinicus Island, from which it is distant two and one-half miles. It has a depth of from twelve to thirty fathoms; is somewhat irregular in shape, with a very rocky and broken bottom. The ground designated by this name is from two and one-half to three miles long, and from one-half to one and one-half miles wide. It extends in an east by south and west by north direction, and is considered one of the best inside shoal grounds for cod and haddock in the bay. Hand-lines only are used.

The entire bay, between Vinal Haven and Matinicus and the Green Islands, is full of broken, rocky patches of fishing-ground, certain portions of which have received local names from the fishermen of the vicinity.

WESTERN or GREEN ISLAND RIDGE.—*The northern portion of this ridge lies six and one-half* miles northwest by west from Matinicus Rock, from which place it extends about seven miles in a south-southwest direction. Its greatest width is not over one mile; the depths vary from fifteen to thirty fathoms, the bottom being broken and rocky. This is a good ground for cod in the spring and fall.

GROUNDS OFF MATINIC ISLAND.

MATINIC BANK is an extension of the shore soundings which make out to the southward and eastward of Matinic, a distance of two or three miles, with depths, outside of one and a half miles, of twenty-three to thirty fathoms. The bottom is quite level, consisting of rocks, pebbles, and gravel, and abounds in cod from March until June. Just off the edge the bottom is soft and muddy, with depths of forty to fifty fathoms.

MATINIC OOZE.—This is a flat bottom composed of ooze and shells that makes off to the eastward of the Haddock Ledge and Shoal, and bears about south from Matinic. Haddock Shoal and the Ooze are really parts of one ground, though known to the fishermen under different names. The Haddock Shoal is now considered poor ground and is little resorted to. The Ooze falls off gradually, reaching a depth of fifty fathoms on the outer part. It is considered fair fishing-ground for cod and haddock in the spring, and for cod and hake in the summer and fall.

FREEMAN'S GROUND lies about six and one-half miles east from Monhegan Island, between Orne's Ground and Matinicus Western Ground. It is about three miles long, in a northeast and southwest direction, and one mile wide. It includes a shoal of twenty fathoms on the southwest part, having a sharp, rocky bottom, the rest of the ground being from twenty-five to forty fathoms deep, with a bottom of rocks, gravel, and broken shells, quite uneven in some places and smooth in others. This is a good ground for cod in the spring and for hake, cod, and pollock in the summer and fall.

GROUNDS IN THE IMMEDIATE VICINITY OF MONHEGAN ISLAND.

MIDDLE SHOAL, POLLOCK RIP, ALLEN'S SHOAL, and DECKER'S SHOAL are small rocky patches lying to the eastward of Monhegan and northerly from the Outer Shoal. They have depths varying from six to thirty fathoms, and generally a sharp, rocky, and broken bottom. They are fished on with hand-lines for cod and pollock.

Another lot of small patches lie westerly from the Outer Shoal and close to Monhegan Island. These are, the Cusk Ground, with depths of from twenty to thirty-five fathoms; Gull Rock Ledge, a shoal of three and three-fourths fathoms; Lobster Point Ground, with depths of fifteen to thirty fathoms; Inner Spring Ground, fifteen to thirty fathoms; and Outer Spring Ground, twenty-five to thirty-five fathoms. All of these are fished on for cod, haddock, and pollock by small boats, principally in the early spring and late fall. Not much distinction can be made between these grounds, as a boat may fish on several of them in the course of a single day. The Spring Grounds, however, are so near the harbor that they are generally the first visited in the spring; hence the name.

GROUNDS NORTH, NORTHEAST, AND EAST OF MONHEGAN ISLAND.

HAKE GROUND OR MUD CHANNEL.—This is a soft, muddy channel, extending from just outside of White Head to abreast of Monhegan Island, on the northern side. The depth varies from twenty to forty-five fathoms, and it was formerly one of the best hake grounds along the shore. It is now of less importance.

BLACK ISLAND GROUND bears east-northeast from Monhegan Island, from which the inner edge is distant about one mile. It is about one mile in diameter, and has a small shoal of ten fathoms, with a sharp, rocky bottom in the center. From this shoal the depth increases gradually to the edge of the ground, where it reaches forty fathoms. Beyond the depth of twenty-eight to thirty fathoms the bottom is gravelly and smoother. Monhegan Island boats fish on this ground all the season, from spring until fall, cod being caught in the spring, pollock on the shoal in the summer, and cod and hake on the edge in summer and fall.

BURNT ISLAND INNER RIDGE bears northeast by east from Monhegan Island, from which the inner edge is distant about three miles. This is a broken piece of ground, with depths varying from fifteen to twenty fathoms, the bottom being generally rocky and gravelly, with occasional mud holes. It extends in a northeast direction about four miles, reaching nearly to the Roaring Bull Ledge, and is about half a mile wide. Cod are taken here in the spring, from April to June, and cod and hake in the fall, from September to November.

BURNT ISLAND OUTER RIDGE.—This runs parallel with the Inner Ridge, at a distance from it of about three-fourths of a mile. It has depths varying from five to twenty-five fathoms, the bottom being somewhat less broken than on the Inner Ridge. This ground is fished on for the same species as are taken on the Inner Ridge.

ORNE'S GROUND bears east, distant four and one-half miles, from Monhegan light to the center. It is about a mile and a half long, east and west, and about a mile wide, with depths varying from thirty to forty-five fathoms. On the shoal part the bottom consists of sharp rocks and is broken, but on other portions of the ground it is gravelly and pebbly and quite level. The shoal lies toward the eastern part of the ground. This is a good locality for cod.

GROUNDS SOUTHEAST OF MONHEGAN ISLAND.

OUTER SHOAL lies about three miles southeast from Monhegan light-house. It is circular in shape, one and one-half miles in diameter, and has depths ranging from ten to thirty-eight fathoms. A small rocky shoal of ten fathoms is located near the center of the ground, the remainder having a gravelly bottom. Cod occur here from spring until fall, and the shoal is also a good locality for pollock.

MONHEGAN INNER SOU'-SOUTHEAST GROUND.—This shoal bears south-southeast from Monhegan light-house, from which the center is distant about five miles. It is nearly circular in

shape, and about a mile and a quarter in diameter. It has depths of thirty to fifty fathoms and is shoalest on the eastern part. This shoal is broken and rocky, but on the other parts of the ground the bottom is gravelly, with spots of mud. Cod and cusk are the principal fish taken here, although a few haddock, pollock, and hake are also caught. June is considered the best month on this ground for small boats, which usually fish until they are driven away by dogfish.

MONHEGAN OUTER SOU'-SOUTHEAST GROUND is about three miles outside of the Inner Sou'-Southeast, on the same bearing, and is similar in size and shape to the Outer Sou'-Sou'-west Ground. The bottom is rocky and muddy, or composed of hard clay, and the depths range from thirty-five to fifty-five fathoms. This ground is resorted to by the same kinds of fish that are caught on the inner shoal.

MONHEGAN SOUTHEAST GROUND bears southeast from Monhegan Island, from which the center is distant twelve miles. It is nearly three miles in diameter, and circular in shape, but the bottom is so broken, the depths within very short distances varying from thirty-five to seventy-five fathoms, that it is somewhat difficult to find. The bottom consists of rocks, gravel, and mud. This is considered a good locality for cod from April to July; both trawls and hand-lines are used.

HILL GROUND bears nearly south-southwest nine miles from Matinic, and is between three and four miles long, southwest and northeast, and about two miles wide. The shoalest portion has a depth of thirty-five fathoms, with rocky bottom; but from here it slopes off gradually to a depth of fifty fathoms, with a mixed bottom of gravel, rocks, and mud. The best fishing it offers is for hake. Both trawls and hand-lines are used.

GROUNDS SOUTHWEST OF MONHEGAN ISLAND.

MONHEGAN INNER SOU'-SOU'WEST GROUND.—This piece of ground derives its name from its bearings, lying as it does to the south-southwest of Monhegan light-house, at a distance of about five miles; its length in a south-southwest and north-northeast direction is about one and one-half miles, and its width one and one-fourth miles. It has a sharp, broken, rocky bottom, and includes a very small shoal of twenty fathoms and several other hummocks with somewhat greater depths. The deepest water is fifty fathoms. This ground is fished on mostly by the Monhegan boats in the spring, from May until July, for cod and pollock.

MONHEGAN OUTER SOU'SOU'WEST GROUND.—This ground bears the same as the last, the center being nine miles distant from Monhegan light-house. It is four miles long, south-southwest and north-northeast, and about two miles wide. The depths range from sixty to eighty fathoms, the bottom being generally pebbly and quite level. This is considered a good ground for cod in the spring and fall, and is resorted to by the small boats from Monhegan and by small fishing-vessels, ranging in size from fifteen to twenty tons, and owned between Portland and Isle au Haute, which visit these shoal spots during the spring and summer.

GROUNDS WEST OF MONHEGAN ISLAND.

OLD JEFFREY'S.—This is an exceedingly good ground for fish, and it is said that better fishing may be obtained here than on any other ground of its size in the vicinity. In the spring, cod are most abundant, while hake, together with cod and pollock, are taken in the late summer and fall. This ground bears southeast from Pumpkin Rock from which the center is distant about six miles. It is about three miles long, southwest and northeast, and about a mile wide. The depth varies from twenty-five to fifty fathoms, the bottom being broken and consisting of rocks, gravel, and mud.

MONHEGAN WESTERN GROUND.—This ground, which is of considerable extent, lies about four and one half miles west-southwest from Monhegan Island. It has depths of twenty-two to forty-five fathoms, the bottom being rocky and gravelly, and considerably broken in places. It is considered a good feeding-ground for fish, cod being abundant in the spring and hake in the summer, when dogfish are not too plentiful. The length of the ground is about four or five miles, and it is nearly two miles wide on the eastern or widest portion, gradually narrowing toward the western end, where the breadth does not exceed one mile.

BROKEN GROUND.—The center of this ground bears nearly south from Pumpkin Island (entrance to Boothbay Harbor); distance, seven miles. It extends four miles in an east-northeast and west-southwest direction, and has an average width of one and three-fourths miles. The depths range from thirty-five to fifty fathoms, the bottom being composed of rocks and mud. Cod occur here the year round, and hake are taken from June to September.

GREAT LEDGE bears south by east, distant twelve miles, from Cape Newagen; it is about four miles long, south-southwest and north-northeast, and from one to two miles wide. It is said to have a shoal of fourteen fathoms on the northern edge, and another of twenty-two fathoms near the center. These shoals are broken and rocky, but the main portion of the ground, having depths of thirty to forty-five fathoms, is mostly composed of sand, and is quite level, sloping gradually toward the edge. This is a good ground for haddock and cod in the winter and for cod in the spring; a few pollock are also taken at times.

GROUNDS BETWEEN MONHEGAN ISLAND AND PEMAQUID.

MIDDLE GROUND.—This piece of shoal ground lies about in midchannel between Monhegan Island and Pemaquid, and has a shoal of three fathoms on the eastern part, where the water breaks in heavy weather. This shoal is called Moser's Ledge, and is broken and rocky, but the ground slopes off gradually to the southwest, reaching a depth of forty-eight fathoms, with a bottom of gravel and mud on the deepest part. The ground is about two miles long, southwest and northeast, and about a mile wide. Boats fish here for cod and haddock in the spring.

JOHN'S HEAD GROUND lies about four miles south-southeast from Pemaquid Point. It has depths of twenty-five to thirty-five fathoms, with a sandy bottom, and is a good locality for cod during April and May, when it is much resorted to by small boats from Bristol. This ground is circular in shape and about one mile in diameter.

WHITE ISLAND GROUND bears east-southeast from the White Islands, from which the inner edge is distant about half a mile and the outer edge about four miles. In outline this ground is triangular and somewhat resembles a harrow, being widest at the outer end. It is very broken and uneven, the depths ranging from six to thirty fathoms. In some places the bottom is gravelly, but on the shoals it consists of sharp, broken rocks. These small, rocky spots are known by other names, for instance, Brown's Head Ground, on which the fishermen catch a few rock-cod, and a number of others which are resorted to by small boats.

GROUNDS OFF SEGUIN ISLAND.

HILL GROUND bears south-southwest from Seguin Island, distance about three miles. It is three miles long, southwest and northeast, and about three-fourths of a mile wide. The depths range from twelve to twenty-three fathoms, and the bottom is uneven. The northeast part is very rough, with several shoal spots, having depths of twelve to fourteen fathoms, while between them the depths vary from twenty to twenty-three fathoms. The southern part, though rocky, is

more even than the northern. Cod, hake, and pollock are the principal fish found here. Both trawls and hand-lines are used.

SEGUIN SOU'SOU'WEST GROUND bears south-southwest from the western part of Seguin Island, from which the center is distant four miles. It is a rocky shoal, about one-half mile long by two hundred yards in width, with a shoaler portion in the center about one-half acre in extent. The marks are Elwell's Rock, touching the west side of Seguin, and Fuller's Rock, touching the southern part of Bald Head. The depths range from seven to fourteen fathoms. This ground is resorted to by boat fishermen in September for rock-cod, fishing wholly with hand-lines. It is evidently a south-southwest continuation of the Hill Ground.

SEGUIN RIDGE bears about southwest by south from Seguin Island; distance, a little more than three miles. It is about one mile long in an east-southeast and west-northwest direction, and one-fourth of a mile broad. It consists of a number of small, rocky hummocks, with depths of nine to fourteen fathoms, on which cod are taken by the small-boat fishermen in the fall.

SEGUIN GROUND bears southwest by south from Seguin Island, from which the center is distant about seven miles. It is about four miles long, southwest and northeast, and a little more than two miles broad in the widest part. There is a small hummock, called Bumper's Island Ground, on the northern end, with a depth of thirteen fathoms. The northern part is mostly rocky, but toward the south the bottom is gravelly and sloping, so that on the middle and southern portions there are depths of thirty-five to forty-five fathoms. Cod, hake, haddock, and pollock are taken on these grounds, which are considered to furnish the best fishing in the vicinity of Seguin Island. Both trawls and hand-lines are used.

MCINTIRE REEF bears south-southwest from Bald Head (Cape Small Point); distance to the center, four and one-half miles. It is two miles long, northeast and southwest, by one-half mile wide. This reef is very broken and hummocky, with a rocky bottom, and depths of water ranging from fourteen to twenty fathoms. It is resorted to by the small-boat fishermen of Casco Bay, who fish for cod with hand-lines. Just to the eastward of this is a piece of bottom composed of hard mud and shells, where hake are usually quite abundant in the summer.

COW GROUND bears nearly southwest from Bald Head, from which the center is distant six and one half miles. This ground is nearly four miles long, in a northeast and southwest direction, and about one and one-half miles wide. The northeast portion is rocky and rough, with depths varying from sixteen to eighteen fathoms, while on the southwest part gravel and pebbles predominate, and the bottom slopes to depths of twenty to thirty fathoms. Cod and pollock are the principal fish occurring here.

MURR HUB bears south by west one-quarter west from Small Point, from which the center is distant ten and three-fourths miles. This ground is three miles long, north and south, and has an average width of one and one-half miles. The depths vary from thirty-four to forty-five fathoms. The inner part of the Hub is shoalest, and there the bottom consists of sharp, broken rocks. From this shoal the ground slopes gradually to the south, where it is composed of sand and gravel. Large quantities of marine invertebrates, affording food for the fishes, are brought up on the fishermen's hooks here as elsewhere. Cod occur from spring until October, hake from June to October, and haddock during the winter. Trawls only are used.

TAG GROUND lies between the Broken Ground and Seguin Island, bearing east-southeast from the latter; distance, five miles. This is a narrow, rocky ridge, about two miles long in a north northeast and south-southwest direction, with an uneven bottom and with depths varying from fourteen to thirty fathoms. It is principally frequented by small fishing boats.

KETTLE BOTTOM.—The center bears south from Seguin Island, from which the inner edge of the ground is distant ten miles. Its length is twelve miles in a north and south direction, and its width about ten miles, the shape of the ground being nearly circular. This is an uneven piece of bottom, consisting of rocks, gravel, and mud, the depths ranging from twenty-five to seventy-five fathoms. This is considered one of the best, if not the best, fishing-ground on this part of the coast. Cod are the most abundant fish and are taken the year round. Haddock abound in the winter. More fish are taken from this bottom than from any other single ground in the vicinity of Seguin. Harpswell and Portland boats fish here.

GROUNDS OFF CASCO BAY.

WEST COD LEDGE consists of a succession of rocky patches, extending about four and one-half miles in an east-northeast and west-southwest direction, with a width of about half a mile, the southwestern end of which bears southeast three-quarters south from Portland Head light; distance, four and three-fourths miles. The northeastern extremity lies from six to seven miles east-southeast from Portland Head light. The shoalest portion of this ledge has a depth of fourteen to eighteen feet; on other parts the depths vary from five to twenty-two fathoms. The bottom is irregular and composed of rocks and gravel. This is a favorite ground for small-boat market fishermen from Portland, cod and haddock being the fish principally taken.

GROUNDS OFF CAPE PORPOISE.

Lying off Cape Porpoise, between the bearings of southeast and south-southwest, and at distances varying from six to eight miles, are a number of small, rocky or pebbly patches of ground, having depths ranging from eighteen to twenty-five fathoms. During certain seasons they abound in cod and haddock and are visited by the fishermen of the vicinity.

TANTER bears south from Cape Elizabeth, from which the center is distant eight miles. It is from two to three miles in diameter, with a depth of about forty fathoms, and a bottom of rocks and gravel. An excellent fishing-ground for cod in the spring.

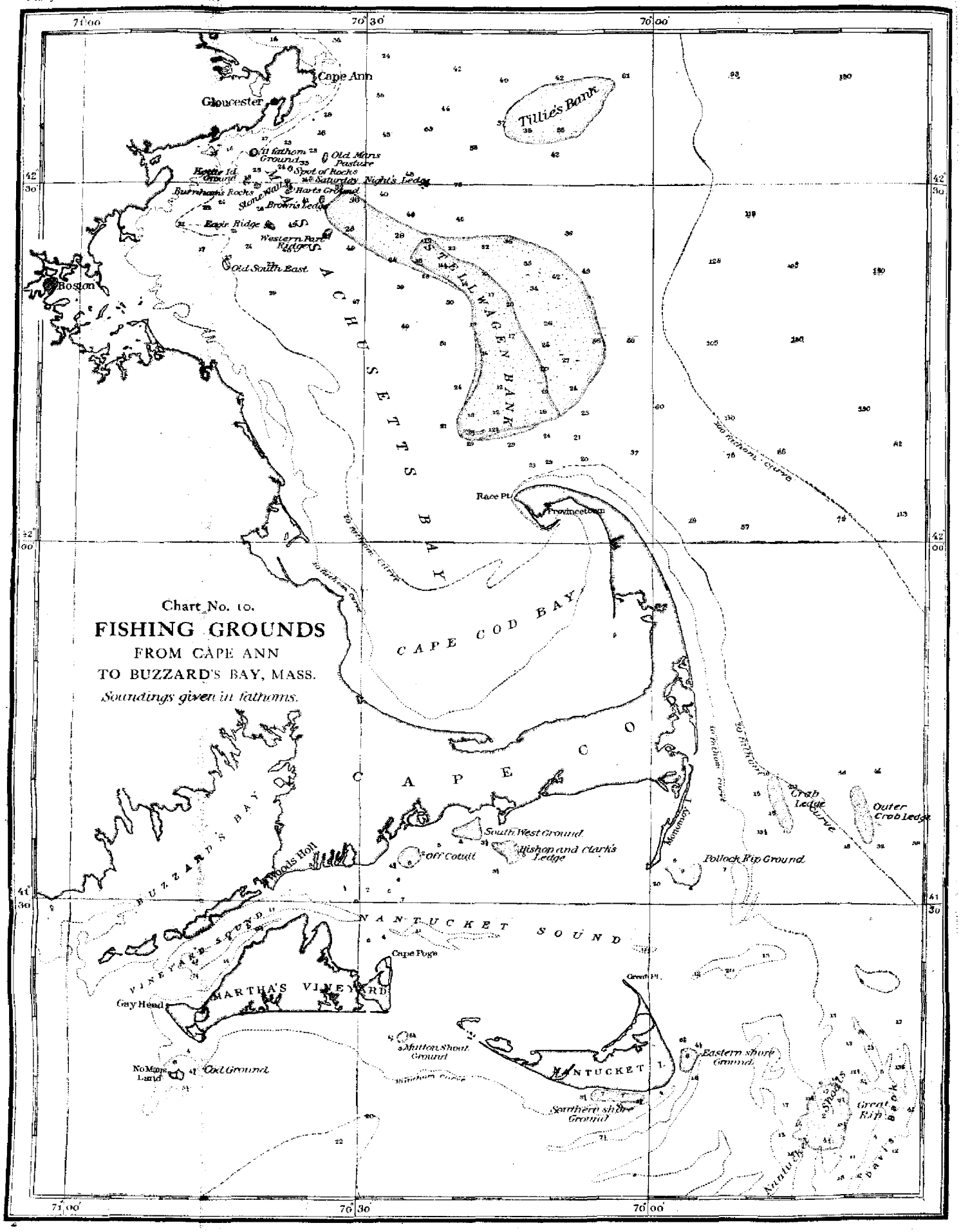
OUTER AND INNER BUMBO.—These are two small, rocky patches (large enough for only a single vessel to lie upon) bearing northwest from the Tracadia Ground, from which they are distant two and one-half and three miles, respectively, the Outer Bumbo being the nearest.

NUBBLE RIDGES consist of four or five narrow, rocky ridges, bearing southeast from the Nubble, and extending in the direction of Boone Island; they begin near the main shore and extend nearly to the island. The depths of water upon them vary from eleven to twenty fathoms. These ridges are much resorted to by small vessels and open boats, and good catches of cod and haddock are made in the spring and fall, but especially in the latter season, when both trawls and hand-lines are used.

CAPE PORPOISE PEAKS are a number of small, rocky patches, bearing about southeast from Cape Porpoise, from which they are distant four to five miles. These spots are in depths of twenty to forty fathoms, are considered good grounds for cod, haddock, and cusk, and are much resorted to by the boats and small vessels of the vicinity.

TRACADIA bears northeast from Boone Island, from which it is distant five miles. It is one-half mile in diameter; has a depth of fifty fathoms, and a bottom of rocks and gravel. A good haddock ground the entire year.

BLUE CLAY bears south-southeast from Boone Island, from which it is distant eight miles. This ground is nearly square, and four to five miles across, with depths ranging from forty-eight


71°00'
70°30'
70°00'
42°30'
42°00'
41°30'
41°00'
Cape Ann
Gloucester
Tillie's Bank
Old Mans Pasture
Saturday Night's Ledge
Burnham's Rocks
Stone Wall
Harts Ground
Brown's Ledge
Eagle Ridge
Western Part Ridge
Old South East
Boston
MASSACHUSETTS BAY
STELLWAGEN BANK
30 Fathom Curve
Race Pt.
Provincetown
CAPE COD BAY
CAPE COD
Chart No. 10.
FISHING GROUNDS
FROM CAPE ANN
TO BUZZARD'S BAY, MASS.
Soundings given in fathoms.
BUZZARD'S BAY
Woods Holl
South West Ground
Off Cotuit
Hishon and Clark's Ledge
Monomoy I.
Pollock Rip Ground
Crab Ledge
Outer Crab Ledge
NANTUCKET SOUND
VINEYARD SOUND
Cape Poge
MARTHA'S VINEYARD
Gay Head
No Mans Land
Old Ground
Mutton Shoal Ground
Eastern Shore Ground
NANTUCKET I.
Southern shore Ground
Great Rip
Shoals
Great Back
Nantucket Shoals

to sixty fathoms, and a bottom of tough blue clay. This is the best winter haddock ground in the vicinity, and is much resorted to at that season by the haddock trawlers.

DUCK ISLAND RIDGES.—These are two narrow, rocky ridges running out from Duck Island (one of the Isles of Shoals) in the direction of Boone Island, reaching to within a mile of the latter. The depths range from twenty-five to thirty fathoms. A good ground for haddock and cusk in the winter and spring, and resorted to by open boats, and also by many large vessels.

BOONE ISLAND ROCK GROUND begins one-half mile to the eastward of Boone Island Ledge, and runs in an east-southeast direction for a distance of two to three miles from the ledge, having a bottom of sharp rocks and clay, and depths ranging from forty to sixty fathoms. It is considered an excellent fishing-ground for cod, haddock, and cusk, and one of the best winter haddock grounds in the vicinity, at which season it is resorted to by the trawlers.

TEN ACRES bears south from Boone Island and east from the Isles of Shoals, these cross bearings meeting near the center of the ground, which is about five miles in diameter, with a small, rocky shoal (one-fourth mile wide) in the middle; on this shoal there is a depth of eighteen to twenty fathoms. The bottom around the shoal consists of clay and mud, and slopes gradually to depths of fifty to sixty fathoms near the edge. This is a good fishing-ground for cod, haddock, cusk, and pollock, while on the muddy bottom surrounding it large quantities of hake are taken.

In addition to the above-described grounds, there are in Well's Bay several small, rocky patches of less importance which are chiefly resorted to by small-boat fishermen.

7. THE COASTS OF NEW HAMPSHIRE AND MASSACHUSETTS TO NANTUCKET.

IPSWICH BAY.—Ipswich Bay, from the north side of Cape Ann to about Portsmouth, is resorted to during the winter season by large schools of cod, which visit this region to spawn. The shore soundings of the bay gradually deepen outwards from the land, reaching depths of thirty-five to forty fathoms at a distance of six to seven miles from shore. Within this limit, the bottom is mainly composed of sand, although there are numerous rocky patches between Newburyport and Cape Ann. Beyond a depth of forty fathoms, however, the bottom consists mostly of mud. The principal codfishing-grounds of Ipswich Bay lie off the northern shore, from Newburyport to the entrance of Portsmouth Harbor, at a distance of one and a half to five miles from the land, where the water is from twelve to twenty-five fathoms deep. Cod are also taken abundantly on the ledges at the south. A large fleet of vessels engage in this fishery in winter. Prior to 1880, trawls and hand-lines were universally used by the shore fleet, but in that year gill-nets were introduced with good results.

The area of muddy bottom outside is generally a favorite fishing-ground for hake in the late summer and fall. This fishery is participated in by the open-boat fishermen of eastern Cape Ann and the Isles of Shoals, and by small vessels coming from more distant places.

MASSACHUSETTS BAY.—The larger part of this bay, inside of Stellwagen's Bank, has a muddy bottom, on which large quantities of fish are rarely taken. Farther in, however, on the shore soundings, especially between the entrance to Boston Harbor and Plymouth, exist numerous rocky ledges, which are favorite feeding-grounds for cod in the fall and winter. This region is frequented by the Swampscott fleet and by other vessels supplying the Boston market. Near the center of Cape Cod Bay there is a rocky elevation, on which cod are taken, and numerous other ledges of larger and smaller size lie off the south side of Cape Ann.

Herring make their appearance about Cape Ann in the month of September. They come in large numbers, and remain about two weeks, the best fishing, however, continuing only about

one week. The school then moves slowly inward toward the head of the bay, the last fish being taken usually in the vicinity of Minot's Ledge, off Boston.

The mackerel, in the course of their autumn migrations after leaving the coast of Maine, pass in by Cape Ann and enter Massachusetts Bay, where they are generally taken in large quantities during October and November, by vessels of the regular mackerel fleet, using purse-seines.

GROUNDS IN THE VICINITY OF EASTERN POINT, CAPE ANN.—*Old Man's Pasture* bears southeast, distant five miles, from Eastern Point light. It is about three-fourths of a mile long, north-northeast and south-southwest, by one-third of a mile wide, the average depth of water being twenty-four fathoms; the bottom is rough and rocky. Cod occur here the entire year.

Western Part Ridge bears south by east half east from Eastern Point light; distance, about nine and one-fourth miles. The length, northeast and southwest, is one and one-half miles, and the average width three-fourths of a mile. The average depth is twenty-nine fathoms, the bottom being broken and rocky. Small vessels and open boats visit this ridge for cod and haddock in the summer.

Harl's Ground bears south half east from Eastern Point light; distance, five and one-half miles. Its length, in an east-northeast and west-southwest direction, is three-fourths of a mile, and its width one-fourth of a mile. This is a rocky patch with a depth of water of about thirty fathoms, and is visited by boat fishermen for haddock in the summer.

Eagle Ridge lies seven and two-thirds miles south by west from Eastern Point light, and is one mile long, southeast and northwest, by one-third of a mile wide. It has an average depth of twenty-five fathoms and an uneven rocky bottom, and is a favorite winter ground for cod.

Inside of the above-described grounds, at an average distance of two and one-half miles from Eastern Point light, and between the bearings of south half east and southwest, are a number of small rocky patches, with depths ranging from ten to twenty-five fathoms, designated as follows: *Brown's Ledge, Spot of Rocks, Stonewall, Saturday Night's Ledge, and Burnham's Rocks.* Still farther in are two other shoal spots, bearing nearly west from Eastern Point, one of which is distant about three-fourths of a mile, the other a little more than two miles. Each of these has a depth of about eleven fathoms, the former being called *Eleven-fathom Ground*, and the latter, which lies only half a mile southeast of Kettle Island, *Kettle Island Ledge.* Both of these patches are fished on by the boat and dory fishermen, using hand-lines, for cod in winter and for haddock in summer.

Numerous other rocky hummocks, of very limited extent, are located easterly of the grounds already described and within a few miles of them. They bear local names, and are less frequented than the larger areas, and the fishermen only reach them by means of cross-bearings from objects on land. The chief winter-grounds for cod in the vicinity of Eastern Point are Old Man's Pasture, Eagle Ledge, and Brown's Ledge.

STELLWAGEN'S BANK or MIDDLE BANK separates Massachusetts Bay from the Gulf of Maine, and extends from near Cape Ann to near Cape Cod. The center of the bank bears about south by east half east from Thatcher's Island, and north by west half west from Highland light, Cape Cod. The southern point of the bank is distant about five and one-half miles from Race Point, Cape Cod, and the northwest prong reaches to within about twelve to fifteen miles of Eastern Point, Cape Ann. The shoaler portion, with depths of from nine and one-half to nineteen fathoms, is seventeen and one-half miles long, in a north by west and south by east direction, and has an average width of four miles. This part of the bank is sandy, but on the eastern slope, in depths of twenty-five to fifty-five fathoms, it consists of coarse sand, gravel, and pebbles. On this

gravelly slope, for a number of years, haddock and cod were taken in abundance, the former in winter, the latter in fall and spring. The fishery was continued on a large scale until as late as 1875, and is even now carried on to a greater or less extent by the smaller vessels composing the coast fleet. The grounds off the southern end of the bank, and between it and Race Point, abound in cod in the fall and winter.

EAST SIDE OF CAPE COD.—The sea bottom off the east side of Cape Cod is sandy, and slopes off gradually from the beach, reaching depths of thirty to forty fathoms at distances of five to seven miles from land; below Chatham the slope is even more gradual. Within these limits good catches of cod are occasionally obtained, and the same is true of haddock, though to a less extent. Farther from shore, in depths of forty to eighty fathoms, and from a point eight to ten miles off the highlands of Cape Cod to another point lying twenty miles or more east-southeast of the Chatham lights, there is one continuous stretch of excellent winter haddock grounds, which were first generally fished upon about 1870. From that time until about four or five years ago, these grounds were much resorted to during the most of the winter months, and they still afford abundant catches to the vessels of the shore fleet.

MORRIS LEDGE, lying to the eastward of Chatham, is a favorite locality for certain codfishermen during the spring and early summer.

Two very excellent fishing-grounds for cod lie off the southeastern part of Cape Cod; one of these is situated close inshore; the other is an off-shore ledge. They are described as follows:

OUTER CRAB LEDGE.—The center of this ledge lies about fourteen miles east-southeast of Chatham lights; it extends about five or six miles in a north and south direction, and is about one mile broad. The depth of water ranges from nineteen to twenty-three fathoms; the bottom is rocky. Cod are more or less plentiful on this ledge during the entire year, but are fished for during the fall, winter, and spring, the same fishermen engaging mainly in bluefishing during the summer. The boats used are large cat-rigs, of twenty to thirty-five feet in length, and belong mostly to Chatham; a few also hail from Harwich. From seventy to eighty boats of this character may often be seen about this ledge at the same time. In former years, this ledge was frequented by large well smacks, of thirty to fifty tons burden, belonging to the south shore of Cape Cod. It is now occasionally resorted to by large Gloucester schooners.

POLLOCK RIP GROUNDS lie between Pollock Rip light-ship and Shovelful light-ship, and extend northward to Pollock Rip Shoal. The extent of these grounds is about three miles east and west and two miles north and south, the depths of water ranging from four to twelve fathoms. They are fished upon during the spring and fall by cat-rigged boats from Monomoy. In stormy weather Chatham boats also frequently resort to them, instead of going to Crab Ledge. Late in the spring and early in the fall, the cod move in nearer shore, and may be caught between Brush's shoal and Monomoy light. In the winter, however, the cod entirely leave Pollock Rip Grounds, and move into deeper water.

NANTUCKET SHOALS.—There are three principal codfishing-grounds included in these shoals. They are as follows:

Great Rip lies about thirteen miles east by south one-half south from Sankaty Head, Nantucket, and is about five miles long north and south, and three miles broad. Over this area the depths are only nine to eighteen feet, but fishing is mainly carried on around the edge of the shoal, in depths of six to twelve fathoms, where the bottom consists of gravel and shells, covered with sponges, kelp, etc. This region is visited mostly by well smacks from the ports of Long Island Sound, which fish more or less during the entire year, and carry their catch alive to New York. More fishing is done here during the winter and spring than at other seasons.

Fishing Rip is an elongate bank, situated about twenty-nine miles southeast from Sankaty Head light. It extends about ten miles in a northeast and southwest direction, and is about one and one-half miles broad; the depths of water upon it vary from four and three-quarters fathoms to eight and three-quarters fathoms. The character of the bottom is the same as upon Great Rip, and it is visited by the same fleet of fishing-vessels, and also occasionally by smacks from Nantucket.

Phelps' Bank lies about thirty-eight miles southeast one-half south of Sankaty Head light, and agrees more or less in size, shape, trend, and character of bottom with Fishing Rip. The depths of water range from ten to seventeen fathoms. It is resorted to occasionally by the same fleet of smacks that visit the two preceding banks.

Strong tidal currents flow over these three banks, the flood tide running northeast and the ebb southwest.

8. THE GULF OF MAINE.

The Gulf of Maine constitutes one of the most important fishing areas of the eastern coast of North America, both from the abundance of fish which resort to it and its close proximity to numerous large and enterprising fishing ports. It is nearly rectangular in shape, being bordered on the north and west by Maine, New Hampshire, and Massachusetts; on the south by George's Bank; and on the east by Nova Scotia, Brown's Bank, etc. Its greatest length is from Cape Cod to Cape Sable, the distance between these two points being about two hundred and fifteen miles. The average breadth at right angles to this line is about eighty miles. The area of the Gulf is, therefore, more than seventeen thousand square miles, all of which is more or less available for fishing of one kind or another. From the sixty-fathom line, which lies from twelve to twenty-five miles off the coast, the bottom descends rapidly in some parts, in others more gradually, to depths of one hundred to one hundred and sixty fathoms, nearly all the deeper tracts having a bottom of mud, on portions of which hake are sometimes abundant. To the north of the center of the Gulf, along a line running more or less directly from Cape Ann to the mouth of the Bay of Fundy, are distributed a number of elevated, gravelly, rocky patches of greater or less size, which are described below, and on which cod and haddock feed in immense numbers. These grounds are mainly visited by vessels of from fifteen to fifty tons, belonging to the New England fishing fleet. The mackerel fisheries of the Gulf of Maine are now the most important in the world. From the first of June to November, this species of fish is more abundant here than elsewhere along the coast, and the schools are distributed over the whole extent of the Gulf from the shores outward, irrespective of the depth of water. The shallow-water fishery is described elsewhere, but it is in the deeper waters, where the immense purse-seines can be freely used, that the large catches are made. Formerly, the Gulf of Saint Lawrence was most resorted to by the mackerel catchers of our ports, but since the introduction of purse-seines for the capture of this fish, the shallow waters of the Saint Lawrence have been largely deserted by the vessels of our fleet, which have been able to obtain much more profitable fares nearer home.

Herring also abound in the Gulf of Maine, where they used to be taken in gill-nets for use as bait by the fishermen at anchor on the cod grounds. This was at one time the principal method resorted to by the fishermen of the Gulf of Maine for securing bait, but now almost all the herring so used are obtained from the harbors and islands along the shore.

GRAND MANAN BANK.—Grand Manan Bank lies at the entrance to the Bay of Fundy, and bears southwest one-half south from the southwest head of Grand Manan Island, from which the northern part of the bank is fifteen miles distant. It is ten miles long and five miles wide, and

extends in a southwest and northeast direction. The bottom is mostly composed of stones and gravel, and the depths of water vary from twenty-four to forty-five fathoms. The tides are quite strong over this bank, but not sufficiently so to prevent trawling. Cod and pollock are the principal fish occurring here, cusk, hake, haddock, and halibut being less plentiful. The fishing season is from April to October, during which time the fish come on the bank to feed. In the spring, the fish are usually most abundant on the southwest portion, but later in the season the best fishing is generally obtained on the other end of the ground. This bank is a favorite fishing-ground for that class of small vessels known as the shore fishermen.

GERMAN BANK.—Although this bank is not usually laid down on the charts, it is one of the most important in the Bay of Fundy. It bears southeast from Baker's Island light, Mount Desert, from which the northwest part is about fifty-two miles distant. The length is about fifteen miles and the width nine to ten miles. It lies between 43° 38′ and 43° 53′ north latitude, and 66° 58′ and 67° 15′ west longitude. There are from sixty-five to one hundred fathoms of water. The bottom is mostly a tough red clay, but with spots of mud, sand, gravel, and pebbles on some parts. The tides set out and in over the bank, to and from the Bay of Fundy, the ebb running about southwest and the flood northeast, but the currents are not so strong as might be expected. Cod, hake, cusk, and haddock are the fish chiefly taken, but a few halibut and pollock are occasionally caught. The fishing season is from April to October, although fish are usually most abundant in the spring. This bank is mainly resorted to by vessels from the coast of Maine, but is sometimes visited by the Massachusetts fishermen.

MARBLEHEAD BANK.—This fishing-ground, which is quite an important one for the shore codfishermen, is not laid down on the published charts, and the fishermen who visit it are, therefore, probably the only persons familiar with its location and extent. The ground, which they call Marblehead Bank, is situated between Grand Manan and German Banks, the shoal water bearing south-southeast from Moos-a-Bec light, and being distant thirty-two miles. It is about twelve to fifteen miles long and seven or eight miles wide, and lies between 44° 00′ and 44° 10′ north latitude, and 66° 58′ and 67° 13′ west longitude. There are from thirty-five to seventy fathoms of water over it, and the bottom is mostly clay and gravel. The fish which occur in the greatest numbers are cod, pollock, and haddock, but with these are also found more or less hake and cusk. The best fishing is generally in the spring and early summer. The same class of vessels, the shore fishermen, which frequent Grand Manan and German Banks also resort to this bank, but occasionally those of a larger size make one or more trips to it during the summer season.

JONES' GROUND.—This is quite an important fishing-ground for cod, and, though of comparatively small size, is much resorted to by many of the same vessels that also visit the other banks in the Gulf of Maine. The western part bears southeast from Baker's Island, from which it is distant thirty-two miles. The entire ground is about ten to twelve miles long, northeast and southwest, and five miles wide. The depths range from fifty to one hundred fathoms, and the bottom, which is quite broken, consists of rocks, gravel, and mud. On the northeast part of the ground, where the depths vary from fifty to seventy fathoms, the bottom is rocky and rough. This part bears southeast by east, one-half east, from Baker's Island light, from which it is distant about thirty-five miles. The entire ground furnishes good trawl fishing from the first of May to the last of September. The principal fish taken are cod of large size; a smaller amount of hake, cusk, pollock, and haddock are also secured.

CLAY BANK bears southwest by west from Mount Desert Rock, from which the center is distant seven miles. It is four miles long, west-southwest and east-northeast, by two miles broad.

The depths are fifty to eighty fathoms, and the bottom consists of hard clay. The principal fish taken here are cod.

BANK COMFORT, which is a comparatively little known fishing-ground, bears southeast by south from Mount Desert Rock; distant thirteen miles. It is said to be about five miles long, southwest and northeast, by three miles wide; has a hard gravelly bottom, and depths ranging from seventy-five to eighty fathoms. It is considered an excellent fishing-ground for cod in the spring and summer, but is less frequented than some other localities, since its small size renders it difficult for the fishermen to find it, except under the most favorable circumstances.

JEFFREY'S BANK.—This bank, which lies east of Cashe's Ledge, is of comparatively little importance as a fishing-ground. It is about twenty miles long, southwest and northeast, and ten miles wide, the northern and southern limits being 43° 30′ and 43° 15′ north latitude. The eastern edge is in 68° 25′ and the western in 68° 45′ west longitude. The bottom, which is somewhat broken, is composed of mud, sand, gravel, and pebbles, the depths of water ranging from thirty-five to seventy fathoms. Cod, haddock, hake, and cusk are the most abundant fish; some pollock are caught, but halibut are rarely taken. The best season is late in the spring and early in the summer, before the schools of dogfish strike in, after which but few fish can be obtained. This bank is resorted to by the smaller-sized vessels, from fifteen to fifty tons.

NEWFOUND AND MONHEGAN FALL GROUNDS are evidently parts of Jeffrey's Bank, according to the statements of intelligent fishermen who have visited them. Newfound Ground is on the eastern part of the bank, and has a very irregular and broken bottom. Monhegan Fall Ground lies westerly from Newfound. Both of these grounds used to furnish excellent fishing, but are not now resorted to as much as formerly.

CASHE'S LEDGE.—This is not now a very important fishing-ground except for a brief period in the spring, although it is resorted to somewhat by the shore fishermen in summer and fall, when good trips are usually obtained. It bears east from Cape Ann, from which the shoaler portions are seventy-six miles distant. The bank is about twenty-two miles long, from 42° 49′ to 43° 11′ north latitude, and about seventeen miles wide, from 68° 40′ to 69° 03′ west longitude. There are three small shoals on the western part of the bank, the southern one with a depth of seven fathoms of water, the middle one with four fathoms, and the northern one with eleven fathoms. The position of the middle shoal is 42° 56′ north latitude and 68° 52′ west longitude. From this the south shoal bears south by east, and the north shoal north-northeast, each being three and one-half miles distant from it. The water breaks on these in rough weather, and though of small extent they are dangerous to passing vessels, especially as they lie almost directly in the track of vessels bound from Cape Sable to ports in Massachusetts Bay. With the exception of the shoals the depth of water ranges from fifteen to sixty fathoms. The ground is more or less broken, with a bottom of sand, pebbles, and rocks. The greater part of the fish caught here are cod, hake, and cusk. Halibut are rarely seen, and haddock and pollock are less plentiful than the other kinds. Good fares are often secured on the edge of the ground in May and June, but the dogfish, which appear about the last of June or in July, usually drive everything before them, and, for a time, stop the fishing. The vessels fishing on Cashe's Ledge range from fifteen to forty-five tons, and are classed as shore-trawlers.

FIPPENIES BANK bears east one-quarter south from Thatcher's Island; distance, sixty-one miles. It is nearly ten miles long north and south, and has an average width of four and one-half miles. The bottom consists of gravel, pebbles, and clay, the depths ranging from thirty-six to sixty fathoms. Resorted to by the shore fleet in the spring and early summer.

PLATT'S BANK, OR NEW LEDGE, bears east by north one-half north from Thatcher's Island, from which the shoal portion of the ledge is distant fifty-three miles. This bank is twelve miles long, southwest and northeast, and eight miles wide. The shoal, which is rocky and of small extent, is situated near the center, and has a depth of twenty-nine fathoms. Over a large extent of the bank the depths range from thirty to thirty-five fathoms, with a bottom of rocks and gravel. From the edge of this area the bottom slopes gradually to a depth of fifty to sixty fathoms; beyond which it drops suddenly to eighty or ninety fathoms with a muddy bottom. This is considered one of the very best fishing-grounds for cod and haddock in the Gulf of Maine, and hake are generally abundant during the summer on the muddy bottom near its edge. Trawl-lines are used. Resorted to by the shore fishing-vessels from all along the coast, from Cape Cod to Maine.

MISTAKEN LEDGE bears north from the center of New Ledge, from which it is distant about ten miles. This ground is about eight miles long in an east and west direction, and five miles wide. The depths range from thirty-five to sixty fathoms, and the bottom consists of rocks and gravel. In proportion to its size this ground is nearly as important as New Ledge, being resorted to by the same species of fish and visited by the same class of fishing vessels.

JEFFREY'S LEDGE.—This may be considered one of the best shore fishing-grounds in the Gulf of Maine, although it is of comparatively small size. It appears to be an extension of the shoal ground that makes off in a northeasterly direction from Cape Ann; it is about twenty miles long, northeast and southwest, and from two to four miles wide. Its southern limit is 42° 54′ and its northern 43° 11′ north latitude, and the eastern and western boundaries may be placed at 69° 58′ and 70° 18′ west longitude. The bottom is rocky on the shoalest parts, with gravel and pebbles along the edges. The depths of water range from twenty-seven to thirty-five fathoms on the bank, and fall off to forty and fifty fathoms at the edges. There is usually little or no tide, although an occasional current sets toward the southwest. Cod, cusk, and haddock are taken in the fall, winter, spring, and early summer, with a greater or less quantity of hake or pollock. For a number of years Jeffrey's Ledge was a favorite winter fishing-ground for haddock, which were very abundant there, and even at the present time many vessels resort to it in pursuit of that species; but since the haddock fishermen have extended their cruises to the outer banks, a less number now visit Jeffrey's Ledge. Besides the haddock catchers, other vessels engaged in the shore fisheries come to this ground in the spring and fall.

EASTERN SHOAL WATER OF CAPE ANN.—This ground extends off in an east-northeast direction from Cape Ann, a distance of fifteen to eighteen miles. It is, in reality, a southwest continuation of Jeffrey's Ledge, the two forming a nearly continuous ridge, running northeast from Cape Ann, a distance of about forty-two miles. The depths of water on the so-called "Eastern Shoal Water" vary from twenty to forty-five fathoms, the bottom consisting of rocks, pebbles, and coarse gravel over the most of its extent. On the edges sand and mud occur. The eastern part of this ground is resorted to by the haddock fleet during the fall and early winter, and the other parts are visited more or less the entire year, for cod, haddock, and pollock, by the vessels composing the shore fleet, and by the boat fishermen of Cape Ann.

TILLIE'S BANK bears east by south one-half south from Thatcher's Island, Cape Ann, from which the shoal (located near the center of the ground) is distant eighteen miles. A small, rocky shoal, with a depth of twenty-eight fathoms (some fishermen claim a less depth), is situated near the center, outside of which the water deepens to forty fathoms, this depth occupying quite an extended area. The length of the entire ground is ten miles, in an east and west direction, and

the width about five miles. At the edge it falls off rapidly to depths of fifty to sixty fathoms, before reaching the mud at a still greater depth. The bottom is rough and rocky over the greater part. Tillie's was formerly regarded as one of the best fishing-grounds off Cape Ann, and is still resorted to for cod and in the fall for haddock. Trawls are the principal kinds of fishing gear in use.

9. THE SOUTHERN COAST OF NEW ENGLAND.

THE SHORE GROUNDS OF NANTUCKET.

There are two principal shore grounds for cod on the coast of Nantucket; one lies off the eastern side of the island, the other off the southern. The eastern ground extends from off Siasconsett (north of Old Man's Shoal) northward to off Sankaty Head light, a distance of two miles, and off shore from three-fourths of a mile to two miles, with depths of four and one-half to eleven fathoms. The bottom is gravelly, with mussels and kelp. These grounds are fished on by about seventy dories during the spring and fall. The southern grounds extend westward from Tom Never's Head to Weedweeder Shoal, a distance of four miles, and off shore a distance of about one mile. Fishing is carried on in depths of eight to ten fathoms, on sandy and shelly bottoms, by about thirty dories belonging to Nantucket town, but quartering at the South Shore Life-Saving Station. Both cod and haddock are taken in the spring and fall. In the summer this is a good bluefishing-ground, and the fishery is carried on by means of gill-nets and hooks and lines.

NANTUCKET SOUND.

BISHOP AND CLARK'S LEDGE, near Hyannis, is a very rough bottom, with some exposed rocks, and is about one and three-fourths miles long and five-eighths of a mile wide. Fishing for tautog is carried on here, in depths of three to six fathoms, during the entire summer, or from June to October or November. This ledge is visited by large cat-rigged boats from Hyannis, which fish with hook and line. It is also a good ground for lobsters.

SOUTHWEST GROUND, HYANNIS, extends from the breakwater, off Hyannis, out to Bell Buoy, a distance of about two miles, and westward to Collier's Ledge, a distance of two and one-half miles, with depths of ten feet to four fathoms; the bottom consists of sand, gravel, and rocks, covered with algæ and eel-grass. During June this is considered the best sea-bass ground on the Massachusetts coast. Tautog, scup, and bluefish are also taken from June to October. This ground is frequented by cat-rigged boats from Hyannis, Centreville, and Cotuit.

OFF COTUIT, over an area about two miles square, and with an average depth of three fathoms, gill-net fishing for bluefish is extensively carried on during June and July. As many as three hundred or four hundred gill-nets are often set there at a time.

MUTTON SHOAL GROUND lies in the outer or southwestern part of Muskeget Channel, and extends about one mile south from Mutton Shoal, with a width of about the same. The depths range from three and three-fourths to four fathoms. Cod and haddock are taken in the spring and fall, and bluefish in the summer, the latter being fished for mainly in the rips at the side of the channel, with hooks and lines. This region is frequented by the so-called "Vineyard-fishing boats" hailing from Edgartown, Martha's Vineyard.

VINEYARD SOUND.

Vineyard Sound, from Hedge Fence Shoal, off East Chop, Martha's Vineyard, to east of Gay Head, constitutes one of the most extensive sea-bass grounds of the New England coast. Fishing is carried on everywhere throughout this region in depths of six to twelve fathoms, where the

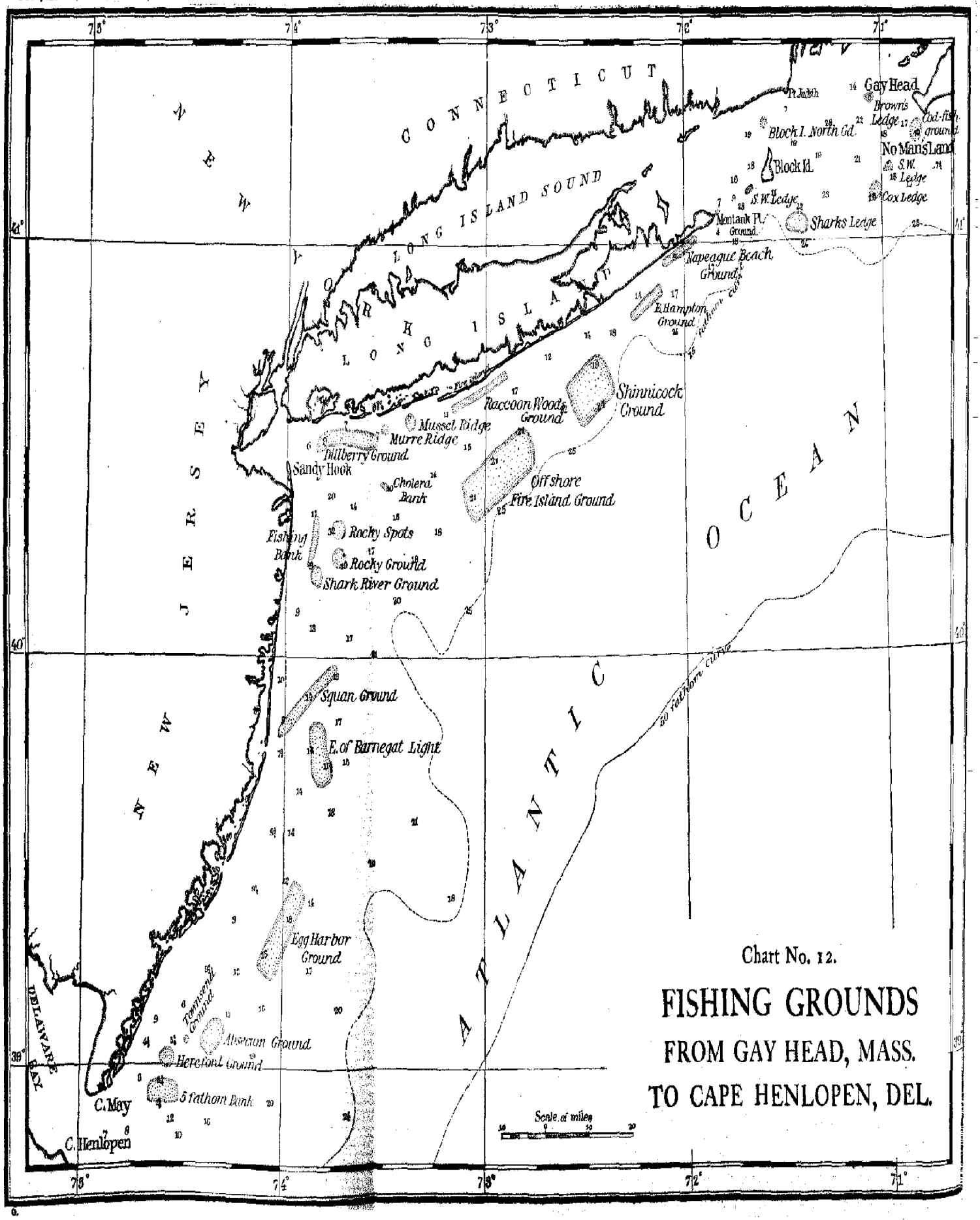


Chart No. 12.

FISHING GROUNDS

FROM GAY HEAD, MASS. TO CAPE HENLOPEN, DEL.

bottom is rocky, gravelly, or shelly. The fishing fleet consists of cat-rigged boats from Martha's Vineyard, Wood's Holl, and Falmouth, and well-smacks from New London and Noank, Connecticut, there being about fifty of the former class and thirty of the latter class regularly employed in this fishery. The season extends from the middle of June to the first of October; the boats shifting from place to place as the supply of fish becomes exhausted in each locality, and returning to the same ground at a later period. The well-smacks carry their catch directly to New York, but the fish taken by the smaller boats are shipped in barrels with ice.

Tautog are caught in small quantities along the western shore from Wood's Holl to Job's Neck, Naushon, a distance of about two miles, by the shore fishermen. They are also taken about Cuttyhunk through September and October, and likewise in November if the weather is moderate. The latter locality is considered to furnish the best tautog fishing of this region.

Lobster pots are set along both sides of the sound, from West Chop and Wood's Holl to Gay Head and Cuttyhunk, in depths of eight to fifteen fathoms. This was, in former times, a very valuable lobster region, and still remains so in its outer portions; but lobsters have become more and more scarce every year in the upper part of the sound, while they have apparently increased in abundance about Gay Head, Cuttyhunk, and No Man's Land. This fishery has, therefore, been mostly transferred to the outer grounds. The number of pots set in the sound during the past few years has varied from about 700 to 2,000 annually. Around Cuttyhunk about 900 pots are now in use. Very many pots are set just to the west and north of Gay Head, by parties residing temporarily at Menemsha Bight. Lobstering in the sound is confined to rocky and gravelly bottoms.

BUZZARD'S BAY.

The principal fishery of Buzzard's Bay is for tautog during the summer. Tautog appear at the head of the bay about May, and work into the shallow water farther out about a month later. The fishery is conducted on both sides of the bay, on rocky bottoms, in average depths of three fathoms, by a fleet of about twenty smacks from New Bedford and Westport, Massachusetts. Sea bass and scup are also taken during the summer months, but are not as abundant here as in Vineyard Sound.

OFF VINEYARD SOUND.

NO MAN'S LAND.—Cod are taken on all the rocky bottoms about this island during the fall and spring, and lobsters on all kinds of bottom during the spring and summer. The fall cod-fishery begins about the first of October, and continues until very stormy weather prevents the men from venturing out in their boats. About the first of April they begin to fish again for cod, and stop about the middle of May. The lobster season extends from the middle of May until about the twentieth of September. The bottom to the east and south of the island is sandy and gravelly; while to the west and north it is more or less the same, with numerous rocky patches. Codfishing is carried on from one-half to one and one-half miles from shore, in depths of four to ten fathoms, by about thirty boats using hand-lines only. The lobster pots are set from one-half to two miles from shore, in depths of ten to thirteen fathoms. There are from fifteen to twenty lobstermen fishing from here during the summer, using about one thousand pots. The catch for 1882 amounted to about one hundred thousand marketable lobsters. The fishermen of No Man's Land belong entirely to Martha's Vineyard, and live on the former island only during the fishing season; they use the "Vineyard fishing-boats." In addition to these, there are several well-smacks from New London and Noank, Connecticut, which visit this region more or less constantly during both the cod and lobster seasons, carrying their catch to New York.

SOUTHWEST LEDGE lies about thirteen miles southwest by south from Gay Head, Martha's Vineyard. It is oval in outline, extending about two miles east and west and one and one-fourth miles north and south. The depth of water is about fourteen or fifteen fathoms, and the bottom is rocky and gravelly. This is a very good cod ground, and is resorted to by New York smacks in the summer, and by schooners from New England in the spring, the former using hand-lines and the latter trawls.

COX'S LEDGE is a cod ground, the center of which lies about twenty-three miles southwest one-half west from Gay Head, Martha's Vineyard. It is elongate in shape, being four or five miles long, east and west, and about two miles wide. The depths of water range from fifteen to twenty-two fathoms. The bottom consists of rocks and gravel. Cod are found the entire year, and some haddock are also taken. This ground is frequented by eight or ten smacks from New Bedford and New London, and three large schooners from Fair Haven, Massachusetts, the former using hand-lines, the latter trawls. The smacks fish principally through the summer and the schooners through the early spring.

Several interesting small areas or "spots" about Cox's Ledge are known to the fishermen. They are of very limited extent, but are noted as furnishing excellent fishing. They are described as follows:

"Southwest Spot" lies about two miles southwest of the ledge. It has a hard bottom, and a depth of twenty fathoms. "West Spot" is about one-half mile west of the ledge, with the same character of bottom, and a depth of twenty-two fathoms. "Southeast Spot," situated about seven miles southeast of the ledge, has also the same bottom and a depth of eighteen fathoms. Other smaller and less defined spots occur in the same vicinity.

BROWN'S LEDGE lies six miles southwest by west from Sow and Pigs (Vineyard Sound) light-ship. It is about two miles square, and has a rocky bottom, with depths of seven to ten fathoms. Cod are taken here in the spring and fall, and tautog in the fall. This ground furnishes the last tautog of the season for this part of the coast. Fishing is carried on by smacks from New Bedford and Westport, Massachusetts. Some lobsters are caught on this ledge by Noank, Connecticut, smacks.

THE COAST OF RHODE ISLAND.

SHARK'S LEDGE bears southeast by south from Block Island light, nine miles to the center. Its length, east and west, is about five miles. This is a rocky ground, with about twenty fathoms of water, and is fished upon for cod and haddock during the winter, or from November to May or June, by New York smacks and Block Island boats using hand-lines. Fish are generally abundant.

There are numerous small, rocky patches, without names, but furnishing good cod and haddock fishing, situated to the south and southeast of Block Island, and between that island and Shark's Ledge. The season is the same as for the ledge. Fishing is carried on mainly by Block Island boats.

SOUTHWEST LEDGE OF BLOCK ISLAND.—The center of this ledge lies about three miles southwest by west one-half west from the southwest head of Block Island. It is about two miles long in a northeast and southwest direction, the inner edge being about two miles off the southwest head. The width of the ledge is about one-half mile; depth of water, five to nine fathoms; character of bottom, rocky. This is a good ground for cod and haddock from November to June. It is visited by New York smacks and Block Island boats.

NORTH GROUND OF BLOCK ISLAND lies about one and one-half miles north-northwest of the nun buoy, off the northern end of Block Island, and extends about one mile north and south, and one-half mile east and west. The bottom is rocky and broken. This is a good ground for cod in the spring, and is visited by the same class of boats that resort to Southwest Ledge.

0. NEW YORK TO SOUTHERN FLORIDA.

LONG ISLAND SOUND.

Good sea-bass grounds occur at numerous intervals along the northern side of Long Island, close inshore. Off the eastern side of Gardiner's Island there are many small, rocky spots, which abound in sea bass, and which the fishermen find by means of ranges on shore. Again, from off Brown's Hill, near Orient, to Horton's Point light, in Southold, there are a series of rocky spots, situated at irregular intervals close to the shore, where good sea-bass fishing is found. These spots are mostly eddies on either side of points or small headlands, and have depths of nine to twelve feet. They are of slight extent, seldom more than ten rods in diameter, and are resorted to by small boats from the neighboring shores, principally for pleasure, though to some extent as a regular business. The fishermen go one in a boat. Fleets of ten to fifteen of these boats often collect together on one of these grounds at a time. The most western sea-bass grounds of Long Island Sound are situated off Eaton's Point, near Huntington Bay, in twelve feet of water, with rocky bottom. Blackfish are also found here. Fishing is carried on in the same manner as to the east. The sea-bass season in Long Island Sound is from the middle of June to the last of September.

SCUP and small bluefish, called "snappers," are caught in most of the bays and harbors of Long Island Sound. The latter fish are most abundant in tide-ways. Both species are taken mainly in depths of one to three fathoms, on sandy bottoms, by pleasure parties, but are seldom sought after by professional fishermen.

THE OUTER SIDE OF LONG ISLAND.

MONTAUK POINT GROUND lies between Montauk Point, Long Island, and Great Eastern Rock, with depths of four to seven fathoms and a rocky bottom. This is a cod ground from April 1 to June 1, and is resorted to in the summer for sea bass. Fishing is done with hand-lines only.

NAPEAGUE BEACH GROUND is an inshore cod ground, extending from south of Montauk Point along Napeague Beach, a distance of about ten miles. Fishing is carried on from one-half to one and one-half miles off the beach, on sandy bottoms, in depths of three to eight fathoms, by New York smacks using trawls. The season lasts from the middle of April until the first of June.

EAST HAMPTON GROUND begins off East Hampton, at a distance of three to five miles from shore, and extends westward, parallel with the shore, a distance of eight miles. The bottom consists of sand; the depths range from fourteen to seventeen fathoms. The season and fishing boats are the same as for the last ground.

SHINNICOCK BAY GROUND begins off Shinnicock light, at distances of seven to fifteen miles from shore, and extends parallel with the shore, a distance of about ten miles, to off Moriche's Bay. The bottom is sandy and broken, with depths of sixteen to twenty-four fathoms. This is a winter cod ground, the season lasting from the first of January to May. Fishing is carried on by New York and New England smacks using trawls.

RACCOON WOODS GROUND lies close off Fire Island Beach, about one-fourth of a mile from land, and extends from off Raccoon Woods to Fire Island light, a distance of about seventeen miles. The bottom is sandy; depths, two to five fathoms. This is a spring and fall cod ground, and is visited by New York market smacks using trawls.

FIRE ISLAND OFF-SHORE GROUND.—The center of this ground bears about southeast from Fire Island light; distance, fifteen to eighteen miles. It is about five miles wide and from fifteen to eighteen miles long, extending nearly parallel with the neighboring Long Island shore. The depths range from sixteen to twenty-three fathoms; the bottom consists of sand and gravel, with sea weeds and sea clams. This is a winter cod ground for New York market smacks using trawls.

CHOLERA BANK lies about twelve miles south of Jones Inlet, and is about one mile long, east and west, and one-half mile wide. The bottom is rocky; depth, twelve fathoms. Fall ground for cod; visited by New York market smacks.

MUSSEL RIDGE is situated southeast of Jones Inlet, about one and one-half miles off the beach, and has depths of eight to ten fathoms, with a bottom of sand, mussels, and clams. This is a cod ground in the fall and spring; visited by New York market smacks and small sloops from Jones Inlet.

DILLBERRY GROUND extends westward, parallel with the shore, from three to five miles off Jones Inlet, to off Rockaway Inlet, a distance of fourteen to fifteen miles. The depths of water range from four to ten fathoms; the bottom is sandy, with some rocks. This is a boat fishing-ground for cod in the spring and fall, and some fishing is also done in the winter.

THE COAST OF NEW JERSEY.

ROCKY GROUND lies from twelve to fifteen miles southeast of Highland light, New Jersey, and is about three miles long, southeast and northwest, and one mile wide. Cod are occasionally taken here in the winter, but the principal fishery is for bluefish in the summer. This region is visited by the New York market smacks.

ROCKY SPOTS IN THE CHANNEL are located about eight miles south-southeast from Sandy Hook light-ship, in depths of twenty fathoms. This area is about three miles square, and is mainly valued as a bluefish ground.

FISHING BANK begins southeast of Highland light, about three miles from land, and extends south a distance of about eight miles. Depths, eight to twelve fathoms; bottom, sandy and rocky. This is a good ground for bluefish and sea bass in the summer.

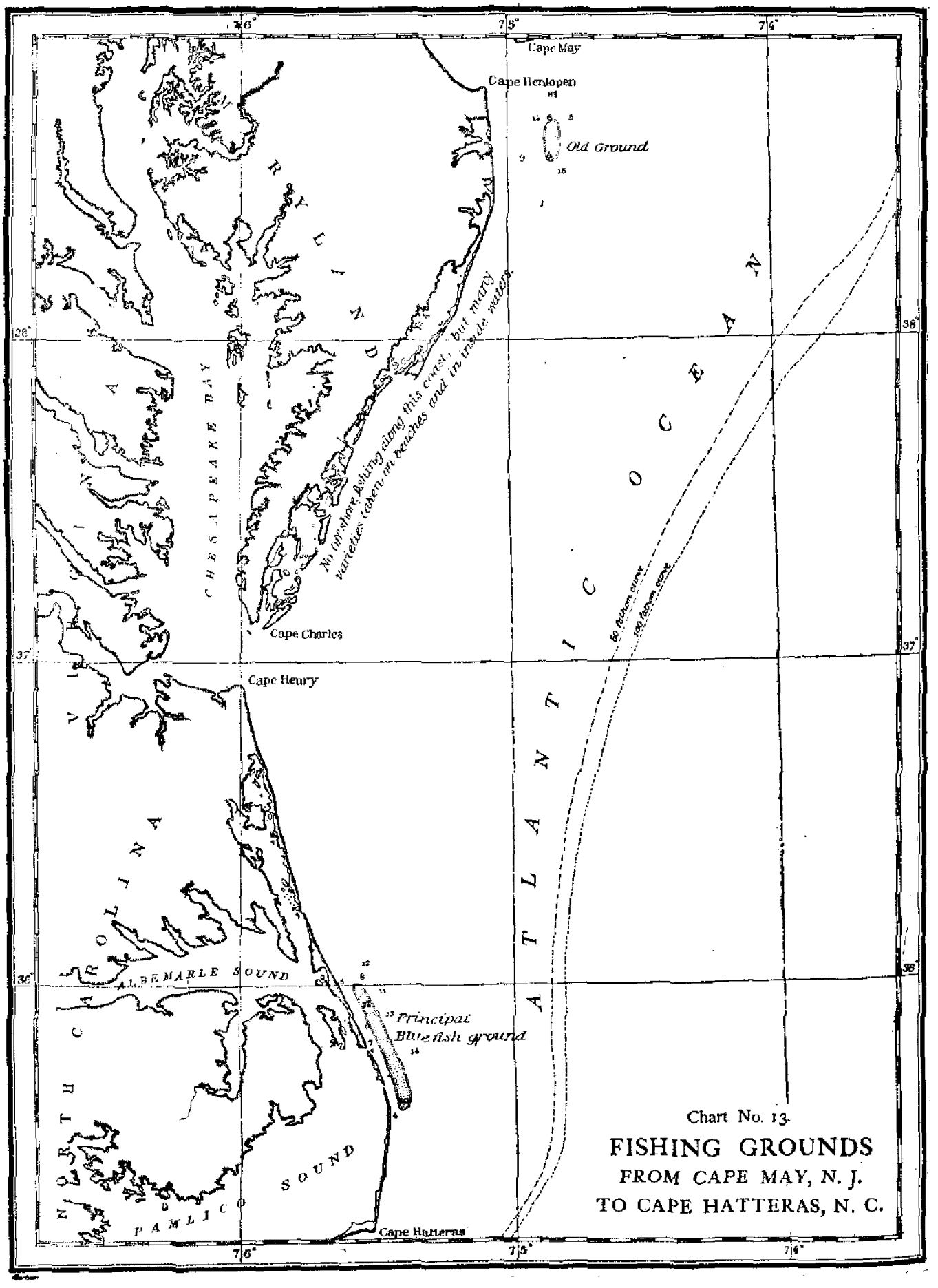
SHARK RIVER GROUND.—The center of this ground bears southeast from Long Branch; distance, six miles. It is about three miles square, with depths of twelve to sixteen fathoms. Cod are found here in the winter and bluefish in the summer.

SQUAN GROUND begins about fifteen miles southeast of Squan, and runs to within five miles northeast of Barnegat light. It is located on the so-called twelve-fathom ridge, where the bottom consists mainly of sand, stones, and mussels. This is a winter ground for cod.

EAST OF BARNEGAT LIGHT.—The center of this ground lies from twelve to fifteen miles east of Barnegat light. It extends about seven or eight miles north and south, and is about three miles broad. The depths of water range from twelve to sixteen fathoms. The bottom is sandy and gravelly, with sea clams. A winter cod ground; visited by New York market smacks.

EGG HARBOR GROUND.—The center of this ground lies fifteen miles southeast of Egg Harbor light. The ground is about fifteen miles long and three miles broad, and extends parallel with the neighboring coast. Depths, twelve to fifteen fathoms; bottom, sandy, with algæ, sea clams, and mussels. A winter cod ground; resorted to by New York market smacks.

ABSECUM GROUND bears south of Absecum light fifteen to eighteen miles to the center of the ground. It extends about seven miles parallel with the coast, and is about four miles broad.


76°
75°
74°
Cape May
Cape Henlopen
Old Ground
No on-shore fishing along this coast, but many varieties taken on beaches and in inside waters.
CHESAPEAKE BAY
VIRGINIA
MARYLAND
ATLANTIC OCEAN
Cape Charles
Cape Henry
NORTH CAROLINA
ALBEMARLE SOUND
Principal Bluefish ground
PAMLICO SOUND
Cape Hatteras
38°
37°
36°
Chart No. 13.
FISHING GROUNDS
FROM CAPE MAY, N. J.
TO CAPE HATTERAS, N. C.

Depths, seven to fifteen fathoms; bottom, sandy and gravelly, with clams. A cod ground; visited by New York market smacks and sloops from Atlantic City using trawls.

TOWNSEND GROUND is a very small clay bank, situated about ten miles east-southeast of Townsend Inlet. It is about ten rods square, with a depth of ten fathoms. This is a good sea-bass ground in the summer; visited by New York market smacks.

HEREFORD GROUND lies about nine miles east of Hereford light. It is about four miles square, with sandy and rocky bottom, and depths of nine to ten fathoms. Sea-bass ground, of the same character as the last.

FIVE-FATHOM BANK lies mostly to the north and east of the buoy, located north of the Five-Fathom Bank light-ship. It extends five or six miles east of the buoy, and one or two miles west of it, and has a width of about three miles. This bank is a series of gullies, the depths ranging from three to ten fathoms, and the bottom consisting of sand, with many mussels. It is a winter cod ground; visited by the New York market smacks.

THE COAST OF DELAWARE.

OLD GROUND.—The cross-bearings to the center of this ground are given as follows: Cape Henlopen, bearing northwest, distant fifteen miles; Indian River, bearing west, distant ten miles. This ground is about eight miles long, north and south, and three miles broad; depths of water, nine to fourteen fathoms; bottom, rocky. It is one of the largest and oldest known grounds of this part of the coast, and the most extensive rocky bottom south of Montauk Point. Cod are taken here in the winter and sea bass in the summer by New York market smacks, and sea bass in the summer by Philadelphia pungies.

SAND-DITCH BAR bears northeast from Kit's Hammock Beach, from which the center is four miles distant, and is two miles long in an east and west direction by one-half mile wide. This is really an oyster-bed, having a depth of eight feet only at low tide, and is visited by local fishermen in summer, for weakfish and other species which frequent these waters.

SOUTHEAST BANK, which is similar to the last in character and in the varieties of fish taken, bears south-southeast from Kit's Hammock Beach; distance, five miles. It is eight miles long in a direction corresponding with the trend of the bay, and half a mile wide. The depth of water at low tide is twelve feet, and the bottom consists of blue clay.

THE COAST OF MARYLAND FROM ISLE OF WIGHT TO CHINCOTEAGUE INLET.

Along this stretch of coast no outside fishing-grounds, properly speaking, occur at any distance from the land; but menhaden, bluefish, and sea mullet are taken on the outer beaches with seines, and drumfish are caught in the same localities with hooks and lines. In the inner waters of Assateague, Sinepuxent, and Isle of Wight Bays quite an extensive seine and gill-net fishery is carried on for striped bass, perch, and various other species of fish.

THE EASTERN COAST OF VIRGINIA FROM CHINCOTEAGUE INLET TO HOG ISLAND.

This coast is low and sandy, with a very gradual slope out under the water, an average depth of seven to eight fathoms only being reached at a distance of five miles from the land. Over this section, however, within seven or eight miles of the land, there are quite a number of shoals, with depths of three and one-half to six fathoms, on which cod are said to occur in the winter. Hook and line fishing, in a small way for home supplies, is carried on in the creeks and inlets of this coast, where fish are plentiful enough to supply a much larger demand. This region also furnishes a good ground for seining menhaden in their season.

THE COAST FROM CAPE CHARLES, VIRGINIA, TO SOUTHERN FLORIDA.

The shores of this coast consist almost entirely of long, sandy beaches and a great number of low, marshy islands, separated by diffusely branching tide channels. These channels sometimes have a considerable width at high tide, but at low water are usually narrow, leaving broad flats exposed. Good fishing-grounds exist along almost the entire coast, but fish are now mostly taken on the sandy shores near the deeper holes and in the various inlets only in the vicinity of the larger towns and cities, as in such localities only can a market be found for the catch. Fish are more abundant in the inlets than on the outer shores. Mullet[1] are taken along the outer and inner shores of both North and South Carolina by fishing crews, who build temporary camps to last only during the fishing season. Bluefish are found along the entire coast, from Cape Cod to Southern Florida, and constitute one of the most important species south of Chesapeake Bay. There are two principal localities where bluefish are taken in gill-nets in the late fall and winter. One of these is situated off Cape May, in the vicinity of Five Fathom Bank. The other is on the coast of North Carolina, beginning a few miles below Cape Henry and extending to Cape Hatteras Inlet.

VICINITY OF CAPE LOOKOUT.—On the south side of Cape Lookout, and within a short distance of the beach, mullet, Spanish mackerel, drum, and sheep's-head abound, and toward the end of the cape large quantities of menhaden are seined. In this vicinity, a fishery for porpoises and whales is also carried on, usually at a short distance from the shore, by means of small boats. In the sound, inside of the outer beach, mullet and several other species of small fish are common in their season.

BEAUFORT HARBOR, NORTH CAROLINA.—At and off the entrance to this harbor there are good bluefishing-grounds in summer. To the eastward of the entrance, along the beach of Shackleford Banks, "sea trout" are seined for in the spring and fall, and drum and mackerel are caught in the fall. Inside of these banks sea trout, sheep's-head, hogfish, and spots are also taken in the fall. West of the entrance, along the outer shore of Bogue's Banks, for a distance of

[1] The scientific names of the several species of fish referred to on pages 52 to 55 are as follows:

Bass	*Sciænops ocellatus.*
Bastard Snapper	*Rhomboplites aurorubens.*
Black Grunt	*Hæmulon formosum.*
Blackfish or Sea Bass	*Centropristis atrarius.*
Bluefish	*Pomatomus saltatrix.*
Butter-fish	*Stromateus alepidotus.*
Cobia	*Elacate atlantica.*
Drum	*Pogonias chromis.*
Grunts	*Hæmulon* (various species).
Hogfish	*Pomodasys fulvornaculatus.*
Jack	*Caranx hippos*, and other carangoids; the name is also applied to the Pompano.
Menhaden	*Brevoortia tyrannus.*
Mullet	*Mugil brasiliensis* and *M. albula.*
Porgees	*Stenotomus aculeatus, &c.*
Red Snapper	*Lutjanus Blackfordii.*
Sailor's-Choice	*Lagodon rhomboides.*
Sea-trout	*Cynoscion maculatum.*
Sheep's-head	*Arctosargus probatocephalus.*
Spanish Mackerel	*Scomberomorus maculatus.*
Spot	*Liostomus obliquus.*
Spotted Bass. (*See* Bass.)	
Squirrel-fish	*Diplectrum fasciculare.*
Tautog	*Tautoga onitis.*
Tom-cod or Kingfish	*Menticirrus nebulosus.*

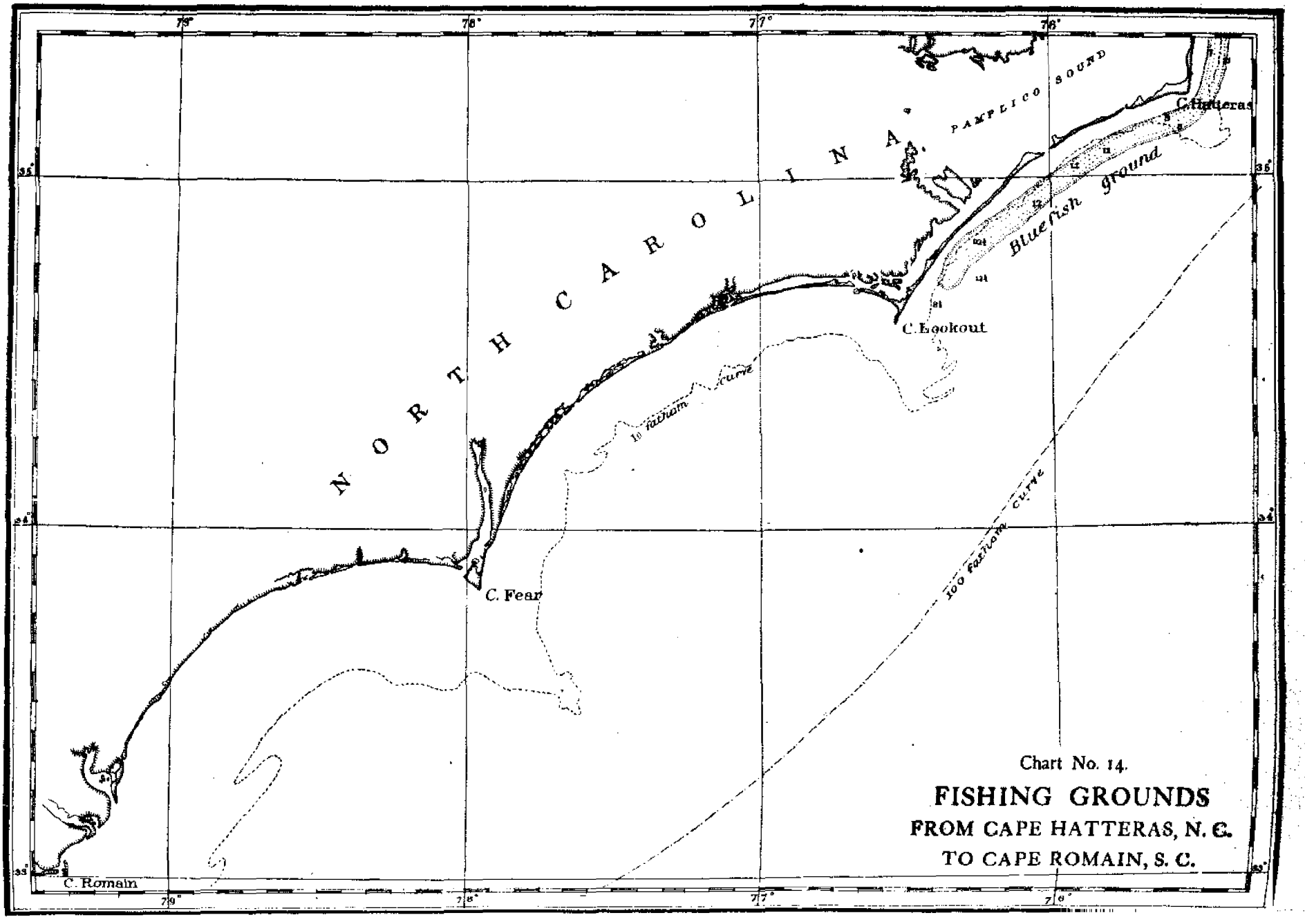
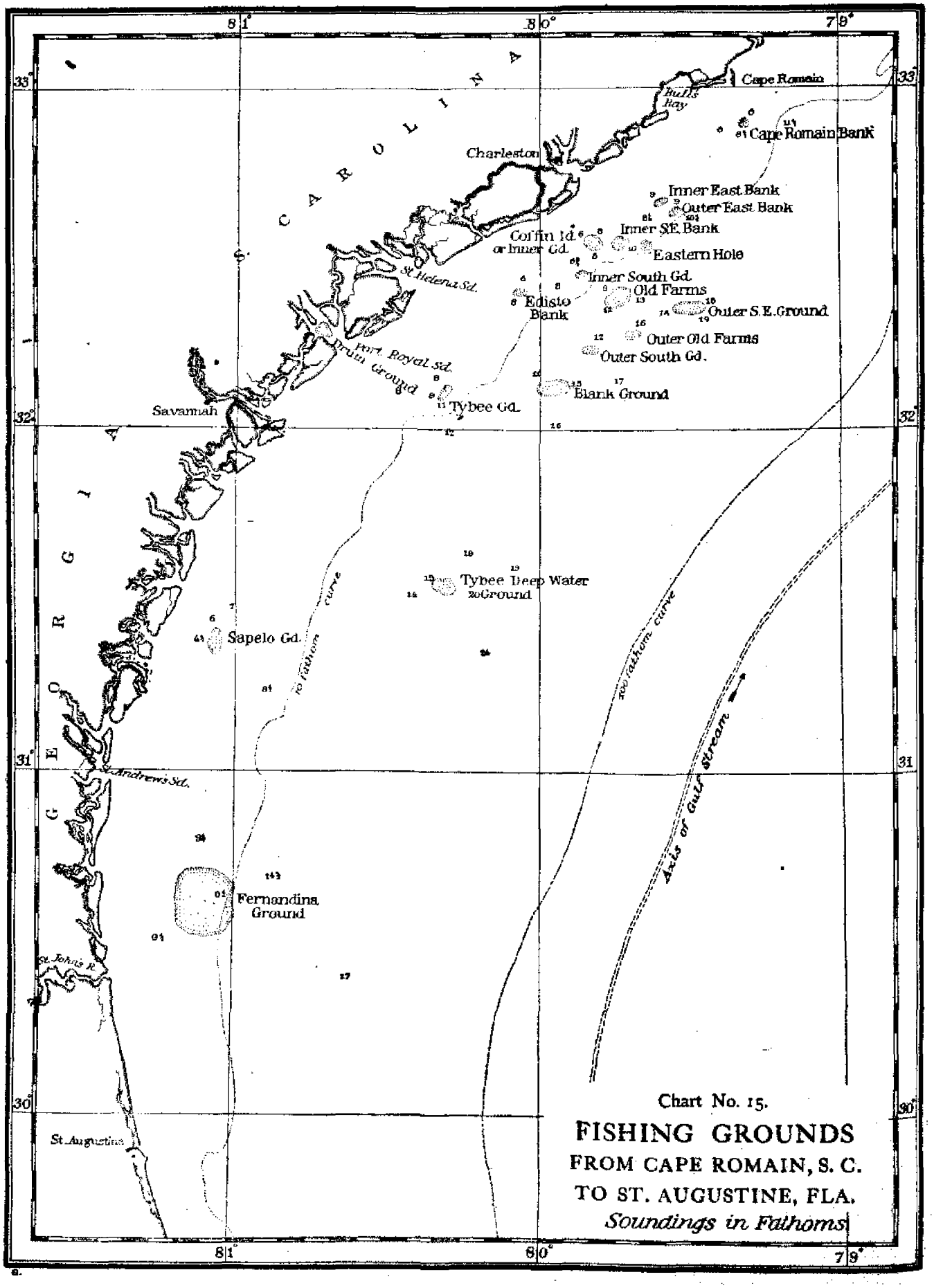


Chart No. 14.

FISHING GROUNDS

FROM CAPE HATTERAS, N. C.

TO CAPE ROMAIN, S. C.


81°
80°
79°
33°
32°
31°
30°
S. CAROLINA
GEORGIA
Cape Romain
Bull's Bay
Cape Romain Bank
Charleston
Inner East Bank
Outer East Bank
Inner SE. Bank
Coffin Id. or Inner Gd.
Eastern Hole
St. Helena Sd.
Inner South Gd.
Old Farms
Edisto Bank
Outer S.E. Ground
Outer Old Farms
Outer South Gd.
Port Royal Sd.
Drum Ground
Blank Ground
Savannah
Tybee Gd.
Tybee Deep Water Ground
Sapelo Gd.
10 fathom curve
100 fathom curve
Axis of Gulf Stream
St. Andrews Sd.
Fernandina Ground
St. Johns R.
St. Augustine
Chart No. 15.
FISHING GROUNDS
FROM CAPE ROMAIN, S. C.
TO ST. AUGUSTINE, FLA.
Soundings in Fathoms

two miles or more from Fort Macon, sea trout are taken in seines in the spring and summer. Inside of Fort Macon they are taken in the fall. Farther west, off the beach, whale-fishing is carried on by small boats from the shore.

VICINITY OF CAPE FEAR, NORTH CAROLINA.—At the entrance to Wilmington River, near Fort Caswell, and along the beach south of the fort, a distance of twelve to fifteen miles, mullet are taken in the fall in haul-seines. North of Cape Fear, along the outer beach and in the waters inside, mullet, sea trout, and several other species of fish abound in their season and are fished for with gill-nets and seines.

VICINITY OF CHARLESTON, SOUTH CAROLINA.—All along the shore, a distance of ten to fifteen miles on both sides of the entrance to Charleston Harbor, mullet seining is extensively carried on in the fall.

THE OFF-SHORE FISHING-GROUNDS OF SOUTH CAROLINA AND GEORGIA.[1]

CAPE ROMAIN BANK.—This is a small, rocky patch, about half a mile square, situated eight miles south-southeast from Cape Romain light, and four miles south by west from the outer shoal buoy. It has a depth of eight fathoms, the bottom consisting of lime rock and gravel with willow corals (Gorgonians) growing upon it. Fish are caught on this ground from June to October, the following varieties being taken, namely: Sea bass, porgees, grunts, bluefish, sharks, a few sailor's-choice, and in October spotted bass which often weigh from thirty to forty pounds each.

INNER EAST BANK bears southeast by east from Charleston light-ship; distance, eight miles. It extends one mile east and west and one-half mile north and south, and has a depth of seven and one-half fathoms. It is frequented by smacks and small boats, the smacks going there from June to December, and the small boats only from June to September. The fishing is done with hooks and lines, and the following kinds of fish are caught: blackfish, porgees, jacks (abundant), and flounders.

OUTER EAST BANK bears southeast by east from Charleston light-ship; distance, eleven miles. It extends one mile east and west and one-half mile north and south, and has eight and one-half to ten fathoms of water upon it, the bottom consisting of coral rock, and yellow sand. The same smacks and boats fish on this bank that visit the Inner East Bank, the season being the same and also the species of fish taken.

EASTERN HOLE bears southeast by east fifteen miles from Charleston light. It is about a mile in diameter, with a depth of twelve fathoms, and a bottom of lime rock, sand, and willow corals. It is fished on by smacks only, from October to April. Sea bass are the fish chiefly caught in the day-time, but at night tom-cod, butterfish, tautog, and a few flounders are also taken.

OUTER SOUTHEAST GROUND bears southeast twenty-seven and one-half miles from Charleston light, and extends five miles east and west and two miles north and south. The bottom is mostly coral rock, with many purple willow corals (Gorgonians). The south side of the ground is covered with large red shells, the east side with bright white sand and white sand mixed with black specks, the west side with shells and sand. The smacks fish here from November to April and May, the catch consisting of sea bass, bastard snappers, red snappers, and jacks.

INNER SOUTHEAST BANK bears southeast ten miles from Charleston light, and extends two and one-half miles east and west and one and one half miles north and south. It has about ten

[1] Frequented by the smack and boat fishermen running to the Charleston markets and elsewhere on that coast.

fathoms of water and a coral bottom. This is a summer fishing-ground, and small boats and smacks visit it from May until August. Porgees, blackfish, red-mouth grunts, black grunts, tautog, sailor's-choice, and cobias are taken. Porgees school here abundantly in August, and about three hundred is considered a fair day's catch; these weigh from three-fourths of a pound to one pound each, and are tied in bunches of five each for sale. The average daily catch of blackfish is two hundred and fifty; of grunts three hundred; but only a few tautog, black grunts, and sailor's-choice are taken. Cobias come in May and remain until July; they drive all other fish away from these grounds. The average daily catch of this species to a man is three.

COFFIN LAND GROUND or INNER GROUND bears south-southeast eight miles from Charleston light, and is three miles long east and west by two and one-half miles wide north and south. The bottom is of coral rock and the depth seven to nine fathoms. Smacks and boats fish on this ground with hooks and lines (the only method pursued on these grounds) principally from April to December. Jacks are caught from April to August, porgees from July to October, and blackfish and sea bass from the first of October to the first of December. The average daily catch to a man of all kinds is about four hundred fish.

OLD FARMS GROUND bears south-southeast eighteen miles from Charleston light, is five miles long east and west by three miles wide north and south, and has a depth of twelve to seventeen fathoms, with a bottom of coral and broken shells. This is a winter fishing-ground and only smacks resort to it. Sea bass, red snappers, and bastard snappers are the principal fish taken from October to April, but, besides these, a few tautog, black grunts, and red-mouthed grunts are caught. The bait used on this and other grounds in the vicinity is blackfish, shark, and squid. The former is the best. The daily catch of fish to a man is about three hundred.

OUTER OLD FARMS GROUND bears south-southeast twenty-five miles from Charleston light, and is three miles long east and west by one and one-half miles wide north and south. The bottom is of coral rock with "willows," and the depth seventeen fathoms. This is also a winter ground for the same kinds of fish that are caught on the Old Farms, and fishing is carried on from October to April.

INNER SOUTH GROUND bears south one-half east from Charleston light; distance, fifteen miles. Its length is one and one-half miles east and west, and its width one-half mile north and south. It has twelve fathoms of water, and an uneven bottom of coral rock and yellow "willows." This is a winter ground, resorted to by smacks only, from December until April. Blackfish, bastard snappers, red snappers, black grunts, porgees, and occasionally sharks, nursefish, and squirrel fish are taken. Bastard snappers are the most plentiful, while the other kinds are generally scarce.

OUTER SOUTH GROUND bears south one-half east, twenty-seven and one-half miles, from Charleston light, and extends two miles east and west and three-fourths of a mile north and south. The depth of water is fourteen and one-half fathoms, and the bottom consists of coral rocks, yellow "willows," and sponges. It is a winter ground, fished on from December to April. The same kinds of fish occur upon it as upon the Inner South Ground.

EDISTO BANK bears southeast by south eleven miles from Edisto Harbor. It is one mile long east and west by one-fourth of a mile wide, and has a depth of eight to ten fathoms. The bottom consists of rocks and shells and on the north side of red sand. Smacks fish here from April to October. The fish taken are sea bass, porgees, red-mouthed grunts, a few jacks, and occasionally a cobia. Sharks (puppy sharks) are so plentiful in June as to stop fishing.

BLANK GROUND bears southwest one-half south eight or nine miles from Outer South Ground, and extends four or five miles east and west and two miles north and south. It has

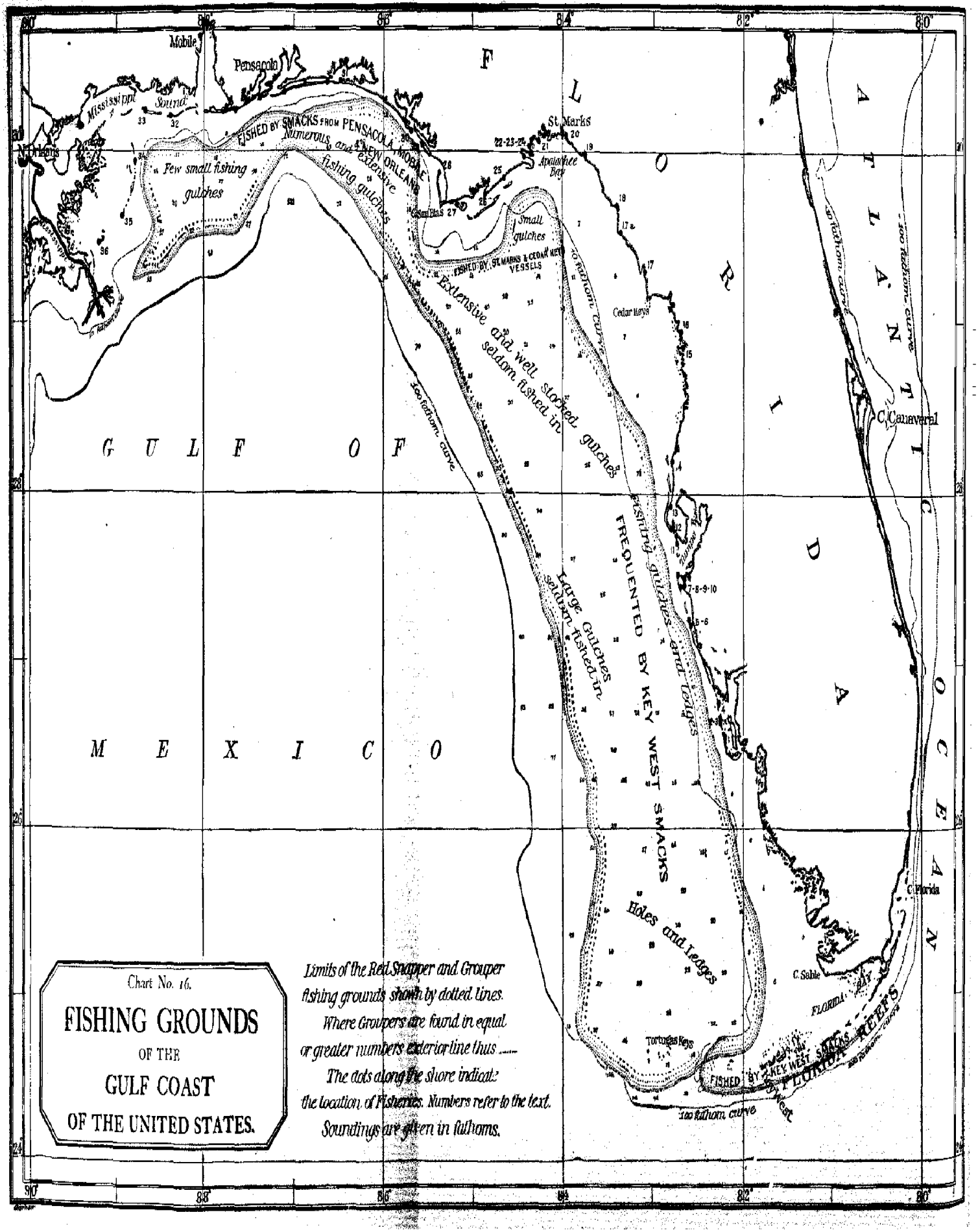


Chart No. 16.

FISHING GROUNDS
OF THE
GULF COAST
OF THE UNITED STATES.

Limits of the Red Snapper and Grouper fishing grounds shown by dotted lines.
Where Groupers are found in equal or greater numbers exterior line thus .....
The dots along the shore indicate the location of Fisheries. Numbers refer to the text.
Soundings are given in fathoms.

fourteen fathoms of water; and the bottom consists mostly of "willows," with some other corals. Fishing is best in January.

TYBEE GROUND bears east one-half north twelve to fourteen miles from Martin's Industry light-ship. It is one and one-half miles long southeast and northwest, and one-half mile wide. The bottom consists of shells and corals, the depth being nine to nine and one-half fathoms. This ground is resorted to by the smacks, from August to January, for blackfish and trout, which are taken to the Charleston market, fifty miles distant.

TYBEE DEEP WATER GROUND bears southeast forty miles from Tybee light-house, and is three miles long northwest and southeast by two miles wide. The bottom consists of corals, "willows," fine sand, and shells, and the depths range from fifteen to eighteen fathoms. Smacks fish here from January to March for blackfish and snappers.

SAPELO GROUND bears east by north from Wolf Island, from which it is ten miles distant. It is four miles long north and south and one mile wide. The bottom consists of corals and shells, and the depth is nine to ten fathoms. Smacks fish here for blackfish and snappers for the Charleston and Savannah markets, from June to January.

FERNANDINA GROUND bears from east-southeast to east by north from Fernandina light-house; distance, fifteen miles. This is a nearly circular ground from seven to ten miles in diameter. The bottom is of corals and is generally broken, the average depth being seventeen fathoms. It is fished on in the winter season for blackfish and other species.

11. THE GULF OF MEXICO.

THE FISHING-GROUNDS OF THE GULF OF MEXICO BELONGING TO THE UNITED STATES.

BY SILAS STEARNS.

The southern and easternmost of the fishing-grounds of the Gulf coast are those of the Florida Reefs, which are mainly visited by the Key West market fleet.

These reefs, as a natural consequence of their coral formation and the protection afforded by their uneven surfaces, are exceedingly well populated with all the forms of invertebrate animals common to this latitude, and, therefore, we find about them an abundance of fishes, attracted by the vast stores of food. On the Gulf Stream side of the keys all forms of animal life exist in greater abundance than on the opposite side, owing probably to the greater depth, clearness, and warmth of the water. In the narrow channels through the reefs, and about solitary rocks and clusters of rocks the best fishing-grounds usually exist, but the kind of fish sought for has much to do with this, for some kinds swim in open water in search of prey, and others along the bottoms of channels, while others again obtain their food from the sides of high-standing rocks and in shoal water.

During warm weather fish abound both outside and inside of the Reef to the south shore of the keys, but during cold "northers," when much of the cold water from Florida Bay is driven through between, and to the south of, the keys, the majority of the fish retreat to the outer side of the Reef, where they can be in the warm water of the Gulf Stream. This movement is particularly noticeable with the kingfish (*Scomberomorus regalis*), and it is during such cold spells that the largest catches of this species are made, for they are then congregated within narrow limits. The kinds of fish commonly taken on these grounds are as follows:

Carangus hippos. Jackfish.
Paratractus pisquetus. Horse-eye Jack.
Decapterus punctatus.
Enneacentrus punctatus. Coney.
Sarothrodus bimaculatus. White Angel-fish.
Holacanthus ciliaris. Yellow Angel-fish.

Seriola punctatus. Amber-fish.
Hæmulon punctatus. White Grunt, Yellow Grunt, Black Grunt.
Lutjanus caxis. Gray Snapper.
Lutjanus Blackfordii. Red Snapper.
Lutjanus Stearnsii. Mangrove Snapper.
Mesoprion uninotatus (?). Schoolmaster Snapper.
Ocyurus chrysurus. Yellow-tail Snapper.
Trisotropis brunneus. Black Grouper.
Trisotropis falcatus. Grouper.
Trisotropis undulosus. Rockfish.
Epinephelus morio. Red Grouper.
Epinephelus striatus. Nassau Grouper.
Epinephelus nigritus. Jew-fish.
Epinephelus Drummond-Hayi. Deer Grouper, Hind.
Holacanthus tricolor. Black Angel-fish.
Sparus pagrus. Porgee, Margate fish, Goat's-head Porgee, Sheep's-head Porgee.
Scomberomorus regalis. Kingfish or Cero.
Scomberomorus maculatus. Spanish Mackerel.
Scomberomorus caballa. Kingfish or Cero.
Sphyræna picuda (?). Barracuda.
Lagodon rhomboides. Sailor's-Choice.
Lachnolæmus falcatus. Hogfish.
Sciænops ocellatus. Channel Bass.
Centropristis atrarius. Sea Bass.
Balistes capriscus. Turbot.
Pomatomus saltatrix. Bluefish.
Menticirrus alburnus. Whiting.
Cyphosus Boscii. Brim.

Proceeding northward in the Gulf from the Florida Reefs fishing-grounds, we find innumerable places for sea-fishing, which follow one another so continuously from the Tortugas Keys to the mouth of the Mississippi River, that the entire region can be best described as an extensive fishing-ground in the form of a broad belt following the general contour of the coast.

The character of the southern portion of these grounds, from about the latitude of Anclote Keys southward, is different from that of the northern portion in some respects. The bottom at the south seems to consist of a more recent formation than at the north; there is less sand and mud, and fish occur near to and among the ledges which stand up from the deposit of sand and shells.

Along the coast from Anclote Keys to Charlotte Harbor there exist extensive and continuous lines of ledges, upon which, as well as in the gullies between, fish abound. The same kind of bottom is again found just north of the Florida Reefs, but between the two regions there is an almost barren waste of sand.

The fishing-grounds on the off-shore limit of this section are, so far as known, in the gullies between the rocks where there are living corals, or else in gullies in sandy and shelly bottoms also containing living corals and a soft rock formation.

The grounds of the northern portion, embracing the region between Anclote Keys and the mouth of the Mississippi River, are wholly in gullies. The bottom off to a depth of about twenty fathoms generally consists of sand with an admixture of broken shells, but in the gullies, which vary from one hundred to one thousand yards in width and from one-fourth of a mile to several miles in length, the bottom is covered with living and dead corals or hard rock. Outside of about twenty fathoms, rocky and coral bottom predominates, and the soundings show it to be very uneven. At some places in this northern portion the small gullies or gulches are found quite near to the coast, as, for instance, off Appalachee Bay, Dog Island, and Crooked Island, off the coast between Saint Andrew's and Choctawhatchee Bays, and off Pensacola, where they occur in from five to ten fathoms of water.

The deepest waters in which fishing is carried on in the Gulf of Mexico are off Pensacola, in a southeast direction and in a depth of nearly fifty fathoms.

Just east of the Mississippi River and off Mississippi Sound there are a few small gulches inshore, which were formerly resorted to, but are not fished on now.

The general character of the bottom in this section is muddy, and it is possible that the

sediment from the Mississippi River is filling up the fishing-holes near by. West of the Mississippi, off the coasts of Louisiana and Texas, the bottom is also muddy. Several fishing schooners from Pensacola have carefully explored this region and have found but two or three small patches of hard bottom. These yielded a few fares of red snappers and were left for the time as almost barren. Since they are in shoal water (10 to 20 fathoms) it is probable that they are inhabited only in summer when the water is warm, and even then only to a slight extent.

On the grounds of the southern portion or district, as I have classed it, the majority of the edible fish taken are groupers, chiefly the red and black groupers (*Epinephelus morio* and *Trisotropis brunneus*) while the red snappers are much less abundant. On the northern grounds it is just the opposite, red snappers being more numerous and groupers much less common. Other kinds of fish are often caught, many of which are not salable. The most common of these are as follows, those marked with an asterisk not being eaten:

Balistes capriscus. Leather Jacket or Turbot.*
Epinephelus Drummond-Hayi. Hind.
Epinephelus nigritus. Jew-fish, Warsaw.
Echencis naucrateoides. Suckerfish.*
Lutjanus Stearnsii. Mangrove Snapper.
Sparus pagrus. Porgee.
Centropristis atrarius. Sea Bass.
Rhomboplites aurorubens. Bastard Snapper.
Lagocephalus lævigatus. Bottle-fish.*
Sciænops ocellatus. Channel Bass, Redfish.
Batrachus taupardus. Sea Robin.*
Seriola bonariensis. Rock Salmon.
Seriola Stearnsii. Amber-fish.
Trisotropis falcatus. Scamp.
Several species of sharks.*

The off-shore fishing-grounds, off Cedar Keys, where red-snappers, groupers, and such fishes can be caught, lie over thirty miles in a westerly direction from Cedar Keys. From there, by following the deepest water on a southeast or a northwest course, fish are found in abundance, until shoal water is reached, either off Tampa Bay or off Cape Saint George. On these banks groupers, especially the red grouper, are found in greater abundance than to the westward, anywhere between Cape Saint George and the Mississippi River; and, on an average, two-thirds of the catch will be groupers and one-third snappers. On the bottom there is a greater deposit of lime rocks, and probably more living corals, etc., than in the Pensacola Bight, which explains the causes of their abundance.

Along the entire coast there is a tendency among these fishes to move from the shoaler water to off-shore grounds at the approach of cold weather. During mild winters they remain inshore, but during severe seasons they are not to be found there.

The fishermen prefer to take fish from shoal water, as it is less laborious than deep-water fishing, and the fish taken there are much hardier and better able to bear transportation alive in vessels' wells than those from very deep water. The consequence is that the grounds of the deep-water regions are not much explored, and it is probable that the most important store of food-fishes of the Gulf has not yet been drawn upon.

The seining flats are smooth sand-bars lying in the thoroughfares of schooling fishes, and conveniently located for drawing the seines ashore. Such places are not common along the coasts of

southwestern Florida, and of Louisiana and Texas, where the shores are mainly uneven and marshy, but where they do occur fishing establishments are formed each season. In the regions most convenient to markets nearly all the favorable seining flats have been secured by fishermen or fishing firms, who build permanent houses and wharves for the prosecution of their business.

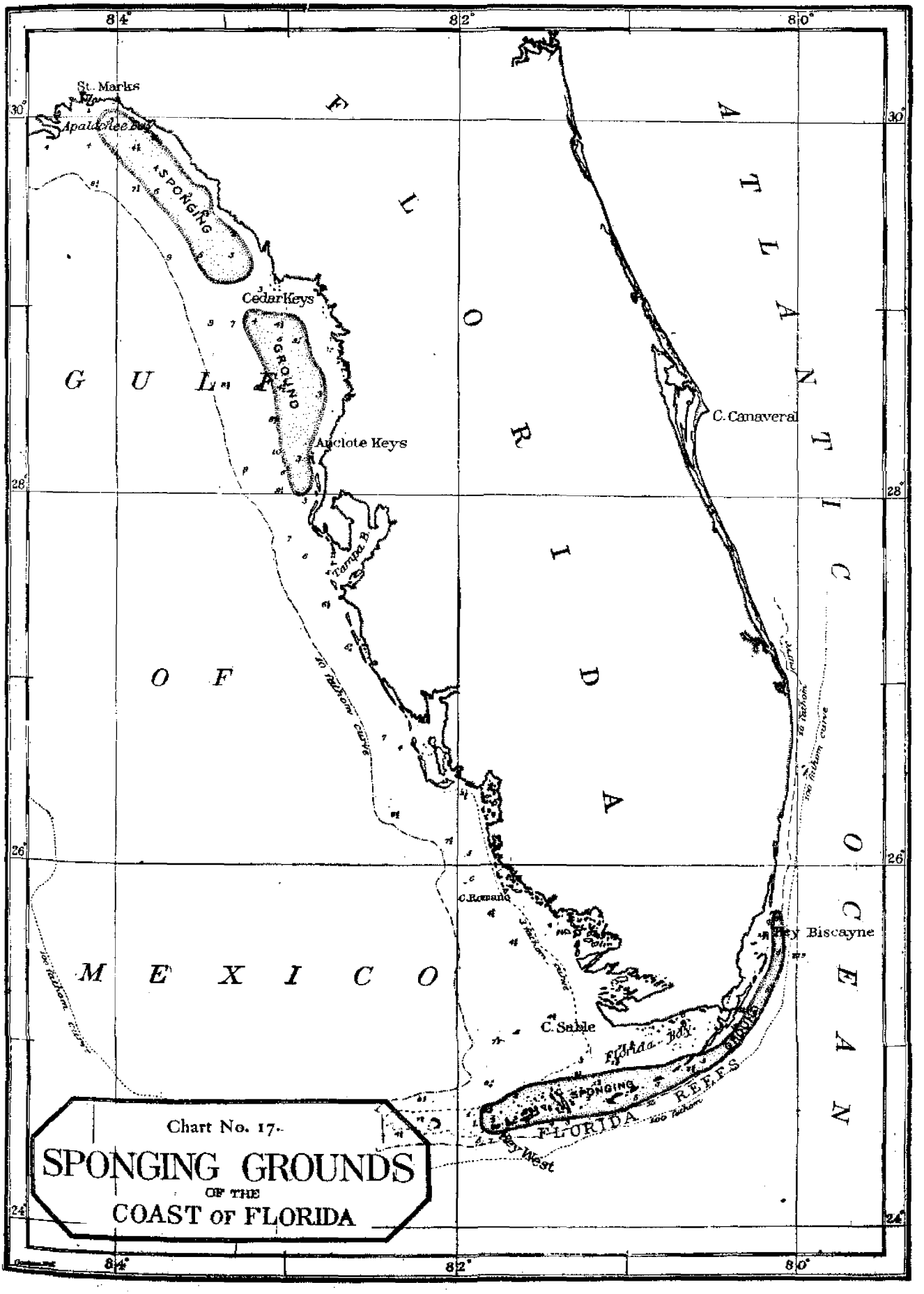
At other and more remote points, temporary shanties, generally constructed from palmetto leaves, are built, which are occupied one year by one crew and the next year by another, according to whichever reaches the locality first. Those nearest the markets are the most used and have the most elaborate and complete outfits. Probably in the course of a few years all suitable sites will have been secured. Usually they occur near the entrances to bays or rivers, or on islands or projecting points of land—places where schools of fishes coming from, or going to the sea, must approach near the shore.

The region from Appalachee Bay to the mouth of the Mississippi River has an almost unbroken shore that is suitable for seining. As a result, there are few permanent stations, and the fishing is carried on from small vessels and boats that accommodate the crew and their catch while on short trips from the nearest markets.

THE FLORIDA SPONGE GROUNDS.

The Florida sponging-grounds form three separate and elongate stretches along the southern and western coasts of the State. The first includes nearly all the Florida Reefs; the second extends from Anclote Keys to Cedar Keys, and the third from just north of Cedar Keys to Saint Mark's, in Appalachee Bay. The Florida Reef grounds have a linear extent of about one hundred and twenty miles, beginning near Key Biscayne, in the northeast, and ending in the south, at Northwest Channel, just west of Key West. The northeastern half of the grounds are very narrow, having an average width of only about five miles, and being limited to the outer side of the reefs. At about the Matacumbe Keys the grounds broaden out so as to cover the entire width of the reefs, which are much broader here than at the north. The entire southern half of the grounds have more or less the same breadth, which is about thirteen or fourteen miles. The second sponge-ground begins just south of Anclote Keys, with a breadth of seven or eight miles, but rapidly broadens out toward the north to a width of fifteen miles, which it maintains from a point about opposite Bay Port to Sea Horse Reef, just south of Cedar Keys. The total length of this sponging-ground is about sixty geographical miles. Its distance from the shore varies somewhat; at the south the inner edge approaches within four or five miles of the mainland, and comes close upon Anclote Keys; but throughout the remainder of its extent it is distant from six to eight miles from the shore, until it touches the shallow bottom and reefs of Cedar Keys. The depth of water on these grounds, as indicated on the Coast Survey charts, ranges from three to six fathoms, but many portions are undoubtedly shallower than this. The northern sponging-ground, which maintains a nearly uniform width throughout, is about seventy miles long by about fifteen miles broad. It approaches to within about five miles of the shore, and terminates just off the mouth of Saint Mark's River. The depth of the water upon these grounds is the same as upon the next one to the south—from three to five fathoms.

The total area of the Florida sponging-grounds, which are now being worked upon, including also those which were formerly fished but have since been more or less abandoned, may be roughly stated at about three thousand square geographical miles. This does not, however, probably indicate the entire extent of the sponging-grounds of the Florida waters, for the fact that new grounds are being constantly discovered would indicate that there might still be more to find, and it is certain that no very strenuous efforts have yet been made to extend the already known grounds, the discovery of new sections generally having been made by accident.


84°
82°
80°
30°
28°
26°
24°
St. Marks
Apalachee Bay
SPONGING
Cedar Keys
GROUND
Anclote Keys
Tampa B.
C. Canaveral
C. Romano
Key Biscayne
C. Sable
Florida Bay
SPONGING
FLORIDA REEFS
Key West
FLORIDA
GULF OF MEXICO
ATLANTIC OCEAN
Chart No. 17.
SPONGING GROUNDS
OF THE
COAST OF FLORIDA

LIST OF THE FISHING-STATIONS ON THE GULF COAST OF THE UNITED STATES.

BY SILAS STEARNS.

[The numbers refer to the chart prepared by Mr. Silas Stearns to show the fishing-grounds of the Gulf coast of the United States.]

No. 1. CAPTIVA FISHERY.—Situated upon the north end of Captiva Island, mouth of Charlotte Harbor. Consists of temporary palmetto shanties, occupied only through the fall for the purpose of salting mullet for the Cuban markets.

No. 2. SPANISH FISHERY.—Situated at Lacosta Island, near the main entrance to Charlotte Harbor. Includes several buildings, mostly permanent, occupied in the fall for the mullet fishery. Spaniards from Key West carry on this fishery.

No. 3. SPANISH FISHERY.—Situated near No. 2 and similar to it.

No. 4. GASPARILLA FISHERY.—Situated upon Gasparilla Island, mouth of Charlotte Harbor. Several permanent shanties, owned by the Messrs. Peacons, of Key West, who salt mullet for the Cuban trade in the fall.

No. 5. SARASOTA FISHERY.—At the north end of Little Sarasota Island and on the Big Sarasota Pass. Mullet are salted for Cuban markets at this station in the fall. Temporary shanties.

No. 6. SARASOTA FISHERY.—Near the last. Occupied in 1879 for salting mullet for the Florida trade. Temporary shanties.

No. 7. HUNTER'S POINT FISHERY.—Situated upon Hunter's Point, the dividing line between Sarasota and Palmasola Bays. Mullet salted for Cuban markets. Buildings permanent and the best arranged on the coast. Owned by Sweetzer & Thomson.

No. 8. PALMASOLA SMALL FISHERY.—Situated on the back side of Palmasola Bay. Small permanent shanty, occupied each fall by gill-net and cast-net fishermen, who salt mullet for home trade.

No. 9. PALMASOLA FISHERY.—Near the last. Occupied by seining-crews every year for the purpose of salting mullet for home trade. A permanent palmetto shanty.

No. 10. PALM KEY FISHERY.—On the north end of Palm Key. Occupied sometimes by Key West fishermen and in 1879 by Appalachicola fishermen. This is a good station for mullet in the fall. Contains temporary shanties.

No. 11. PASS À GRILLE FISHERY.—On Long Key, in Boca Ceiga Bay. A station for catching and salting mullet during the fall months. Not occupied every year. The catch is usually sent to Cuba. The shanties are temporary ones.

No. 12. TURTLE-CRAWL POINT FISHERY.—At Turtle-Crawl Point, Boca Ceiga Bay. A mullet fishery, where fish are salted for the Florida trade. Small temporary shanties, not regularly occupied.

No. 13. KILGORE'S FISHERY.—On the passage from Boca Ceiga Bay to Clear Water Harbor. Mr. Kilgore salts fish during the fall for the country trade, and has permanent buildings near his house for the work.

No. 14. ANCLOTE RIVER FISHERY.—Situated at the mouth of the Anclote River. Parties are stationed here in the fall to catch mullet, which are sold in Florida. Appalachicola crews occupied it in 1879. Permanent shanty.

No. 15. CRYSTAL RIVER FISHERY.—At the mouth of Crystal River. A station occupied each fall by parties from the neighboring country or from Cedar Keys, engaged in the mullet fishery. Temporary shanties.

No. 16. CHAMBERS MILL FISHERY.—On the coast, a few miles north of the mouth of the

Crystal River. Mullet are caught here in the fall for Cedar Keys and the country trade. The buildings used are those of an abandoned saw-mill.

No. 17. SUWANNEE RIVER FISHERY.—At the mouth of the Suwannee River. Seining crews fish here for mullet in the fall to supply the country trade and sometimes for that of Cedar Keys. Temporary shanties.

No. 17*a*. PINEY POINT FISHERY.—On Piney Point, between Suwannee and Steinhatchee Rivers. Similar to the last. One permanent building.

No. 18. STEINHATCHEE RIVER FISHERY.—At the mouth of the Steinhatchee River. A mullet fishery for country trade. No buildings.

No. 19. FENHOLLOWAY RIVER FISHERY.—At the mouth of the Fenholloway River. Mullet fishing for country trade. Temporary shanties.

No. 20. OCILLA RIVER FISHERY.—At the mouth of the Ocilla River. Carried on for mullet in the fall. Catch sold in the country. Temporary shanties.

No. 21. SHELL POINT FISHERY.—A few miles west of the Saint Mark's River. Occupied in the fall by crews who salt mullet for country trade. Permanent shanties.

No. 22. OYSTER BAY FISHERY.—Carried on for mullet, which are sold to country customers. Seines and gill-nets are used. Buildings permanent.

No. 23. DICKERSON BAY FISHERY.—Same as the last. Buildings permanent.

No. 24. OCKLOKONY BAY FISHERY.—At the mouth of Ocklokony Bay. Same as Nos. 22 and 23. Permanent buildings.

No. 25. CROOKED RIVER or PICKETT'S FISHERY.—Occupied in the fall for mullet fishing. Catch sold, salted, at Appalachicola. Permanent shanties.

No. 26. CAT POINT FISHERY.—A station sometimes occupied by Appalachicola parties. Temporary shanties.

No. 27. INDIAN PASS FISHERY.—A gill-net station, occupied in the fall by Appalachicola crews. Permanent palmetto shanties.

No. 28. SAINT JOSEPH'S POINT FISHERY.—Occupied in the fall by Saint Andrew's Bay and Appalachicola crews, while salting mullet and other fishes, and in the spring to catch pompano, which are salted or sent to Pensacola fresh. They have several permanent palmetto shanties.

No. 29. CROOKED ISLAND FISHERY.—A station on the north end of Crooked Island, where Saint Andrew's Bay crews fish in the fall and spring, to catch pompano, mullet, sheep's-head, redfish, etc. Temporary shanties or tents.

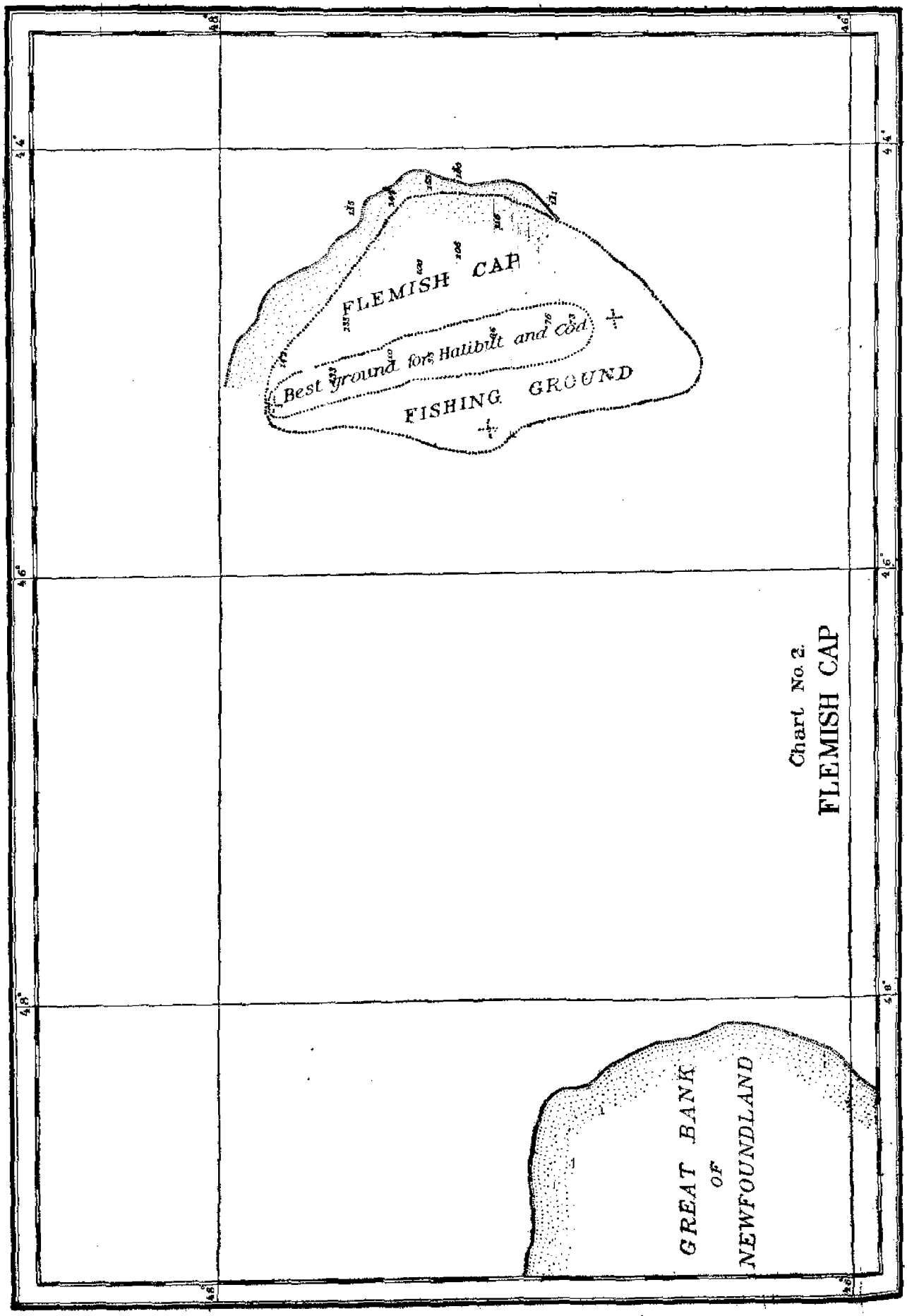
No. 30. SAINT ANDREW'S POINT FISHERY.—On the west point at the entrance to the bay, a station used by people of Saint Andrew's Bay for the same purpose as the last. Temporary shanties, and one permanent one.

No. 31. CAPT. LEN. DESTIN'S FISHERY.—At the Choctawhatchee or Santa Rosa Bay Inlet, Captain Destin has fish-house, ice-house, and very complete arrangements. He fishes nearly all the year, chiefly for pompano, and sends the catch to Pensacola in ice, also salts a few barrels annually for country trade. This is the most important pompano fishery in the Gulf.

No. 32. PETIT BOIS FISHERY.—On the island of that name, outside of Mississippi Sound, a station occupied nearly all the year by Mobile and New Orleans seine and gill-net fishermen. Fish sold fresh.

No. 33. HORN ISLAND FISHERY.—On Horn Island, outside of Mississippi Sound. A station similar to No. 32. Fish sold fresh. Permanent buildings for habitation.

No. 34. CHANDELEUR ISLANDS, No. 35. GRAND GOSIER ISLAND, and No. 36. ISLE BRETON, are all prominent stations for seine and gill-net crews from New Orleans, who resort to them at intervals through the year. No fish are salted at these places.


FLEMISH CAP
Best ground for Halibut and Cod
FISHING GROUND
GREAT BANK
OF
NEWFOUNDLAND
Chart No. 2.
FLEMISH CAP

12. THE OFF-SHORE BANKS, INCLUDING THE GRAND BANKS.

THE FLEMISH CAP.

The Flemish Cap is the outermost of the Great Newfoundland Fishing Banks, as it is also the least perfectly known. The Admiralty chart locates its eastern end by three lines of soundings extending about northeast and southwest, but of its western limit absolutely nothing is known. The center of the series of soundings given on the chart lies about one hundred and fifty miles east-northeast of the northeastern part of the Grand Bank. Less than one-half of the intervening area between these two banks has yet been sounded, so far as indicated on the published charts, and the soundings off the northeastern end of the Grand Bank show depths of sixty to one hundred and forty-five fathoms only. There is, therefore, a possibility that the Flemish Cap extends much nearer to the Grand Bank, and has a much greater area than is indicated on the charts of the region, and it is even probable that this outlying shoal is a direct continuation northeastward of this same large bank. Combining the soundings of the Admiralty chart with information gathered from the Gloucester fishermen, who have visited this region, it would appear that the known area of the Flemish Cap was irregularly elongate in outline, the longer axis extending about north and south.

This area lies between the parallels of 46° 50′ and 48° north latitude, and the meridians of 44° 06′ and 45° 25′ west longitude, the greatest length being, therefore, seventy geographical miles, and the greatest width fifty-six miles. Its extent is about two thousand seven hundred and fifty square geographical miles. The soundings range from seventy-three to one hundred and fifty-five fathoms, the least depth being located near the center and the southern parts of the bank, and the deepest water occurring on the eastern edge. Beyond this, to the eastward, no depths were reached by the vessels making the survey of this region, but the sounding line they used appears to have had a total length of only about one hundred and sixty fathoms.

The bottom is composed of mud, sand, gravel, pebbles, and rocks, distributed in patches of variable extent and character. In the localities resorted to by vessels from the United States the prevailing bottom is often a slaty rock, apparently *in situ*, and forming a smooth surface, on which the anchor often fails to take a firm hold.

Cod and halibut are the only fish that have been sought for on the Flemish Cap. Nothing is known about their abundance in the winter, as the bank can only be visited in the spring and summer (April to August at the most). But often during the spring the weather is so rough that fishing can be carried on only a small part of the time, and after June the region is so much infested with ground-sharks that the trawls are rapidly destroyed. Another danger frequently arises from the presence of icebergs, which are often abundant. All of these causes combined have deterred fishermen from frequenting this bank, which, so far as known, has only been visited for cod and halibut by a few vessels from Gloucester during the past few years.

The region thus far resorted to for cod lies mainly within a distance of ten to fifteen miles of 47° north latitude and 45° west longitude. In one or two instances, however, large catches of cod as well as halibut have been obtained from eighteen to twenty miles west of the forty-fifth meridian in 47° north latitude. According to the statements of the fishermen most familiar with these grounds, no trouble is ever experienced in obtaining large quantities of medium-sized cod, which are, however, below the standard recognized in the United States markets. Larger fish are less common, although taken in considerable numbers, and very successful fares have occasionally been made. The general opinion is that while fish are sufficiently abundant, no

great dependence can be placed on securing a profitable trip, on account of the several hindrances alluded to.

The best known halibut grounds of the Flemish Cap are said to be located near the meridian of 45° west longitude, between the parallels of 47° 30′ and 47° 50′ north, where the bottom consists of rocks, pebbles, and coarse gravel. The only vessels that have visited the Flemish Cap have been those engaged in the salt halibut and cod fishery.

THE GRAND BANK.

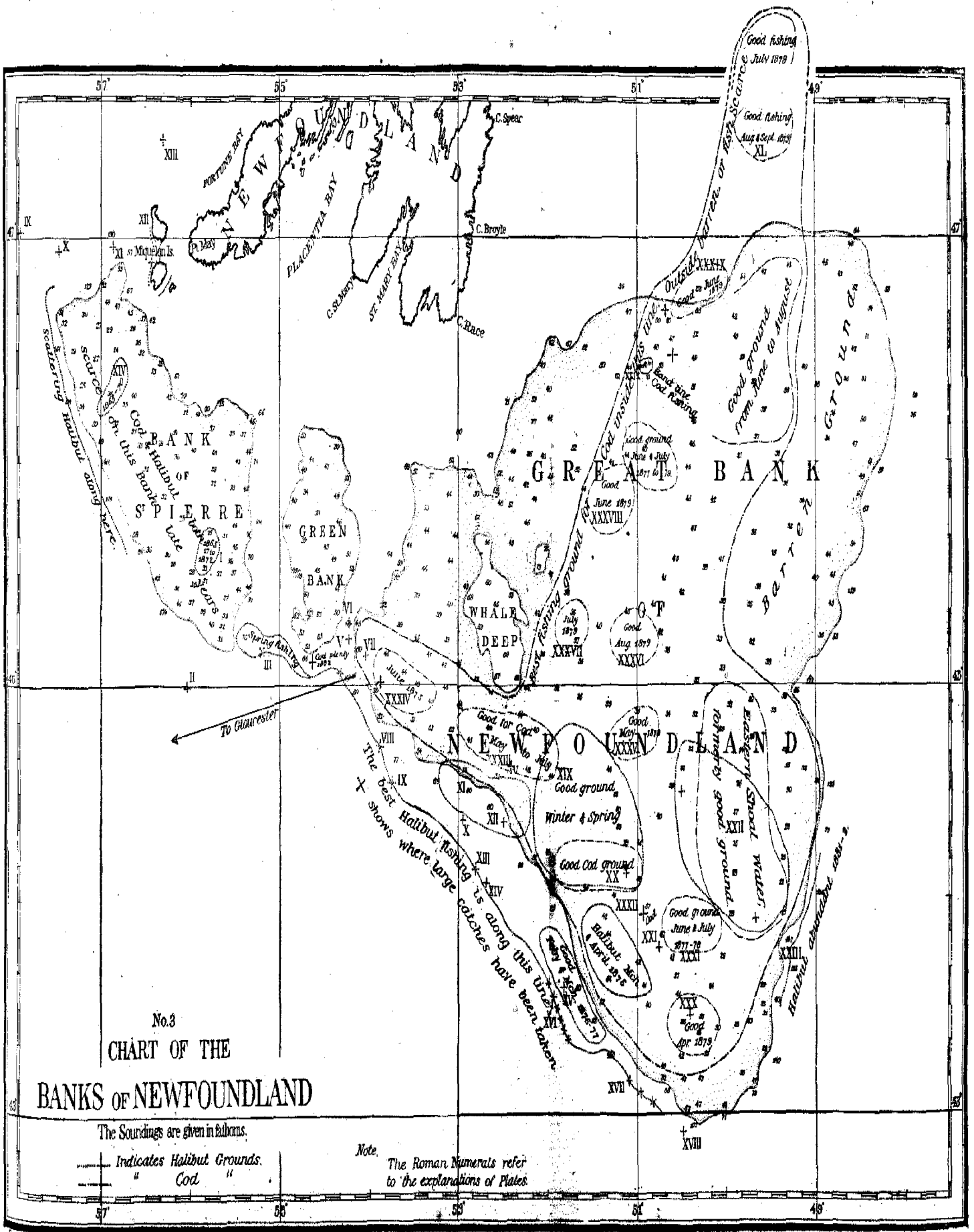
This immense fishing-ground, which lies southeasterly from Newfoundland, is of about the same size as that British province, and equals in extent all of the other off-shore fishing-banks of the eastern coast combined. Its area, within the sixty-fathom limit, is about thirty-seven thousand square geographical miles. It extends over more than four degrees of latitude from 42° 57′ to 47° 04′ north, and over nearly six degrees of longitude, from 48° 06′ to 54° 11′ west, and has an irregularly triangular outline, one side facing north-northwest, another southwest, and the third about east by south. The northwestern and eastern sides are each about two hundred and sixty-four miles long in a straight line, and the southern side about two hundred and twenty-five miles long.

The most remarkable shoals are the Virgin Rocks and Eastern Shoal Water, located near the center of the northern part of the banks. The channel separating the bank from Cape Race has a width of about thirty-six miles. Considered both as to its area and the extent of its fisheries, the Grand Bank is undoubtedly the most important fishing-ground of the world.

In order to describe its somewhat varied characteristics in sufficient detail, we have, for the sake of convenience, divided the area of the bank into several arbitrary sections suggested by their importance as fishing grounds.

South of 44° north latitude the depths range from twenty-five to fifty-three fathoms, and the bottom consists almost entirely of fine sand, varying somewhat in color. Over the east and west portions of this section there are, however, a few scattered patches of coarse sand and gravel with an admixture of small pebbles, and occasionally of rocks of larger size. The eastern edge drops off rapidly at a distance of a mile or more from the sixty-fathom limit, but halibut have been found there abundantly in depths of one to three hundred fathoms. On the western side of the slope the descent is apparently more gradual, especially north of the parallel of 44° north latitude, where a depth of one hundred and fifty fathoms is found at a distance of twenty-five miles or more from the edge of the bank. Over the greater part of this area there occur large numbers of bank quahogs (*Cyprina islandica*), bank clams (*Siliqua costata*), periwinkles (*Buccinum*), and small crustacea, and wherever the bottom is pebbly, sea anemones, sea pumpkins or holothurians, and sea lemons (*Boltenia*) abound, and crabs are generally plentiful. Owing to the strong currents that sweep by the eastern edge, and the frequent occurrence there of large icebergs, fishing in that locality is attended with many difficulties and some danger.

Another section may be laid out between the parallels of 44° and 45° 20′ north latitude, and extending the entire width of the bank. The eastern part of this section, in the vicinity of and to the eastward of the meridian of 50° west, is generally known as the "Eastern Shoal Water." It has depths of twenty-two to thirty-five fathoms, and the bottom is mainly composed of fine sand, with an admixture of gravel, pebbles and large stones over certain areas. The eastern edge descends rapidly into comparatively deep water. The fauna of this section resembles that of the southern section already described. Between 50° and 51° west longitude lies what is known among fishermen as the "pumpkin bottom," from the immense quantities of a large


NEWFOUNDLAND
C. Spear
C. Broyle
C. Race
C. St. Mary
St. Mary Bay
Placentia Bay
Fortune Bay
Pt. May
Miquelon Is.
GREAT BANK
BANK OF ST PIERRE
GREEN BANK
WHALE DEEP
Good fishing July 1879
Good fishing Aug. & Sept. 1879
Outside barrier of ice & scarce
Good ground from June to August
Cod inside this line
Bank side Cod fishing
Good ground June & July 1877 to 79
Good June 1879
Good Aug. 1879
Good May to July
Good ground Winter & Spring
Good Cod ground
Good ground June & July 1877-78
Halibut ground April 1875
Good Apr. 1879
Halibut abundant 1881-2
Scattering Halibut along here.
Scarce on this Bank Cod & Halibut late years
Spring fishing
To Gloucester
The best Halibut fishing is along this line. X shows where large catches have been taken
No. 3
CHART OF THE
BANKS OF NEWFOUNDLAND
The Soundings are given in fathoms.
Indicates Halibut Grounds.
" Cod "
Note. The Roman Numerals refer to the explanations of Plates.
57° 55° 53° 51° 49°
47° 46° 45° 43°

holothurian found there. The depths vary from thirty to thirty-eight fathoms, with a bottom of sand, gravel, pebbles, and smooth, round rocks. In addition to the holothurians, large numbers of star-fishes, periwinkles, crustaceans, bank quahogs, and bank clams also occur. West of 51° west longitude and north of 44° 20′ north latitude, in this section, the depths range from thirty-six to fifty-five fathoms, the latter soundings occurring only along the edge of the bank. The bottom is mostly rocky, the rocks being much perforated with a species of boring mollusk. The fishermen's hooks frequently catch in these holes and large fragments of the rock are in this manner often brought to the surface.

Besides many of the lower forms of animal life common to other sections of the Grand Bank, this area especially abounds in crabs and shrimps, and many specimens of octopus have been taken from the stomachs of fish captured here. To the westward of the sixty-fathom line, the bottom slopes more or less gradually to a depth of two hundred fathoms, which it reaches at a distance of ten to fifteen miles from that line. Within the area of this slope the bottom is generally composed of sand or mud; but along the edge outside of one hundred and fifty fathoms, there occur numerous rocky patches of considerable size. This section, between 44° and 45° 20′ north latitude, in depths generally less than 55 fathoms, is more commonly resorted to by the cod fishermen than any other part of the Grand Bank.

That portion of the bank lying between 45° 20′ and 46° north latitude can be considered as a third section, concerning which but very little is yet known. In consequence, the greater part of this region is generally regarded as barren by the fishermen, although, by trial, it is possible that portions of it might furnish good fishing. It has so far been but very little resorted to. This section has depths of thirty-two to fifty-seven fathoms, and embraces a great variety of bottom in its different parts—fine and coarse sand, pebbles, rocks, and broken shells, variously combined. Good catches of cod have been obtained between 50° and 51° west longitude. The "whale deep" occurs on the western part of the section. It is an irregular, shallow depression in the bank, extending nearly north and south, with a length of about forty-five miles and a width of about twenty-three miles. Its southern end lies in about 44° 58′, and its northern in 45° 41′ north latitude. The extreme eastern part is in about 52° 14′ west longitude. It has depths of fifty-seven to sixty-seven fathoms, the bottom consisting of mud. We are not informed as to the origin of the name by which this area is known, but it does not seem very appropriate, for one of its chief characteristics appears to be the absence of whales as well as of fish; while its shallowness, as compared with the depths at a short distance off the western edge of the bank, is quite marked.

The fourth or northern section of the Grand Bank comprises all that portion lying north of the parallel of 46° north latitude. It has an elongate triangular shape, being one hundred and eighty miles long on the parallel of 46°, and is about sixty-four miles wide on the eastern part, where it extends to 47° 04′ north latitude. Its width near the middle is about forty-five miles. This section includes the Virgin Rocks, which lie in 46° 27′ north latitude and 50° 54′ west longitude. The area westward of the Virgin Rocks has depths of thirty-seven to fifty-three fathoms, and a diversified bottom of sand, gravel, pebbles, broken shells, and large rocks. It is comparatively little resorted to by the fishing-fleet, and for this reason is less known than most of the other parts of the bank.

The group of small, rocky shoals, known as the Virgin Rocks, lies between 46° 23′ and 46° 28′ north latitude, and 50° 50′ and 50° 58′ west longitude. It consists of a large number of submerged elevations, the principal ones being named and characterized as follows: Main Ledge, lying in 46° 27′ north and 50° 47′ west, depths, three to nineteen fathoms; Brier Shoal, just

east of Main Ledge, thirteen to twenty fathoms; Southwest Rock, southwest of Main Ledge, fourteen fathoms; part of Main Ledge, twenty-nine fathoms; Bucksport Shoal, one and one-fourth miles nearly south of Main Ledge, four and three-fourths to eleven fathoms. A short distance from the latter shoal, on the south and east sides, are three other smaller shoals, called Sea Patch, Lone Star or Harper Shoal, and Bryant Shoal, with depths varying, from eleven to nineteen fathoms. South of these again, within a distance of one and three-fourths miles, are three more shoals, known as the Bull Dog, Old South Shoal, and Cabinet Shoal, with depths of seventeen to twenty fathoms. About one mile due north from Main Ledge begins a line of eight small shoals, which extends a distance of about three miles, with depths of nine to twenty-three fathoms. The nearest ones are called Northwest Shoals, and the remainder, in the order of their position, are Maloney Ledge, Prairie Shoal, The Hummocks, and Deep-Water Bank.

Fifteen miles eastward of the Virgin Rocks, between 46° 27′ and 46° 29′ north latitude, there is a group of similar shoals, known collectively as the Eastern Shoals. They extend about four miles north and south, and have an average width of a little more than two miles. Each shoal is of slight extent, but few of them exceeding one-fourth of a mile in diameter. There are twenty-five of these shoals in all, on which the depths of water range from seven to twenty-seven fathoms; between the shoals the depths vary from twenty-eight to thirty-nine fathoms, and the bottom is broken and rocky.

Between the Virgin Rocks and Eastern Shoal and about them the depths range from thirty-three to forty-eight fathoms, and the bottom consists of sand, coarse gravel, rocks, and broken shells. Bank clams (*Siliqua costata*), abound here, and squid and capelin are plentiful in their season, attracting large numbers of cod and making this region a very profitable one for the fishermen. Halibut also formerly occurred here in large numbers. The cod which frequent these shoals are generally of somewhat smaller size than those taken on other parts of the Grand Banks; they are caught with hand-lines on the shoaler areas, where the fishermen go in dories, one man to each boat, while the vessels lie at anchor near by.

The eastern part of the northern section of the Grand Bank, lying eastward of the Eastern Shoal and westward of 49° west longitude, has depths of thirty-seven to forty-five fathoms. The bottom consists of sand, coarse gravel, pebbles, rocks, and broken shells, much of this area being covered with rocks and supporting a rich assemblage of animal life. This rocky bottom is composed essentially of smooth round bowlders, distributed over sand, many of them being perforated by boring mollusks. Immense numbers of crustaceans, especially crabs, abound here, together with bank clams and other shell-fish, small star-fish, Holothurians, Ascidians, etc. This is one of the most favorable grounds for cod, principally from July to September.

That portion of the northern section lying east of the forty-ninth meridian is much less resorted to than the last above described, and is, therefore, less known. The depths of water range from thirty-four to fifty-four fathoms, and the bottom consists of sand, pebbles, and rocks.

North of the northeastern portion of the Grand Bank, the bottom slopes off gradually a distance of forty to forty-five miles from the edge of the bank, the depths nowhere exceeding seventy-five fathoms, excepting in a few small areas. The bottom is composed of sand, mud, and pebbles, the shoaler portions, with depths of fifty-five to sixty-five fathoms, being generally composed of coarse sand and rocks. Within the past five years good catches of cod have been made in this region by Gloucester fishing-vessels.

THE FISHERIES OF THE GRAND BANK.—The most important fishery of the Grand Bank is that for cod, which is engaged in by vessels from France, the United States, and the British

provinces. During the fishing season, which lasts from April first to October, large fleets of vessels from these three countries visit the different parts of this bank. In the early part of the season, April and May, the southern portion of the bank is principally resorted to, and good catches are frequently made south of 44° north latitude. As a rule, however, the larger part of the fleet remain between 44° and 45° north latitude. At this season, sand lant are especially abundant on this part of the bank, and large numbers are often found in the stomachs of the cod. In June, capelin make their appearance on the bank, at which time the cod seem to greatly increase in numbers. This body of cod, found in connection with the capelin, or in the capelin season, has received from the fishermen the name of "capelin school." It is distributed over all parts of the bank visited by the fishing-fleet. After the beginning of June, many of the vessels move to the northern part of the bank, fishing in the vicinity of, and to the eastward of, the Virgin Rocks. Very few vessels now remain south of 44° north latitude, for the best fishing is found between 44° and 45° 20′ north latitude, and to the northward of 46° north latitude.

As a rule, squid make their appearance on the Grand Bank in July, after which time but few fish can be caught with capelin or herring bait. The body of cod now occurring on the bank is termed the "squid school" by the fishermen. It is probable that these schools of cod, though known by different names, are composed mainly of the same fish that come on the bank in the spring, though with the addition of many others, which appear to be attracted to the region during the summer by the schools of capelin and squid. They occupy the same ground, and the fishing continues through September. Formerly, cod were abundant till December, but, at present, these fish leave the bank at a comparatively early period in the fall.

The cod fishery of the Grand Bank dates from the earliest settlement of North America and it probably had much to do with the opening up of our country in those early times.

The halibut fishery began on the Grand Bank about 1865, and has been vigorously prosecuted there ever since. At first the vessels resorted to Eastern Shoal-water, between 43° 45′ and 45° north latitude, where halibut were then found in immense numbers. Though so abundant at first their numbers soon became greatly reduced, and consequently other grounds were sought for. For a series of years that section of the bank lying west of 51° west longitude, and between 43° 40′ and 45° north latitude, was the favorite halibut ground, and several large fares of halibut were also taken in the immediate vicinity of the Virgin Rocks for two successive years (1869 and 1870), during the months of July and August. Notwithstanding the great abundance of halibut on the shoaler parts of the bank (from twenty-two to fifty fathoms), during the earlier years of the fishery, their capture was followed up so closely that they rapidly became much less numerous, and the fishermen were forced to seek new fields in the deeper waters (one to three hundred fathoms) along the southern and western edges of the bank. When first discovered in these deeper places, they were found in incredible numbers all along the western part of the bank in the winter and spring, and during the entire summer in other localities off the Northwest Prong. Although even in these places halibut are much less abundant now than formerly, the Grand Bank is still the great resort for vessels engaged in this fishery, and this region yet remains the most important halibut fishing-ground of the Western Atlantic.

When the halibut fishery first began on the Grand Bank, large catches could be made in the shoal waters during the entire year. After two or three years' continuous fishing, however, they could be found abundantly on the shoal grounds only in the winter and spring. While they were crossing the bank on their way to more northern localities or to deeper water, to which they were not known at that time to resort by the fishermen, it was supposed that they came on the bank from the eastern and southern edges, as they were distinctly seen to move towards the northwest.

More recently, since the beginning of the deeper-water fishing, it has been discovered that they more commonly migrate toward the northwest, along the edge of the bank on the west side, and in some cases their course has been traced even beyond the limits of the Grand Bank.

Since the foregoing was written (1880), halibut have been found in abundance in the deep water off the eastern side of the bank, but owing to the presence of icebergs during the greater part of the year, and the strength of the polar current in that region, but few vessels have ventured there.

GREEN BANK.

Green Bank is for its size one of the least important of the fishing-banks of the Western Atlantic, but one of the best halibut grounds lies in the deep water near its southern part, and as this is also called Green Bank by the fishermen, it may not be out of place to consider it in this connection. This bank has an irregular, elongate pear-shaped outline, the longer axis extending due north and south. It is situated between Grand and Saint Pierre Banks, being seven miles distant from the former and fifteen miles from the latter. Its extreme length within the sixty-fathom line, is sixty-two miles, north and south, from 45° 09′ to 46° 11′ north latitude, and its width is thirty-six miles, between the meridians of 54° 08′ and 54° 58′ west longitude. The area of the bank is about fourteen hundred and fifty square geographical miles. The depths range from forty to sixty fathoms, and the bottom is composed of sand, shells, pebbles, and rocks. The general direction of the polar current, which sets over this bank, is usually from the north to the southwest, its course, as well as its force, being more or less influenced by the wind. But little is known of the abundance of cod here, as the fishermen prefer to resort to grounds with which they are better acquainted and have seldom fished on this one. Within the past two or three years, however, some good fares of cod have been taken on Green Bank, in the late summer and the fall, by New England vessels.

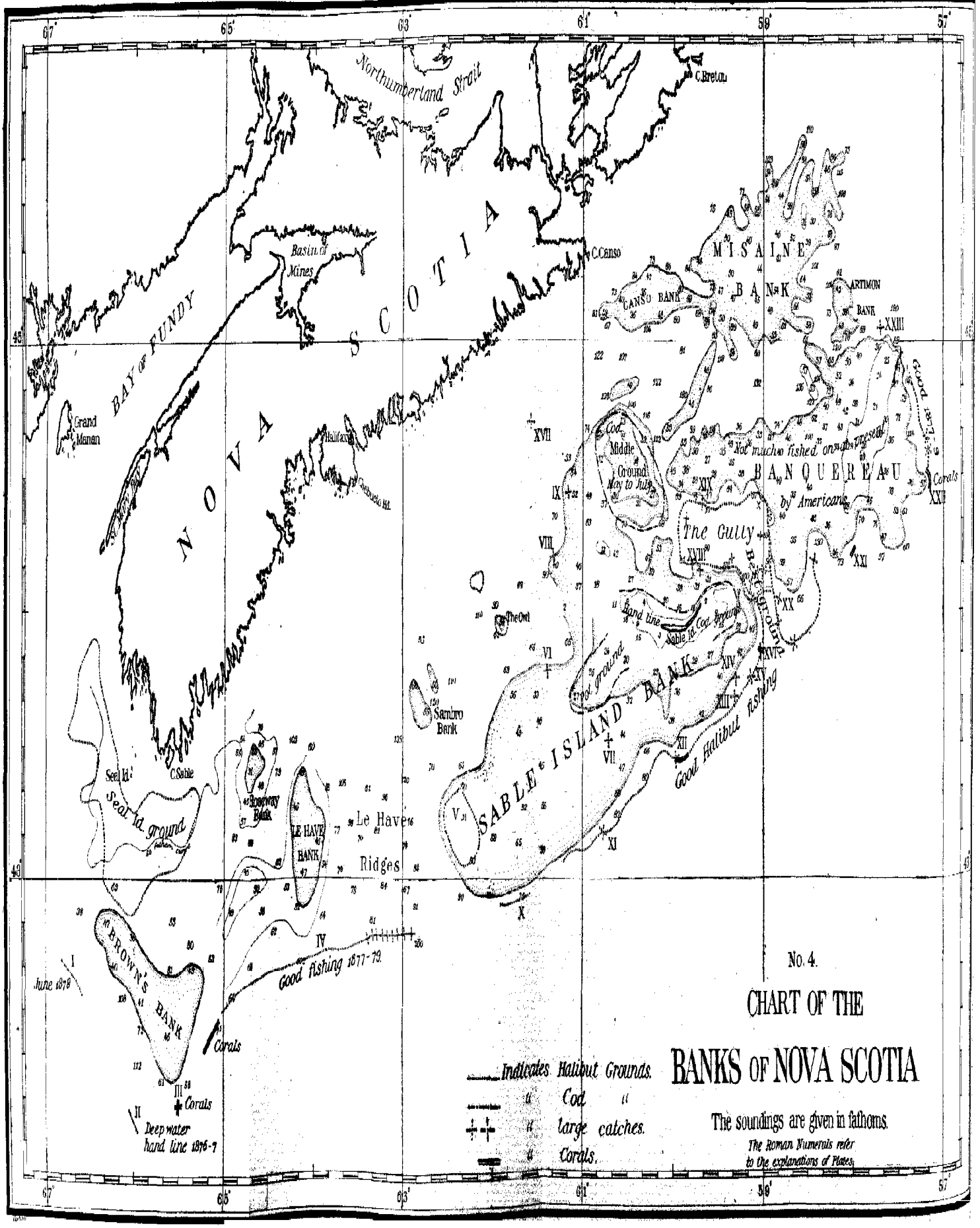
Since 1875, halibut have generally been found very abundantly in the winter and spring, and sometimes even during the summer, in from seventy-five to three hundred fathoms, off the southern edge of the bank, between the Grand Bank and Saint Pierre Bank.

This locality appears to be a feeding-ground in the winter, and during the spring lies in the direct course taken by the halibut in their migrations from the Grand Bank to other places farther north. At this season it is not uncommon for immense schools to make their appearance in this region and move leisurely along the edge of the bank. The only vessels fishing for halibut at this place are from Gloucester, Massachusetts.

BANK OF SAINT PIERRE.

The Bank of Saint Pierre is situated off the center of the southern coast of Newfoundland, between the parallels of 45° 10′ and 46° 54′ north latitude, and the meridians 55° 16′ and 57° 30′ west longitude. It is irregularly oblong in shape, about twice as long as broad, and extends in a northwest and southeast direction. At the northwestern extremity it is about half as wide as at the southeastern, where it rapidly broadens out, and ends abruptly along a nearly straight line bearing north and south. The longest side of the bank, which measures about one hundred and twenty-five miles, presents a slight outward curve and faces the southwest. The width of the northwestern end is about thirty-five miles, and that of the southern end sixty-five miles.

The northeastern edge of the bank is distant about twenty-seven miles from the nearest point on the Newfoundland coast, and from nine to ten miles from the islands of Saint Pierre and Miquelon. The gully separating Saint Pierre Bank from Green Bank runs directly


67°
65°
63°
61°
59°
57°
Northumberland Strait
C. Breton
C. Canso
MISAINE
BANK
CANSO BANK
ARTIMON BANK
XXIII
Good fishing 1877-79
BAY OF FUNDY
NOVA SCOTIA
Basin of Mines
Grand Manan
Halifax
Cornwallis Hd.
XVII
Cod
Middle Ground
May to July
Not much fished on by vessels
BANQUEREAU
by Americans
Corals
XXII
IX
VIII
XIX
The Gully
XXIII
XXI
XX
Hand line
Sable Id. Ground
The Owl
VI
XVI
XIV
XV
XIII
Sambro Bank
SABLE ISLAND BANK
Good Halibut fishing
VII
XII
Sea Id.
C. Sable
Sea Id. ground
Rosaway Bank
LE HAVE BANK
Le Have Ridges
V
XI
X
IV
BROWN'S BANK
I
June 1878
Corals
III
Corals
II
Deep water hand line 1876-7
Indicates Halibut Grounds.
" Cod "
" large catches.
" Corals.
No. 4.
CHART OF THE
BANKS OF NOVA SCOTIA
The soundings are given in fathoms.
The Roman Numerals refer to the explanations of Plates.

north and south, has a minimum width of fifteen miles, and depths ranging from sixty-five to one hundred fathoms. The total area of Saint Pierre Bank is about forty-six hundred square geographical miles. The depths range from twenty-two to fifty fathoms, the bottom being mostly composed of rocks and pebbles, although in some parts there are considerable areas of sand and gravel. Ordinarily, there is not much current over this bank, although at times, when driven by strong winds, the polar current, which sweeps around the south coast of Newfoundland, becomes quite strong.

Cod and halibut are the only food-fishes found in any considerable numbers on the bank of Saint Pierre, though a few cusk and haddock are sometimes taken. The general season for both cod and halibut begins usually about the first of April and continues until November. Cod are most abundant from the first of June to October, during which period they come in pursuit of capelin and squid. Halibut were formerly abundant on various parts of this ground during the spring and summer, but now they are rarely numerous except in the deeper water along the edges, or on rocky spots fifteen to twenty miles distant from the bank, in localities where no soundings are indicated on the published charts. Some of the schools of halibut breed on these rocky patches, but the greater number merely pass along the edge during their migrations toward the north. But few fishing-vessels, beyond the fresh halibut catchers and those owned by the French, resort at present to the bank of Saint Pierre, as some of the other neighboring banks offer much greater inducements. Saint Pierre has, therefore, lost a great deal of its former prestige as a fishing-ground, and assumes but a second rank among our great ocean banks.

The invertebrate fauna of this bank is moderately rich, but much less so than that of many parts of the Grand Bank, the fauna of the two regions including, however, about the same variety of forms.

BANQUEREAU.

Banquereau may be regarded as one of the most important fishing-banks lying between the fortieth and forty-eighth parallels of north latitude. Its entire outline is very irregular, but the main portion of the bank has a somewhat rectangular shape, with an elongate and nearly regular prolongation extending to the west. The length of the bank in an east and west direction is a little more than one hundred and twenty miles, and its greatest width about forty-seven miles; its total area is about two thousand eight hundred square miles. The main portion of the bank lies between 44° 04′ and 45° 01′ north latitude, and 57° 10′ and 59° west longitude, and the western prolongation between 44° 24′ and 44° 42′ north latitude, and 59° and 60° 05′ west longitude. North of Banquereau lie Artimon and Misaine Banks, the former being distant only about three miles and the latter from two to fifteen miles, the intervening depths ranging from sixty-one to one hundred and fifty-five fathoms. South of the western part of the bank is the eastern part of Sable Island Bank, from which it is separated by the "Gully" to be described further on.

On the eastern part of Banquereau there is an area of shoal ground, called the "Rocky Bottom," having a depth of about sixteen fathoms; elsewhere the depths range from eighteen to fifty fathoms, and the bottom is rocky as a rule, but on some parts of the bank there are patches of sand and gravel.

A current issuing from the Gulf of Saint Lawrence here meets the polar current, but although this produces some disturbance of the surface waters, the latter current is usually the stronger, and the tendency of the flow is, therefore, chiefly towards the west. The force as well as the direction of the current is much influenced by the wind, so that while quite strong tides may prevail for several days at a time, intervals may follow when there is but little if any current.

Cod and halibut are about the only fish taken in abundance on Banquereau, but hake, haddock, and cusk are sometimes found in small numbers. The Rocky Bottom is principally resorted to for cod, by the hand-line dory fishermen during the summer, and at times several hundred dories can be seen fishing there close together. As a rule, cod are most plentiful on the eastern part of the bank, although good catches are sometimes made toward the west. The best season for them is from May to November, when the schools gather upon the bank to feed on the lant, squid, crustaceans, and shell-fish, which are then very abundant.

Halibut are found throughout the entire year off the edges of the bank, where, at depths of one hundred to four hundred fathoms, large numbers are often taken. These localities are apparently both feeding and breeding grounds for halibut, and it is not unusual for a school of these fish to remain several weeks or even months in one locality, although it is very probable that some of the schools observed on the eastern side of the bank in the spring are migrating toward the north.

The principal places for halibut are along the southern and eastern borders of the bank; the Southwest Prong (in about 44° north latitude, and between 58° 30′ and 58° 55′ west longitude); the Middle Prong (44° 14′ north latitude and 58° west longitude); and the Eastern Slope (from 44° 28′ to 45° north latitude), in depths of one hundred and fifty to four hundred fathoms. These deep-water areas are rocky, and support a very rich growth of Gorgonian corals, sea anemones, etc.

ARTIMON BANK.

Artimon Bank lies north of the eastern part of Banquereau, from which it is separated by a narrow gully. It is of such limited extent (about one hundred and twenty square miles) that, compared with the latter, it is of but slight importance as a fishing-ground. The fishermen generally prefer to fish on the larger bank, and therefore know but little concerning the abundance of fish here, although it is certain that cod occur in greater or less numbers. This bank is fourteen miles long and ten miles wide, with depths of thirty-eight to fifty fathoms, and a bottom of coarse gravel and rocks.

MISAINE BANK.

This bank lies north of the western two-thirds of Banquereau, from which it is mainly separated by a channel about twenty miles wide. The eastern prolongations of these banks, however, approach one another quite closely. Misaine Bank has a very irregular outline, its general trend being about northeast by east and southwest by west. It lies between the parallels of 44° 55′ and 45° 45′ north, and the meridians of 58° 06′ and 59° 50′ west. Its greatest length is, therefore, about eighty miles and its greatest width about forty miles, its superficial area amounting to about seventeen hundred square geographical miles. The depths of water range from forty to sixty fathoms, and the bottom is generally broken and rocky.

But little is known concerning the abundance of fish on this bank, as it has been very rarely visited by vessels. It is probable, however, that occasional visits have demonstrated that cod are less abundant here than elsewhere in this region, and that this bank does not afford as profitable fishing as some others not far distant from it. This seems remarkable when we consider its large size and close proximity to Banquereau, which is an exceedingly valuable ground for both cod and halibut.

CANSO BANK.

Canso Bank is situated to the southeast of Cape Canso, Nova Scotia, from which it derives its name. The distance of its western end from the cape is about twelve miles. It is really a

western extension of Misaine Bank, with which it is connected by a narrow neck. It is very elongate, extending in an east and west direction, and lies between about 59° 50′ and 60° 50′ west longitude and 45° 01′ and 45° 16′ north latitude. Its length is about forty-five miles, its greatest width about thirteen miles, and its area not far from four-hundred and twenty-five miles. The depths of water on this bank range from thirty to fifty-six fathoms and the general character of the bottom is sandy, with spots of gravels and pebbles. It is unimportant as a vessel fishing-ground, and is too far distant from the land to be much resorted to by small boats.

THE GULLY.

The so-called Gully of the bank fishermen is the deep passage-way lying between Banquereau and Sable Island. It extends in a west-northwest and east-southeast direction north of Sable Island, but turns abruptly toward the south at its eastern end, and continues down between the eastern end of the Western Bank and the southwest prong of Banquereau. It constitutes an important halibut ground. Its entire length is about sixty miles, and its greatest width twenty miles. The depths range from sixty-six to one hundred and forty-five fathoms, and the bottom consists of rocks, gravel, sand, and mud. The rocky and gravelly portions form several ridges, separated generally by areas of the finer materials, excepting in the eastern section, where the intervening bottom is mostly composed of pebbles and sharp rocks. The ocean currents generally set over this area in a westerly direction, but vary much in strength, an easterly wind often increasing their force, while at other times there may be no perceptible current at all. Halibut have not been found, at least not in sufficient numbers to warrant fishing for them, over the entire extent of the Gully; but the halibut grounds proper are limited to the rocky and gravelly ridges and slopes of that portion of the Gully included between the meridians of 59° and 60° west longitude. When this fishery began it was carried on chiefly during the spring, in the northern and western part of the Gully; but in 1877 the fishermen made successful trials farther out, taking good fares even as late as June and July; since then good catches have been obtained in the winter, and it would appear that the halibut come here merely to feed, as they generally move to other localities just previous to the spawning season. With a few exceptions, Gloucester halibut vessels are the only ones that have fished on this ground. Instances are on record of the appearance of cod in the Gully in sixty-five to ninety fathoms of water, but they are not found regularly in the same places each year. The rocky bottoms of the Gully are very rich in animal life, affording abundant food for the halibut, and lant and herring are also frequently plentiful in their season.

SABLE ISLAND BANK OR WESTERN BANK.

Western Bank is one of the most important fishing-grounds of the Western Atlantic, considered either as to size or the abundance of fish. It lies south of Cape Breton Island and the eastern part of Nova Scotia, between the parallels of 42° 55′ and 44° 46′ north latitude and the meridians of 59° 04′ and 62° 35′ west longitude, and has a length of one hundred and fifty-six miles and a width, including the Middle Ground, of seventy-six miles. The general contour of the bank within the sixty-five-fathom line, as laid down on the Admiralty chart, approaches somewhat a very elongated ellipse, with the longer axis running about northeast by east and southwest by west; but over a broad area to the eastward of the center of the bank soundings of less than sixty fathoms connect it directly with Middle Ground, which we have here included in the same bank. The total extent of the bank thus defined is about seven thousand square geographical miles. Off its eastern end lies Banquereau, with the Gully between, and a short distance off the western end are the Le Have Ridges.

The depths off the southern side of the bank rapidly increase from sixty to seven hundred, twelve hundred, and fourteen hundred fathoms.

At the eastern end of Western Bank is Sable Island, a long and narrow crescent-shaped elevation, entirely formed of sand, which has been blown into innumerable hummocks or dunes. Off both ends of the island are long and dangerous sand-bars. The length of the island is about twenty miles, and its greatest width one and one-half miles. It extends in a nearly east and west direction. The depth of water on the bars, for a distance of from seven to ten miles, does not exceed two fathoms, and even ten miles farther out, both to the east and west, the depths are not greater than ten or eleven fathoms.

As a general rule, the bank slopes gradually from the island toward the south and west, the depths ranging from eighteen to sixty fathoms. The bottom is mostly sandy, with patches of gravel and pebbles. On the Middle Ground there are several shoal spots, with depths of ten to nineteen fathoms. The currents are occasionally quite strong in the vicinity of Sable Island and generally very irregular, being much influenced by winds. On the remainder of the bank there is usually but little current, whatever there is usually tending in a westerly direction.

Cod and halibut are the principal food-fish taken, other species of bottom swimmers occurring in less numbers. Cod are generally most abundant in the spring, from the first of March to June, although good fares are obtained throughout almost the entire year. For more than twenty-five years the Western Bank has been a favorite resort of the halibut fishermen. At first, these fish were found very plentiful on different parts of the bank in from forty-five to sixty fathoms, and since 1876 have been caught in great numbers along the edges on the south and east sides, in one hundred to three hundred fathoms. Like the cod, they are found during the entire year, the period of greatest abundance, however, being from the first of January to the first of October. The Western Bank may be considered both as a feeding and spawning ground for the cod and halibut. It abounds in shell-fish (quahogs, mussels, clams, and periwinkles), and crustaceans (crabs, shrimps, etc.), as well as in several species of small fish (lant and herring), upon which the cod and halibut prey. Although the cod do not gather in such great schools in winter as they do on George's Bank, it is nevertheless quite evident that they assemble at that season for the purpose of reproduction. Usually they are found most abundant on the western part of the bank in winter, but as spring advances they move into shoaler water in the vicinity of Sable Island, the "bend" of the island and the region about the bars being favorite grounds during the late spring and early summer. The fish taken near the island are, as a rule, somewhat smaller than those caught farther west. Vessels from all along the New England coast and from the British provinces resort to this bank to pursue the cod fishery, but fishing for halibut is almost exclusively carried on by the Gloucester fleet. The two bars at the eastern and western ends of Sable Island, as well as the shoal water off the northern side of the island, are favorite localities for dory hand-line fishing for cod.

THE OWL AND DOUBTFUL BANKS.

The Owl is a very small bank, lying in 43° 57′ north latitude, and 61° 55′ west longitude. It is somewhat triangular in outline, being about five miles long by three miles wide at the broadest end, and having an area of about ten square miles, as laid down on the Admiralty chart. The only depth of water given is fifty-four fathoms, with sixty to ninety fathoms off the edge.

Doubtful Bank lies about fifteen miles northwest of the Owl, and is of less extent than the latter, having an area of about six or seven miles only. The depth of water is thirty-two fathoms, eighty-two fathoms occurring in the immediate vicinity. Both of these small grounds

have in times past furnished a few good trips of halibut, but they are not now considered of any importance to that fishery. They are, however, more or less resorted to for cod by American vessels.

SAMBRO BANK.

Sambro Bank lies between the parallels of 43° 36′ and 43° 47′ north, and the meridians of 62° 40′ and 62° 55′ west, the greatest length, northeast by north and southwest by south, being twelve miles and the greatest width seven miles. The area of the bank is about seventy square miles. It has a depth of fifty-four to sixty fathoms, with depths of one hundred and ten to one hundred and thirty-three fathoms a short distance off its northeastern edge. The bottom consists mostly of sand, gravel, and pebbles. Sambro Bank, from its small size, is seldom visited by fishing-vessels, and has, therefore, never attained any importance as a fishing-ground.

LE HAVE BANK.

Le Have Bank is situated to the eastward of Brown's Bank, and south and east of Roseway Bank. It extends from 42° 34′ to 43° 26′ north latitude, a distance of fifty-two miles, and from 63° 50′ to 65° 07′ west longitude, a distance of about fifty-four miles. The bank is nearly divided into two portions, of which the eastern portion (Le Have Bank proper) extends north and south thirty-nine miles, and the western portion nearly east and west about thirty-five miles. The total area of the bank is about twelve hundred and forty square miles. The bottom is largely composed of coarse gravel, pebbles, and rocks, with smaller areas of sand distributed here and there. The depths of water range from forty to fifty fathoms. The general set of the current is to the westward, but this, however, is influenced very much by the direction and force of the wind, generally running quite strong during easterly winds. The principal fish taken on this bank are cod and haddock, although other species of bottom feeders are more or less plentiful. Cod are found at all seasons of the year, but are, perhaps, more abundant during the early winter than at any other period, and good trips are frequently obtained by the Gloucester vessels, which are the only ones that go there at that season. The Gloucester winter haddock-catchers, which carry their catch fresh to the Boston market, have extended their trips from George's and Brown's Banks to Le Have, and during the present winter (1880–'81) have made some remarkably good fares, several of them being the largest on record. Most of the lower forms of animal life found on the Western Bank and Le Have Ridges also occur on Le Have Bank. Le Have was at one time (1855 to 1865) quite a favorite fishing-ground for halibut, and considerable quantities are occasionally taken now by the hand-line cod fishermen in winter, though they do not occur in sufficient numbers to warrant trawlers going there.

LE HAVE RIDGES.

The fishing-ground known as Le Have Ridges is simply a continuation of Le Have Bank to the eastward, in the direction of the Western Bank, a distance of about forty-five miles. This places the eastern limit in 62° 50′ west longitude, while the northern and southern boundaries are about the same as those of Le Have Bank. The extent of the ridges is about fifteen hundred and seventy-five square miles. The bottom is a succession of ridges of gravel and pebbles, with occasional patches of rocks, the depths varying from fifty-five to eighty-five fathoms. The current, though occasionally strong, is weaker here than farther west on the bank, and, excepting during easterly winds, is but little noticed. The general set is westerly. The Ridges were for a number of years one of the favorite places of resort for the halibut catchers in the winter, and many good trips of cod have also been taken there at that season. At present, but few halibut

are caught except in the deep water along the southern edge of the ground, where they have sometimes been found quite plentiful during nearly the entire year. Hake are also found in large numbers in the deep water about the edges of the ground, and even on the ridges. As a general thing, few vessels besides those from Gloucester have made a practice of fishing on Le Have Ridges, though cod-fishermen from other places stop there now and then during the summer. In the deep water bordering the southern side of Le Have Ridges, Gorgonian corals (*Primnoa, Paragorgia, etc.*) occur on the rocky bottoms, while on the ridges themselves sea anemones, star-fishes, mollusks, crabs, and other crustaceans abound.

ROSEWAY BANK.

Roseway Bank lies north of the western part of Le Have Bank and southeast of Shelburne light, Nova Scotia. It is oblong in shape, and of slight extent (about two hundred and seventy square geographical miles), its greatest length being about twenty-one miles, and its greatest breadth about fifteen miles. It extends from 43° 12′ to 43° 33′ north latitude, and from 64° 25′ to 64° 52′ west longitude, and at the northwest corner is connected with the shore limit of sixty fathoms by a narrow neck. The depths on this bank vary from thirty-three to forty-eight fathoms, and the bottom consists of sand, gravel, and rocks.

The currents in this region are not nearly so strong as in the vicinity of Cape Sable and Brown's Bank. The general direction of the flow is about west-southwest and east-northeast, the westerly current being usually much the stronger, although the force and direction of both are more or less influenced by the winds. The principal fish taken on this bank are cod, haddock, and cusk, but hake, pollock, and halibut also occur there. The best fishing season is generally from May to October, during which time the bank is mainly resorted to by small sized vessels from the western part of Nova Scotia, although a few New England vessels also occasionally fish there.

BROWN'S BANK.

Brown's Bank lies in a northeasterly direction from George's Bank, and is separated from it by a gully fifteen miles wide, in which the depths of water range from one hundred to four hundred and fifty fathoms. This bank is imperfectly laid down on the published charts now in use by the fishermen, and no comprehensive idea of its extent and consequent importance as a fishing-ground is, therefore, conveyed by them.

The charts published by the United States Coast Survey define the boundaries of the bank much more accurately and afford a better idea of the area visited by the fishing-vessels than the Admiralty and Eldridge charts. The depths of water range from twenty to seventy-five fathoms over this area, which embraces within its limits about twenty two hundred and seventy-five square miles. The greatest length of the bank, from southeast to northwest, is sixty-three miles, and the extreme breadth forty-three miles. It is situated between 64° 52′ and 66° 29′ west longitude, and 41° 50′ and 43° 02′ north latitude. There is a small rocky shoal on the northern part (the exact location of which seems not to have been definitely determined), on which, it is said, there is not more than nine to fifteen fathoms of water. The bank slopes away from the shoal on the south and east, to depths of fifty-five to seventy-five fathoms; but at a distance of twelve to fifteen miles off it again rises to depths of thirty to fifty fathoms. This area of shoal water, within the fifty-fathom limit, is fifty miles long with an average width of fifteen miles. North of the shoal the bottom drops off suddenly to depths of seventy to eighty fathoms. The bottom is largely composed of coarse sand, gravel, pebbles, and rocks, and is rich in animal life.

The tides are quite as strong here as on the eastern side of George's Bank, the ebb having an average strength of one and one-third miles an hour, while the flood runs somewhat stronger. The greatest strength of the flood-tide sets nearly northwest, while the ebb flows in nearly an opposite direction.

Cod, halibut, and haddock are the principal food-fish occurring on this bank, but pollock and hake are also found in less numbers. Cod are quite plentiful in the winter, and some good fares are obtained, although comparatively few vessels fish here at that season, most of them going to George's. At other seasons, however, the cod fishery on Brown's Bank compares favorably with that of any of the other banks in that vicinity. Quite a number of the so-called Georgesmen fish here, and a few resort principally to this bank during the entire year. Halibut were formerly found in abundance, but at present this fishery is limited to an occasional trip to the deep water off the southern or western edge. A small quantity of this fish is also caught by the hand-line fishermen. The haddock fishermen frequently visit this bank during the winter, and often make good catches.

SEAL-ISLAND GROUND.

Off the western part of Nova Scotia there is an important fishing locality, to which no name is given on the charts, but which is called by the fishermen Seal-Island Ground. It is a direct continuation of the shore soundings, which slope gradually from the land toward the south and west, and continue in a northerly direction beyond what might be properly regarded as the limit of the ground. To the south it extends nearly to Brown's Bank, from which it is separated by a narrow gully; to the west it reaches thirty-eight miles beyond Seal Island, and to the northwest about thirty-five miles from the same island. The southern limit of the ground is in 43° and the northern in 43° 45′ north latitude, while the western boundary may be placed at 66° 40′ west longitude. The entire ground covers an area, outside of the three-mile line, of twelve hundred and fifty square miles.

There is a small shoal called Pollock Rip, with a depth of seven fathoms, bearing southwest from Seal Island, from which it is distant nine and one-half miles, but otherwise the ground slopes quite gradually, the depths ranging from fifteen to seventy fathoms.

The bottom is mainly composed of coarse gravel and pebbles, with occasional rocky spots of greater or less extent. The tides sweep out from and in toward the Bay of Fundy with considerable force, the course varying with the direction of the land, so that while they run nearly north and south on the northern part of the ground, they swing round to the southward of Seal Island and there run northwest and southeast. The flood is stronger than the ebb, and the fishermen estimate that one flood tide will carry a vessel nearly as far in a northerly direction as two ebb tides will carry it in the opposite way, although this is doubtless an exaggeration.

The principal fish caught on this ground are cod, haddock, and pollock; but halibut, cusk, and hake are taken to a limited extent, and occasionally herring and mackerel are netted for bait.

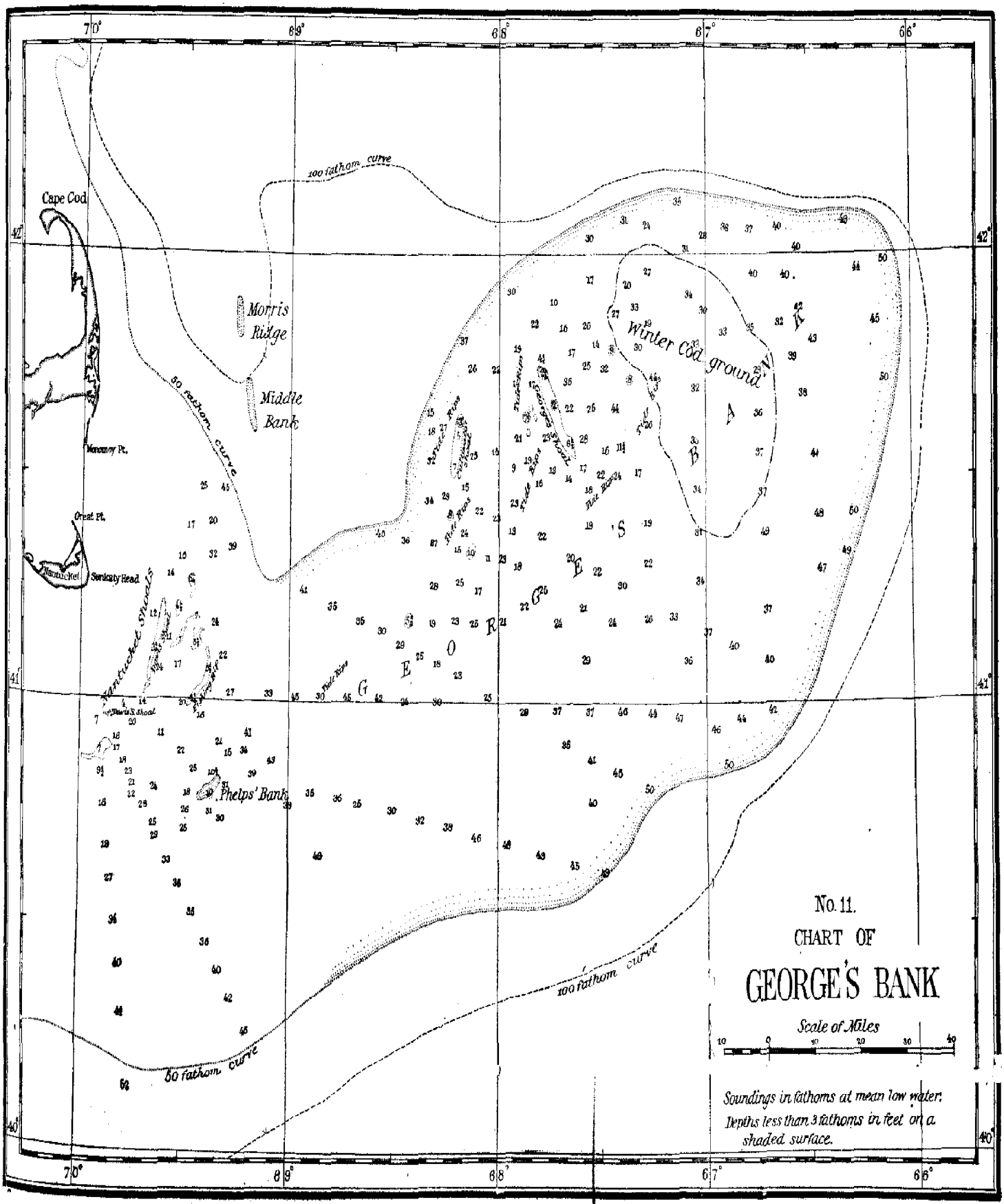
Cod are generally more abundant from spring until fall than during the winter, but haddock and halibut occur throughout the year. Fishing usually begins in April or May, and continues until October. Halibut were formerly very plentiful in this region, but are now comparatively scarce.

This ground may be considered as essentially a feeding-ground for cod, which appear to come here after the spawning season is over, to fatten upon the crabs and mollusks living on the bottom and the herring and other species of small fish that swim back and forth in the tide rips. All parts of the ground are fished on at the same time. This was formerly a favorite fishing

locality for vessels from the coast of Maine, but since the almost universal adoption of trawl-fishing, only a few American vessels beyond Georgesmen (hand-liners) go there. The New London halibut schooners occasionally visit it in summer. The fleet resorting there now is principally composed of vessels belonging to the western part of Nova Scotia, which generally "fish at a drift," moving back and forth over the ground with the wind and currents.

GEORGE'S BANK.

George's Bank is by far the largest and most important fishing-ground near the coast of the United States, and is second to none in the Western Atlantic except the Grand Bank of Newfoundland. It lies to the eastward of Cape Cod and Nantucket Shoals, and is apparently an extension of the latter, since the water is no deeper between the southern part of the shoals and the western part of the bank than in many places upon it. As laid down on the charts, the southern limit is in 40° 40′ north latitude, although the fifty-fathom line extends seven miles farther south; the southern boundary may, therefore, be regarded as in about 40° 30′ and the northern as 42° 08′ north latitude. The eastern part is in about 66° and the western in 69° west longitude. The greatest length from the northeastern to the southwestern extremity is about one hundred and fifty miles, and the greatest width north and south ninety-eight miles, according to the charts of the United States Coast Survey. The depths range from two to fifty fathoms. On the western part, between the parallels of 41° 10′ and 41° 53′ north latitude and the meridians of 67° 20′ and 68° 37′ west longitude, are a number of shoals, known as the East Shoal, the North Shoal, the Southwest Shoal, Cultivator Shoal, etc. The Southwest Shoal is the largest, being fifteen miles in length south-southwest and north-northeast, with an average width of two and one-half miles. The position of the center of this shoal is 41° 39′ north latitude and 67° 48′ west longitude. There are from two to fifteen fathoms of water on the shoals, and between them from twelve to thirty fathoms. The tides sweep over these with great force, causing strong rips, and, during rough weather, the sea breaks heavily on them, rendering approach to their vicinity extremely hazardous. The bottom is chiefly sand, although patches of rough ground—gravel, pebbles, and rocks—of greater or less extent, are found in some localities. Its position between the Bay of Fundy and the Gulf Stream causes the tides to run swifter than on the other banks, and to swirl around instead of passing directly back and forth. They sweep around the compass, from left to right, attaining the greatest velocity when flowing southeast and northwest and the least velocity when moving southwest and northeast. The first attempt at fishing on this bank, of which there is any record, was made in 1821 by three Gloucester vessels. The George's cod and halibut fishery of later date did not become fully established as a permanent industry until about 1835, although vessels went there for halibut in 1830. At first the catches consisted mostly of halibut, but since 1850 they have been chiefly of codfish, although more or less halibut are taken with them. During the months of February, March, and April large schools of cod make their appearance on the bank. They are generally found on the "winter fishing-ground," a part of the bank lying to the eastward of the shoals, between 41° 30′ and 42° north latitude and 66° 38′ and 67° 30′ west longitude. This is essentially a spawning-ground for the cod, which appear to come on the bank from the southeast, as they almost invariably, after reaching the ground, move slowly to the north and west as spring approaches. This is in the direction of the shoals, and, as the pursuit of the fish brings the vessels near the latter, great loss of life and property sometimes occurs during heavy easterly gales. As soon as the spawning season is over the schools of cod break up, but more or less fish are caught on different parts of the bank during the entire year, though rarely, if ever, are they found so plentiful as when the winter school is on the ground.


70°
69°
68°
67°
66°
42°
41°
40°
100 fathom curve
Cape Cod
Morris Ridge
Middle Bank
50 fathom curve
Monomoy Pt.
Great Pt.
Nantucket
Sankaty Head
Nantucket Shoals
Phelps' Bank
Winter Cod ground
Tail Rips
Spruce Rips
Fish Rips
No. 11.
CHART OF
GEORGE'S BANK
Scale of Miles
10 0 10 20 30 40
Soundings in fathoms at mean low water.
Depths less than 3 fathoms in feet on a shaded surface.

The codfish fleet, which numbers about one hundred vessels, is wholly from Gloucester, Massachusetts. Besides these, there are twenty-five to thirty vessels from the same port that fish on George's for haddock in the winter, and a few others, from ports in Long Island Sound, engage in the halibut and cod fishery to a limited extent in the spring and summer.

The area of the "winter fishing-ground" is about eleven hundred square miles, while that of the whole bank is eighty-four hundred and ninety-eight square miles. All of this area, with the exception of the shoals, is available for fishing purposes in the summer season for cod, halibut, haddock, and mackerel.

Various kinds of shell-fish, such as pectens, mussels, and periwinkles, and crabs, and other crustaceans abound over most parts of the bank, and herring and lant are quite plentiful during most of the year.

13. THE MACKEREL AND MENHADEN FISHING-GROUNDS OF THE EASTERN COAST OF THE UNITED STATES.

THE MACKEREL GROUNDS.

The most extensive and valuable mackerel fishing-grounds of the world are located off the eastern coast of the United States, between the parallels of 36° and 45° north latitude, and the meridians of 66° and 75° 30′ west longitude. They extend from a point a short distance north of Cape Hatteras (about fifty to seventy miles directly off the mouth of Chesapeake Bay) to the eastern and northern limit of the Gulf of Maine, comprising the entire extent of the latter region. The length of these grounds, in round numbers, is about seven hundred miles, and the average width may be regarded as at least eighty miles, making a total area of about 56,000 square geographical miles, all of which is resorted to by the mackerel catchers of the United States. Over this region the mackerel swarm at certain seasons in incredible numbers, although the entire region is not generally filled with schools of these fish at the same time.

In their spring migrations the mackerel approach the coast north of Cape Hatteras, and the first captures are usually made in the latter part of March or the beginning of April, between the parallels of 36° and 38° north latitude, at distances of twenty-five to seventy miles from the land. The following statements of early catches of mackerel, from 1878 to 1881, will give a comprehensive idea of the localities and dates at which the first schools make their appearance.

EARLY CATCHES OF MACKEREL IN 1878.

March 30.—Off Chincoteague, Virginia; schooner Lilian, of Noank, Connecticut.

April 16.—Latitude 36° 10′ north, longitude 74° 45′ west; schooner Sarah M. Jacobs, of Gloucester.

April 18.—Twenty-five miles southeast of Cape May; schooner Alice, of Swan Island, Maine.

April 25.—Fifty miles southeast of Cape May; schooner John Somes, of Swan Island, Maine.

EARLY CATCHES OF MACKEREL IN 1879.

April 12.—Latitude 36° 35′ north, longitude 74° 50′ west; schooner Sarah M. Jacobs, of Gloucester.

April 13.—Latitude 37° 57′ north, longitude 74° 23′ west; schooner Augusta E. Herrick, of Swan Island, Maine.

April 13.—Seventy-five miles south-southeast of Cape Henlopen; schooner S. G. Wonson, of Gloucester.

April 14.—Latitude 38° 08′ north, longitude 73° 57′ west; schooner Charles Haskell, of Gloucester.

April 19.—Latitude 37° 50′ north, longitude 74° 03′ west; schooner Alice, of Swan Island, Maine.

EARLY CATCHES OF MACKEREL IN 1880.

April 1.—Latitude 35° 30′ north, longitude 74° 15′ west; schooner Edward E. Webster, of Gloucester.

EARLY CATCHES OF MACKEREL IN 1881.

March 20.—Latitude 37° 10′ north, longitude 74° 05′ west; schooner Edward E. Webster, of Gloucester.

April 18.—Latitude 38° 38′ north, longitude 74° west; same schooner.

May 16.—Off Block Island; schooner Alice, of Swan Island, Maine.

As the season advances the mackerel move northward, the vessels following their migrations so far as possible. After a short period, however, the schools appear to strike the coast in a succession of waves, if that term may be allowed, and it generally results that, within a few weeks at most after the first captures have been made in the spring, numerous schools are to be met with along a considerable extent of coast, and, not unfrequently, from near the land to a distance of sixty to seventy miles off. It is often difficult for the fishermen to determine positively whether the mackerel that suddenly appear off Sandy Hook or Long Island belong to schools met with south of the Delaware a day or two previously, or whether they have just approached the coast for the first time, having come in directly from the Gulf Stream. However that may be, it frequently happens that they are taken at the same time at numerous places all along the coast from near Montauk Point, Long Island (and possibly near Block Island), to the mouth of the Delaware River, and even farther southward. It is also not unusual for catches to be made on the same day both at Cape Cod and off New York, with reports of fish in greater or less abundance at intervening localities, as off Montauk Point, Block Island, No Man's Land, and the south shoal of Nantucket, and in the south channel between George's Bank and Nantucket Shoals.

During the early part of the season, while the spring or southern mackerel fishery is in progress (usually from March 20 to June 1), a large percentage of the catch is marketed fresh, chiefly in New York. The vessels frequently meet in port, and the fishermen are thus afforded an opportunity of comparing notes, which, in consequence of the broad areas traversed in the passage to and from market, enables them at this season to correctly estimate the area covered by the mackerel as well as their abundance.

After the beginning of June, the Gulf of Maine becomes the great mackerel ground. As the schools of fish pass in the South Channel they appear to separate, a portion moving up by Cape Cod, usually not far from the land, while other schools take a more easterly course, sweeping off toward Cashe's Ledge, or even across toward Cape Sable. These various schools, which seldom have precisely the same movements two years in succession, are followed by different sections of the mackerel fleet, and at this season the vessels are scattered from Block Island and No Man's Land to Cashe's Ledge and Cape Sable. The vicinity of Block Island has frequently remained a favorite fishing-ground throughout the summer, mackerel of extraordinary size and superior quality having been taken there during this entire period. George's Bank has also been a more or less favorite locality at the same season, and, like Block Island, has been quite celebrated for the excellent quality of its fish. Owing, however, to the prevalence of exceedingly strong tides on this bank, and to the fact that stormy weather is usually of frequent occurrence in the fall, mackerel fishing is not generally carried on there after the middle of September. As the loss of seine boats,

and possibly of seines, may result from the vessels being caught out in a severe gale, the fishermen are more cautious at the present time about remaining on George's in the fall than they were formerly, when hooks and lines were the chief appliances of capture.

Mackerel are occasionally found in abundance on Brown's Bank, situated northeast of George's Bank, and on the Seal-Island Ground, but their occurrence in great numbers in these localities may be regarded as exceptional rather than as the rule. Although the movements and abundance of mackerel are subject to yearly variations of greater or less magnitude, it can be safely stated that during the months of June, July, and August, the following localities furnish the most important mackerel grounds on our coast: Cashe's Ledge and vicinity, covering an area about sixty or seventy miles across, and having Cashe's Shoal as a center; the vicinity of Monhegan Island, from near Cape Elizabeth to Matinicus Rock, and from close in shore to a distance of forty miles off shore; and the vicinity of Mount Desert Rock, from the rock to near the main land, and outward from it in all directions for distances of twenty to twenty-five miles.

In the fall, after the mackerel have begun their migrations toward the south and west, the principal localities resorted to by the fishermen are successively as follows: Off Cape Elizabeth, and about Boon Island, Maine; off Cape Ann, Massachusetts Bay, Barnstable Bay, and off the outer side of Cape Cod. Fortunately, at this season, the mackerel usually follow the trend of the shore, and strike into the larger bays which indent the coast line. This permits of the fishery being carried on with little risk, at a period when severe gales are of frequent occurrence on the New England coast, as the vessels are generally within easy reach of safe harbors.

Efforts have been made from time to time to trace the movements of the schools of mackerel after they have passed Chatham, Cape Cod, the last locality where they are generally caught in the fall, but always without success. The failure of these attempts is chiefly due to two causes, namely: first, the almost steady prevalence at that season of unfavorable weather for fishing operations; and, second, the disinclination of the fishermen, at the close of the season, to push with their accustomed vigor an enterprise which appears to promise but slight money returns at the most, and exposes them to great personal risk.

THE MENHADEN GROUNDS.

The menhaden fishing-grounds of the eastern coast of the United States extend at the present time (1883) from Chesapeake Bay to and including Long Island Sound, and, in some seasons, also include a portion of Vineyard Sound, on the southern coast of Massachusetts. They are of limited width, the fishery being rarely carried on at greater distances from land than ten to fifteen miles. Their total area may be reckoned, in round numbers, at about 5,350 square geographical miles, which can be itemized as follows: Long Island Sound and the vicinity of Block Island, 1,200 square miles; off the south side of Long Island, from Montauk Point to Sandy Hook, with an average width of fifteen miles, 1,575 square miles; off the New Jersey coast, from Sandy Hook to Cape May, 1,575 square miles; Delaware Bay, 150 square miles; Cape Henlopen to Cape Charles, with an average width of about two miles, 250 square miles;[1] Chesapeake Bay, from the capes to Tangier Sound, 600 square miles.

Formerly the menhaden fishery was carried on along a much greater range of coast, extending from North Carolina to Mount Desert, Maine. Prior to 1879 menhaden occurred in great abundance in the Gulf of Maine, and the bays and estuaries connected with it, from May to October, and the waters of that region often seemed literally alive with the numerous large schools, many of

[1] Along this stretch of coast fishing for menhaden is carried on only to a limited extent, chiefly by means of seines set from the beaches, and the area of the grounds is, therefore, very small considering their great length.

which ascended the rivers to the limit of salt water. Before the introduction of purse seines they were extensively captured in gill-nets, for use as bait by the cod and mackerel fishermen, and a large proportion of the fish taken to supply the factories of menhaden oil and fertilizers, during the early period of that industry, were obtained in the same manner. In the summer of 1879, from some unexplained cause, but presumably from the prevalence of lower average temperatures in the surface waters, the menhaden failed to make their appearance north of Cape Cod, and since then they have never returned to their former grounds in the Gulf of Maine.

Mr. R. Edward Earll, who investigated the coast fisheries of the southern Atlantic States in 1880, states that for several years previous to 1878 menhaden fishing was carried on to a limited extent in Core Sound and about Ocracoke Inlet, on the coast of North Carolina. At Oregon Inlet some menhaden fishing was also done for two or three years, steamers having been employed for the purpose during one season. A purse seine was set once from Charleston, South Carolina, but it was so badly cut by the sharks that it was never tried again.

Previous to 1878 the above mentioned stations on the coast of North Carolina marked the southern limit of the menhaden fishing-grounds, but as the catches there proved unremunerative, the fishery was discontinued, and since that time Chesapeake Bay has been the most southern region where fishing is conducted. In this locality, according to Mr. Earll, fishing begins in May and continues until October; but the fishery is neither so important nor profitable as it is farther north, both because of the less abundance of fish and their poorer quality as compared with those taken about Long Island and off the New Jersey coast.

As to the times of arrival and departure of the schools of menhaden in the several fishing-grounds, Mr. G. Brown Goode says: "The first schools appear in Chesapeake Bay in March and April, on the coast of New Jersey in April and early May, and on the south coast of New England in late April and May; off Cape Ann about the middle of May, and in the Gulf of Maine about the latter part of May and the first of June. Returning, they leave Maine in late September and October, Massachusetts in October, November, and December, Long Island Sound and vicinity in November and December, and Cape Hatteras in January.[1]

Off the coast of New Jersey and the southern side of Long Island, fishing usually begins in April, and by the last of that month or early in May it is carried on along the entire coast of Long Island, although it sometimes happens that no fish are taken in this region until after the first of May. The schools generally "play" in near the coast, where the fishing steamers lie in wait for them usually at no great distance from the shores; and whenever the schools rise to the surface they are quickly surrounded by the purse seines. During May the fish move around Montauk Point and into Long Island Sound, which, during the remainder of the season, becomes the most important fishing-ground for this species on the coast. There are periods of greater or less duration, however, during which the menhaden show little or no inclination to come to the surface. At such times the steamers often cruise on other grounds, going to the New Jersey coast, or even as far as Delaware Bay. When the schools are moving south in the fall, the steamers frequently follow them as far as the Delaware, but as the factories are mostly located on Long Island Sound, these long cruises are only made when the scarcity of fish nearer home renders them absolutely necessary in order to obtain supplies. Large catches of menhaden have seldom been made at a greater distance from the land than ten miles, and, as a rule, the best fishing has been obtained within two to five miles of the land.

[1] This statement of the arrival and departure of menhaden, extracted from "A History of the Menhaden," by G. Brown Goode, 1877, p. 39, applies to the condition of the fishery prior to 1878, since which time, as above described, these fish have not visited the coast of Maine.