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PART III.

THE MACKEREL FISHERY OF THE UNITED STATES.

By G. Brown Goode and J. W. Collins.

1.—THE MACKEREL PURSE-SEINE FISHERY.

The purse-seine has come into general use since 1850, and with its introduction the methods of the mackerel fishery have been totally revolutionized. The most extensive changes, however, have taken place since 1870, for it is only during the last ten years that the use of the purse-seine has been at all universal. As late as 1878 a few vessels have fished with the old apparatus in the Gulf of Saint Lawrence, and also a few on the coast of New England. Such changes in the manner of fishing for mackerel have brought about also a change in the fishing grounds. Vessels fishing in the old style were most successful in the Gulf of Saint Lawrence, but the purse-seine can be used to very much better advantage along our own shores between Cape Hatteras and the Bay of Fundy.

The mackerel fleet in 1879 and 1880 was owned almost entirely by Massachusetts and Maine, a very few vessels from New Hampshire and Connecticut also participating. The distribution of the vessels in the mackerel fleet, their tonnage, and the number of men employed are shown below in the tables prepared by Mr. R. Edward Earll.

1. THE FISHING GROUNDS.

In the spring, from March to the 1st of June, the mackerel seiners cruise between the capes of the Chesapeake and the South Shoal of Nantucket. The mackerel are first encountered off Chesapeake and Delaware Bays, from 20 to 50 miles from the land, and gradually move northward, followed by the fleet. When off the coasts of New Jersey, Long Island, and Block Island, the fish usually draw closer in to the land, frequently approaching within 1 or 2 miles of the shore. During the summer and fall months the principal seining ground for mackerel is in the Gulf of Maine, from the Bay of Fundy to Cape Cod; the immediate vicinity of Mount Desert Rock, Matinicus Rock, Monhegan Island, Cape Elizabeth, Boone Island, and Massachusetts Bay being favorite localities. Good catches of mackerel are frequently made in summer on George's Bank, and, within the past few years, near Block Island. Though mackerel have at times been taken in seines in the Gulf of Saint Lawrence, so little, comparatively, has been done in this locality that it can scarcely be classed among the grounds generally resorted to by the mackerel seiners. In a large majority of cases the mackerel schooners which have gone to the gulf within the last six or seven years have met with decided failures, and in 1880 several returned home from there without a single barrel of fish.

2. THE FISHERMEN.

The mackerel fleet contains a larger percentage of American-born fishermen than any other. The 113 mackerel vessels from Gloucester in 1879 were manned by 1,438 men, of whom 821 were

Americans; 322 Provincials; 24 British, most of whom were Irish; 39 Scandinavians; 6 French; and 13 Portuguese. The mackerelmen belonging to other ports in Massachusetts and on the coast of Maine have a still larger percentage of Americans in their crews, most of the vessels being manned *entirely by natives of New England. Many of the Gloucester fishermen engaged in the mackerel* fishery are in winter employed in the haddock fishery, in the George's cod fishery, or in the fresh-halibut fishery. Many others, like those from Provincetown and Maine, do not go to sea in winter. The winter herring trade is carried on almost entirely by the mackerel schooners and their crews from Gloucester and Maine, and the winter oyster business is in the same manner monopolized by the Cape Cod and Portland mackerel vessels, while some of them enter into the business of bringing fruit from the West Indies to the United States.

3. THE VESSELS.

The mackerel fleet in 1880 was made up of four hundred and sixty-eight vessels, which *pursued this fishery to a greater or less extent. Of these, two hundred and thirty-five vessels were* employed exclusively in catching mackerel between March and November, though some of the fleet did not start before June or July. A large number of these, the best fishing vessels of New England, in winter are engaged in the haddock fishery, in the George's fishery, in the herring trade, in the oyster trade, and in the West India fruit trade, as well as in the shore cod fishery.

There is a small fleet of vessels which, though, like their companions, designed for rapid sailing, are seldom employed in the winter, except in the herring trade to New Brunswick, on account of the shallowness and sharpness of their hulls, which renders them unfit to encounter the heavy winter gales in the open ocean.

The mackerel vessels are, as a class, swift sailers; they carry, while engaged in this fishery, all the canvas which their rig will allow. The manner in which their sails are managed, and the amount of canvas which they carry, are fully described in the chapter on the fishing vessels. The mackerel schooners, as a rule, spread more sail, in comparison with their size, than any other vessels in the world, except, perhaps, the extreme type of schooner-rigged yacht, which is essentially a development of the fishing schooner.

Vessels designed especially for the work of seining mackerel usually have a wide deck, much deck-room being necessary for the proper handling of the fish. Many of the schooners of 60 to 80 tons have a beam of 21½ feet to 23 feet. But, although plenty of deck-room is considered of great importance to a mackerel vessel, even deck room is held to be less necessary than speed. In consequence, every effort has been made by the builders to construct swift sailing schooners, and the result is that many of the vessels composing the mackerel fleet are able to cope successfully with many yachts of the same size. The mackerel vessel is fitted for seining: (1) By placing upon her a summer outfit of repairs and sails.* (2) By removing the heavy cables used in

* Whatever repairs are needed are first attended to, while, in the mean time, the jibboom is rigged out, the foretopmast (if the vessel carries one) is sent up, the spars cleaned and painted, and the rigging tarred. This having been done, the vessel is taken on the railway and thoroughly cleaned and painted. The work of cleaning and painting spars, tarring rigging, &c., was formerly done by the vessel's crew, but at the present time it is done by gangs of shoresmen organized for the purpose, the expense for the labor performed being paid for by the fishermen. The custom of hiring others to do this work began about 1863 or 1864. The fisheries were at that time very prosperous, and many of the fishermen preferred to pay some one for tarring and such work rather than to do it themselves. At first two or three men of the crew usually did the work, being paid for it by their shipmates, but in a short time it passed into the hands of the longshoresmen to the general satisfaction of both owners and crews. The work of cleaning the vessel's bottom, preparatory to painting it, is now often done by shoresmen, who are paid by the crew. The practice of hiring men to do this kind of work is general, and the above remarks apply equally well to all first-class fishing vessels sailing from Gloucester, though we are not aware that this custom has been so fully adopted elsewhere.

winter fishing, and substituting chain cables. This change is not necessary in the case of many of the Cape Cod and Portland vessels which are employed in the oyster trade, or in the case of most of the Gloucester vessels engaged in the herring trade, since these use only chain cables at any season. (3) By the removal of gurry-pens, and all other incumbrances from the deck. (4) By the rigging of a seine-roller upon the port-quarter rail. This is a wooden roller almost invariably made of spruce, 6 inches in diameter, and 9 to 10 feet long, which revolves on pivots in its ends, received into iron sockets in cleats, which are fastened to the rail. The forward end of the roller is about 3 feet aft of the main rigging. The use of this roller is to lessen the friction between the rail of the vessel and the seine, as the latter is being hauled on deck or overhauled into the boat.* (5) By the head-box being fastened to the forward end of the house. The head-box is a bin 10 or 12 feet long, and wide enough to receive the head of a fish-barrel. In this box are stowed the heads of the barrels that happen to be on deck. (6) By placing the bait-mill on deck, and fastening the bait-box (when one is used) to the main rigging on the starboard side. (7) By nailing boards to the top timbers underneath the main rail, between the fore and main rigging; these are about 6 inches in width, and are provided with single ropes, or stoppers, 2 or 3 feet apart; the object of these stoppers is to hold the cork rope of the seine when brought over the rail, preparatory to bailing the fish from the seine upon the deck. (8) By taking on board an ice-grinder, these being used only on vessels which carry their fish fresh to market. (9) By clearing the hold of all bulkheads, ice-houses, or other appliances, which may have been used in the course of the winter's fishery. (10) By properly adjusting the quantity of ballast; if the vessel has been in the haddock or George's fishery, ballast must be removed; if in the herring trade, ballast must be added; a mackerel schooner of 60 tons will carry from 15 to 20 tons of ballast, and in exceptional cases somewhat more. (11) By constructing an ice-house on those vessels which intend to take their fish fresh to market, somewhat similar to that on board the halibut vessels;† and (12) by taking on board the necessary supply of barrels.‡ Vessels which take their fish fresh to market carry from 175 to 250 barrels; those intending to salt their fish carry from 175 to 500 barrels, about one-third of this number being filled with salt, which is used in curing the fish, and serves in the meantime as ballast.

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* Capt. George Merchant, jr., of Gloucester, Mass., states that purse-seines were used by the fishermen of that port for six or seven years before "seine-rollers" were put on the vessel's rails. This useful implement was first invented and used by Capt. Simeon Tarr, of Gloucester, about the year 1857, while he was in command of the pinkey Andes.

† The mackerel schooner's ice-house, as a rule, occupies the middle portion of the hold, extending from side to side of the vessel one way, and from the grub beam to the forward side of the main hatch the other way. It is separated from the other sections of the hold by bulkheads, and is divided into a number of pens similar to those in the ice-house of a halibut schooner. Each of these pens is subdivided into three parts by shelves, which are constructed, when occasion requires, by laying some boards crosswise, the ends resting on cleats which are nailed to the sides of the pens. The first shelf is put in about 15 inches above the floor of the ice-house, and a second shelf 15 inches above the first. The front of the pens are closed by boards which slide in grooves on the stanchions or bulkheads. The mackerel are iced 15 inches deep on the floor of the pen, after which the first shelf is laid and another tier of the same depth is put on that. After the second shelf is put in, the fish are iced on it nearly to the deck, a covering of ice being put over all. In this way the fish can be kept in a better condition than if they were packed in a large bulk. If stowed in bulk the fish are jammed and soon become worthless. An average sized ice-house has a capacity of about 200 barrels of fresh mackerel; some ice-houses will hold 300 barrels.

Capt. Joseph Smith, of Gloucester, tells us that at present few of the mackerel vessels carry ice-grinders, since the fishermen prefer to use the ice-pick instead. Each vessel employed in market fishing is provided with from two to four ice-picks, and three men can pick up ice fast enough to supply a whole crew, even if they should ice 100 barrels or more an hour, which is about the average speed with which mackerel are taken care of. Captain Smith thinks his crew, on one occasion, iced 200 barrels in an hour and a half. About 4 tons of ice are put on 100 barrels of fresh mackerel.

‡ Vessels which carry a mackerel pocket or "spiller" are provided with outriggers on the starboard side and other necessary arrangements for its proper management. All of the seiners also have an outrigger on the port side, near the fore rigging, to which to fasten the seine-boat.

Wellfleet has a three-masted schooner, the Carrie D. Allen, employed in the mackerel fishery. Her burthen is 175 tons, and she carries 25 men.*

4. APPARATUS AND METHOD OF FISHING.

THE SEINE-BOAT AND ITS FITTINGS.—The boats used by the Gloucester fleet in the purse-seine fishery are built after a peculiar model and solely for this purpose. The present form of the seine-boat was devised about the year 1857 by Messrs. Higgins & Gifford, boat-builders, Gloucester, Mass.† The seines had previously been set from square-sterned, lap-streak boats, about 28 feet in length, and resembling in shape an ordinary ship's yawl.

The seine-boat, as now in use, resembles the well-known whale-boat, differing from it, however, in some important particulars.

The seine-boat, according to Mr. Gifford, must have three qualities: (1) It should tow well; consequently it is made sharpest forward. A whale-boat, on the other hand, is sharpest aft, to facilitate backing after the whale has been struck. (2) It should row well, and this quality also is obtained by the sharp bow. The whale-boat also should row well, but in this case it has been found desirable to sacrifice speed in part to the additional safety attained by having the stern sharper than the bow. (3) It should be stiff or steady in the water, since the operation of shooting the seine necessitates much moving about in the boat.

The Gloucester seine-boat of the present day is a modification of the old-fashioned whale-boat, combining the qualities mentioned above. The average length of such a boat is about 34 feet, its width 7 feet 5 inches, its depth amidship 33 inches. At the stern is a platform, measuring about 4 feet, fore and aft, on which the captain stands to steer; this is 6 to 8 inches below the gunwale. Another platform extends the whole length of the boat's bottom, from the afterpart of which the seine is set. In the bow is still another platform, on which stands the man who hauls the cork-line. There are four thwarts or seats, a large space being left clear behind the middle of the boat for the storage of the seines. Upon the starboard side of the boat, near the middle, is arranged an upright iron support, about 18 inches in height, to which are attached two iron snatch-blocks used in working the purse-ropes.‡ Upon the opposite side of the boat, generally near the bow

* The three-masted schooner Carrie D. Allen, of Wellfleet, Capt. Darius Newcomb, arrived at Gloucester June 18, 1874, with 900 barrels of mackerel. Only vessel of her class in the coast fisheries; 175 tons, carries 25 men. (Cape Ann Advertiser, June 26, 1874.)

† Capt. George Merchant, jr., of Gloucester, Mass., claims to have been the first to design and introduce the form of seine-boat now universally employed in the mackerel fishery, and which has been used to some extent in the menhaden fishery since 1857.

In 1856, while engaged in fishing for menhaden, he carried two boats, one of which was a whale-boat of the ordinary type. The latter, which he used for a "second boat," proved very serviceable—rowing and towing easily, and turning quickly—and was much better adapted for seining than the old-fashioned square-sterned seine-boats which were in general use at that time. Captain Merchant therefore conceived the idea that a decided improvement could be made in seine-boats by building them on the same general plan as the whale-boat, through making them somewhat wider than the latter, especially towards the stern, so that they would be better able to bear up the seine. Having decided on the dimensions required, Captain Merchant wrote to Mr. Higgins (now the senior partner of the boat-building firm of Higgins & Gifford, Gloucester, Mass.), who was then at Provincetown, desiring the latter to build a boat 21 feet long and according to the plan submitted, and which should be ready for the season of 1857.

Many of the old fishermen laughed at the idea of attempting to use a sharp-sterned boat for purse-seining, declaring that it would upset while the seine was being "pursed up," that it would tow under, and making other unfavorable predictions. Notwithstanding their croakings, they soon became convinced of the good qualities of the new boat, and in the following years hastened to adopt the same kind themselves.

‡ The first iron purse-davit (with wooden snatch-blocks), according to Captain Merchant, was invented and used by Capt. Henry Blatchford in 1858. With the exception of the blocks it was essentially the same as the purse-davit in use at the present time. Previous to this a wooden davit (usually an old one), such as were in use on the fishing vessels, was employed for the purpose of pursing up the seine. These davits were rigged out over the side of the boat, a place being cut in them three or four inches deep, so that they might fit over the gunwale of the boat in such a manner as to steady the outer end while the inner end was secured to the midship thwart by a grommet strap.

and stern, but with position varied according to the fancies of the fishermen, are fixed in the gunwale two staples, to which are attached other snatch-blocks used to secure additional purchase upon the purse-ropes. In the center of the platform at the stern of the boat is placed a large wooden pump, used to draw out the water which accumulates in large quantities during the hauling of the seine. The steering rowlocks, with the peculiar attachment for the tow-rope and the metallic fixtures described above, are manufactured especially for seine-boats by a firm at Middletown, Conn.

Until 1872 the seine-boats were always built in the lap-streak style; since that time an improved form of smooth-bottomed boats, built with battened seam, set-work, sheathed inside with pine, and with oak frame and pine platform, has been growing in popularity. The advantages claimed for this boat by the builders are: (1) Increased speed; (2) greater durability, on account of the more solid character of the woodwork and tighter seams; and (3) less liability to catch the twine of the nets by reason of the smooth sides. It is not so stiff as a lap-streaked boat of the same width, but in other respects is superior.

Since the general adoption of the purse-seine in the menhaden and mackerel fisheries, an account of which is given elsewhere, there has been a gradual increase from year to year in the size of the seine-boats, keeping pace with a corresponding increase in the size of the seines.

In 1857 all boats were 28 feet in length; in 1872 the length had increased to 30 feet, and in the summer and fall of the same year an additional foot was added to the length; in 1873 almost all boats which were built had a length of 31 feet, a few of 32 and 33; in 1874 almost all were 33 feet, as they were during 1875 and 1876, although some were made 35 and 36 feet; in 1877 34 feet was the most popular length, though one or two 38-foot boats were then built. Seven, eight, or nine oars, usually 13 or 14 feet in length, are used in these boats, besides a steering-oar of 16 or 17.

These boats last, with ordinary usage, six or seven years. At the close of the fishing season they are always taken ashore and laid up for the winter in a shed or under trees, and are completely refitted at the beginning of another season.

The seine-boats carried by many of the "menhaden catchers" south of Cape Cod and by some of the steamers are shaped like ships' yawls, square-sterned, smooth-bottomed, and batten-seamed, 22 to 26 feet long and 6½ feet beam. They are built at New Bedford, New London, Greenport, and at Mystic River, and cost about $125 each, the finest $185. The New Bedford boats are preferred by many fishermen.

The Cape Ann fishermen stow their seines in one boat, and in shooting the seine one end of it is carried in a dory.*

The arrangement of the thwarts is especially adapted for the mackerel fishery. There is some variation, however, as to the number of these in the different sizes of boats. In the size most commonly in use at the present time (1881) there are six thwarts, five of these being forward of midships and one 7¾ feet farther aft. The following are the general dimensions of the boat: 36 feet long over all; 7 feet 7 inches wide; 2 feet 8 inches deep. The bow thwart is placed 4 feet from the stem, and there is a space of 2½ feet between each of the five forward thwarts. The boat is ceiled to the gunwales and platformed inside. In the bow she has a raised platform, which comes up to the level, or nearly so, of the forward thwart, to which it extends, and is bulkheaded on the after end. The stern is covered over on the top of the gunwales, forming the stern sheets, this being 3 feet long forward of the stern-post, with a bulkhead on the forward side. Forward of this again, and a little below the level of the thwarts, is another platform, 3 feet in length, also bulkheaded on the forward side. On this the seine-master stands while steering the boat, and in

* Goode, History of the American Menhaden, p. 122.

it is placed the pump by which the boat is freed from water. The after portion of the boat between the two after thwarts is used for stowing the seine, this being a section 7¾ feet long by 7¼ feet wide. There are five rowlocks on either side, corresponding to each of the five thwarts. The purse-davit is placed on the starboard side and usually stepped in the midship thwart near the gunwale. At present, however, an improvement has been made in placing the purse-davit by stepping it in the thwart nearer to the center of the boat, it being placed at a distance of 18 inches to 2 feet from the gunwale. It is said that by this improvement the seine can be more easily pursed up, and the pursings taken over the gunwale of the boat without the use of a pry or lever, and also that there is less probability of the boat being capsized. The boats of the most recent construction have their purse-blocks on the port side, nearer the bow and stern than formerly, the forward being 2 feet aft of the stem, and the after one close to the upper stern sheet, about 3½ feet from the stern-post. Galvanized iron plates, each provided with a projecting eye, are neatly fastened to the gunwale, and the snatch-blocks are hooked into these eyes.

Until recently it has been customary to build these boats with a raised garboard, in imitation of the whale-boat (whale-boats are constructed in this way by some builders), but in 1881 a Gloucester firm of boat-builders, the principal, if not the only constructors of this style of boat in the United States, built them with smooth garboards, which have given better satisfaction than the old style. They are remarkably well adapted for swift rowing and for towing. Both of these qualities are very desirable, especially the latter, since they are frequently towed at a rate of 10 or 12 knots. The thwarts are double-kneed but not dunnaged. The boat is steered with an oar similar to the whale-boat. On the port side are two oar rests in which the oars are placed after the seine has been shot. The after one of these is just forward of amidships, and the two are separated 8 feet.

The seine-boat is usually towed astern by a warp, a 2½ or 3 inch rope, 20 to 50 fathoms in length. When the vessel is making a long passage the seine-boat is hoisted upon the deck. Most of the larger vessels carry two seine-boats and two seines.* On the largest schooners these boats are both of a large size; in other vessels, one of them is usually a small one. In addition to the seine-boats, each vessel carries two dories. One of these is usually towed astern when the vessel is on the fishing grounds; sometimes both. They are taken on deck in rough weather, when making a passage, or when not required for use in fishing.† When a large catch is obtained at the last set of a seine for the trip, and more mackerel are secured than the barrels on board will hold, the dories are taken on deck and filled with fish. During the mackerel season it is a common occurrence to see, in any of the large fishing ports, vessels arrive with both dories piled full of mackerel.

THE SEINE.—Two kinds of seines are used. The large seine, used only in connection with the

* The steamer Novelty, built especially for the mackerel seine fishery, in the summer of 1885, carries four seines and four boats. The latter, when the steamer is cruising, are hoisted to davits, two boats being taken up on each side of the vessel.

† The following is the price-list of a reliable firm of boat-builders in Gloucester, Mass., for 1880:

Seine-boats, including pump, iron breast-hook, outside tow-iron, and iron stem-cap.

Smooth bottom, battened seam, 31 feet	$186 00
Smooth bottom, battened seam, 32 feet	192 00
Smooth bottom, battened seam, 33 feet	200 00
Smooth bottom, battened seam, 34 feet	210 00
Smooth bottom, battened seam, 36 feet	225 00
Galvanized rowlocks, with brass sockets, per set (8)	6 50
Pursing-gear	8 50
Patent steering rowlock with socket	1 25
Pursing-blocks, per pair	6 00
Towing iron and pin	2 00

largest kind of seine-boat, is 190 to 225 fathoms in length, and 20 to 25 fathoms in depth when it is hung, being deeper in the center of the bunt than at the extreme wings, one of which, the "boat end," is from 1 to 10 fathoms deep, and the other, the "dory end," varies from about 7 to 15 fathoms in depth.* It is made of three kinds of twine. The "bailing-piece," which is a section of the net occupying about 10 to 12 fathoms along the center of the cork-line, and having about the same depth as length, is made of the stoutest twine. Beneath this, and composing the remainder of the bunt and extending to the bottom of the seine, is a section knit of twine a size smaller. There is also a band of large twine, 15 meshes in depth, extending along the cork-line of the seine on either side of the bailing-piece to the extremity of each wing. The remainder of the net is made of smaller twine.

A seine 200 fathoms in length is usually about 1,000 meshes deep, both in the bunt and in the wings. The strongest twine is placed at those places where the seine is subjected to the greatest strain. On the cork-line are two or three sizes of corks, the largest being placed over the bailing-piece, the smallest generally at the ends of the wings. The cork in the middle of the seine is much larger than the rest, and is painted or covered with canvas in order that it may be easy to find the center of the net either night or day. To one end of the cork-line at the upper corner of the wing, which is first thrown out when the seine is set, is a buoy. The seine is hung to lines which are called the hanging-lines. The lead-line is placed as in an ordinary seine, and is weighted with sinkers about two ounces in weight, which are attached to it at intervals varying from a few inches to several feet. The arrangement of the pursing rings and bridle is described elsewhere. In a mackerel seine of 175 fathoms the bridles are about 15 to 18 feet in length, and the rings, which weigh 1¼ pounds and are 3 inches in diameter, are fastened to the middle of each bridle. The middle ring is on the bottom of the seine, opposite the middle cork already referred to, and is usually made of different metal from the other rings, or is larger, so that the center of the bottom of the seine can be easily found. Small galvanized-iron blocks or pulleys are now used to a considerable extent instead of rings, and are found much better adapted for the purpose, since the purse-line runs far easier through them. The purse-line extends through the rings; its center is marked by a line tied around it or tucked through its strands, but more frequently now by a brass swivel, into which the purse-rope is spliced, and which serves the double purpose of marking the center of the line and preventing it from kinking.†

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*Capt. Joseph Smith tells us that the depth of the seine-ends varies a great deal, according to the fancy of the fishermen. Some of the skippers prefer to have the ends of their seines "taken up" enough to make them very shallow, while others think a net with deep ends will fish the best.

†The following dimensions of an average-sized deep-water mackerel purse-seine have been supplied by Capt. George Merchant, jr., of Gloucester, Mass.:

Total length of seine when hung, 203 fathoms.
Depth, 1,000 meshes, or about 21 fathoms.
Size of mesh in all its parts, 2 inches.
Length of "bailing-piece" or "bunt," 500 meshes; size of twine, 12-9.
Depth of "bunt" or "bailing-piece," 500 meshes.
Length of "sides," each, 300 meshes; size of twine, 20-9.
Depth of "sides," each 500 meshes.
Length of "under," 1,100 meshes; size of twine, 20-9.
Depth of "under," 500 meshes.

The central section of the mackerel purse-seine, that portion composed of the bailing-piece, sides, and under, is generally spoken of as the "bunt," though the bunt proper constitutes only a small portion of it. Capt. Joseph Smith, of Gloucester, says that at present the whole center of the seine (including the bunt, sides, and under) is made of one size of twine, 20-12, this portion being 1,000 meshes square.

There is sometimes considerable difference in the length of the wing and arm of one end of the seine from that of the other, though some are constructed with both ends of equal length. Many of the seiners prefer to have the bunt of their seines a little to one side of the middle of the net. In such cases the ends are, of course, of unequal lengths.

When the vessel is not searching for fish the seine is stowed on a grating forward of the house, between that and the after hatch. This grating is a frame-work, about 8 to 10 feet square, made of boards from 4 to 6 inches in width, crossing each other at right angles. The boarding is supported on a frame-work of joists. The top of the grating is 4 to 6 inches above the surface of the deck. When two seines are carried, the grating must be wider. When the seine is stowed in the boat or upon the deck, it is always "salted down" to prevent it from rotting or burning. From a bushel to a barrel of salt or more is used, according to the necessity of the case. When the seine is thus stowed, it is often protected by a canvas cover.

When looking out for mackerel the seines are generally stowed in the seine-boats upon the platform arranged for that purpose between the two after thwarts. The cork-lines are stowed aft and the lead-lines forward, the seine always being set from the starboard side of the boat.

As has been stated, the small seine differs from the large seine only in its size, being from 150 to 175 fathoms in length and 10 to 12 fathoms in depth. These seines are used in shallow water, and those vessels which have gone to the Gulf of Saint Lawrence for the purpose of catching mackerel by this method have generally carried them.

Many of the large schooners carry two seines whether they have two seine-boats or not, since the deep seine cannot be used on rocky bottom in shallow water.

The seine is always passed from the boat to the vessel, and *vice versa*, over the roller upon the port side, which has already been described. To transfer the seine from the vessel to the boat requires five or more men. The operation can be performed in from 15 to 30 minutes. To haul the wet seine from the boat to the vessel is a somewhat laborious task, but as less care is required than in stowing it in the boat, less time is usually needed to perform this operation.

BAIT.—Mackerel seiners usually carry a small supply of bait for the purpose of tolling the fish to the surface and, incidentally, of catching fish with the jigs when they are not schooling.

It may also be mentioned that a border of stout twine (size 20-9), 15 meshes deep, extends along both the top and bottom of the wings and arms of each end of the net.

Size of the first wing, 125 yards long in the web, 1,000 meshes deep; size of twine, with the exception of that for the border, 16-6, hawser-laid; size of first arm on the same end of the net as the wing just described, 125 yards long in the web, 1,000 meshes deep; size of twine, exclusive of that in the border, 20-6, hawser-laid. Size of wing No. 2, on the other end of the net, 150 yards long in the web; depth, 1,000 meshes; twine, 16-6 hawser-laid. Size of arm No. 2, 150 yards long in the web; depth, 1,000 meshes; size of twine, 20-6, hawser-laid, exclusive of the border.

Captain Merchant writes: "We always use for hangings 6-thread manila right and left rope. In Boston factories they sometimes use 9-thread manila for bridle-rope, or 'loops,' as they are occasionally called." These loops, to which the purse-rings are attached at the bottom of the seine, are one part of the hanging-rope, and are made three fathoms long, the spaces between them being the same distance. Thus it will be seen that the purse-rings are about 6 fathoms distant from each other. Captain Merchant adds: "We use the left-laid rope for loops and the right for the sinkers. The loops are formed by separating the ropes at what are called the 'bridle hitches.' Only one ring is attached to a loop. The net has attached to it, when completed, 800 No. 1 corks, 1,200 No. 2 corks. The No. 1 corks, which are the largest, are placed in pairs in the center of the bunt of the seine, at a distance of 10 inches between the pairs. The 'middle cork,' however, is made of three, joined together and covered with canvas. This is for the purpose of determining the center of the seine when it is being overhauled. The No. 2 corks are secured to the upper part of the seine upon the wings and arms, being placed 15 inches apart. From 65 to 75 pounds of lead sinkers, which weigh from 2½ to 4 ounces each, are placed at the bottom of the seine. None of these are put in the bunt, but are scattered along the foot of the wings and arms, being nearest together close to the ends of the net. The rings used at present are made of galvanized 1-inch iron, and weigh about 2½ pounds each; with the sinker-leads they make about 160 pounds weight attached to the bottom of the seine. One and three-fourth inch hemp rope is used for the purse-line, the length of this being generally about 25 fathoms more than that of the seine. In hanging the seine it is 'taken up' at the ends, so that one end is 7 fathoms deep while the other is only 1 fathom deep, though the middle of the net will go down 125 feet. The first or deepest end is called the 'dory end' or 'outer end,' and the other is known as the 'boat end' or 'inner end.' As will readily be understood by reference to the preceding dimensions of the purse-seine, the difference in the depth of the several sections of the net, when hung, is due solely to the 'taking up' in the process of hanging it, since the webbing is of the same depth throughout. The purse-seines, like many other things, are being improved. Those we are making now (for the mackerel fishery) are much lighter than we have been making them in former years, and can be handled with greater ease and rapidity."

Sometimes they toll the school alongside and spread the seine around the vessel, and after she sails over the cork-rope and away to leeward, the net is pursed up and the fish captured. It is often the case, too, when mackerel are moving rapidly, for the men in the dory to throw bait ahead of the school, and while the fish are thus induced to stop, the seine-boat circles around them, the net is thrown out and while yet engaged in feeding, the fish are inclosed in the big purse. Many good catches are obtained in this way. The favorite bait is slivered and salted menhaden, of which each vessel carries 5 to 10 barrels when they can be procured. Most of the vessels, however, at the present time, depend entirely upon small mackerel, which they catch and salt. The bait-mill, bait-boxes, and bait-throwers are similar to those used in the mackerel-hook fishery, and are used in the same manner.

METHODS OF SEINING BY DAY.—The following description of the method of seining mackerel is mainly from the pen of Mr. J. P. Gordy: When a vessel is on the fishing grounds and there are no signs of fish, if the weather is favorable, a man is stationed at the mast-head on the lookout, while the rest of the crew, excepting, of course, the man at the wheel, lounge lazily around, amusing themselves as they feel inclined. If a whale is seen blowing or a vessel is "putting out her boat," the man at the wheel steers toward them. The skipper is usually on deck directing the evolutions of the vessel, and is consulted before any change is made in the course of the vessel. When signs of fish begin to be numerous, and sea geese and gannets are plenty, and whales and porpoises show themselves frequently, the "fishy men" of the crew stop lounging and begin to survey the surface of the water intently. At such times one can count half a dozen here and there in the rigging, carefully observing the movements of other vessels, if any of the fleet are in sight. "There's crooked actions, men," the skipper exclaims, meaning that some vessel in sight suddenly alters her course, and that she is either on fish herself or sees another vessel that is. When one school appears, another is likely to be seen, and when a vessel has "crooked actions," those who observe them bend their course in the direction in which she is sailing. When a man sees fish, he shouts, "I see a school." "Where?" asks the captain. The direction is indicated. "How does it look; is it a good one?" He wants to know whether they are tinkers or whether the fish seem large. If they are abundant he will wait until he gets a "sight" at a good school. Much attention is paid by the lookouts to the manner in which the school of fish is moving. The seiners prefer those schools which are "cart wheeling,"* or going round and round in circles in a compact body, in the act of feeding. Fish which are "cart wheeling" can be surrounded with a seine much more readily than those going straight ahead in one direction.

If the man who has found the school is not experienced, the captain examines it for himself, and if satisfied that it is a good one he shouts, "Get in the seine-boat; look alive, boys." As a pack of school-boys jump from an apple tree when the indignant owner appears, so eleven men leap into the seine-boat one over another, as if they had meant to jump overboard but by accident had reached the seine-boat instead. The captain takes his place at the steering-oar. Two men sit on the forward part of the seine and one at the cork-line, ready to "throw out the twine" when the captain gives the word of command. The remaining seven row swiftly and silently until the fish disappear or the captain orders them them to "stop rowing." All the while the captain is eagerly watching the fish, noticing which way they move and how fast. Before beginning to put out his twine, he wants to get near enough to enable him to make the wings of the seine meet around the school. He must, therefore, keep far enough away to prevent the head of the school from striking the seine until it is nearly pursed up. He calculates the speed of the fish, and sets the seine in such a manner that by the time the school gets thoroughly within the circle of the net he will be able to come

*This habit of circling, which the mackerel performs, is also called "milling" by the fishermen.

round to the starting point and completely encircle them. If he fails in this, the wings of the seine must be towed together before it can be pursed up, and in the time thus occupied there is a chance of losing the fish. A skillful skipper rarely fails in making the ends of the seine meet. In seining on George's, or any other place where there is a strong tide, it requires much skill and judgment to set the seine in such a manner that it shall not be tripped and thrown out upon the surface of the water. Under these circumstances, to prevent "tripping," the seine should be so set that the bunt of it will be in the direction from which the tide runs; the force of the tide then aiding the act of pursing the net.

When the skipper is near enough to satisfy the conditions of the above problems he orders the men at the seine to "put out the twine." They begin their work, the oarsmen in the mean-time rowing as fast as possible. The skipper steers the boat around the school in such a manner that when the seine is fully out the cork-line approximates more or less closely to the form of a circle. Two of the men who did not get in the seine-boat now appear on the scene of action in the dory in which they have closely followed in the wake of the seine-boat until the act of setting begins. As soon as the first end of the seine has been thrown overboard they row up to it and seize the buoy at the end of the cork-line, which they hold until the seine-boat has made a circle, merely rowing fast enough to keep the end of the seine in its place and to prevent it from swagging. When the seine-boat has completed its circle, it approaches the dory, which is holding fast to the buoy. When the two ends of the seine meet, the men in the dory get into the seine-boat to assist in pursing; sometimes, however, the ends do not meet, and in this case they are brought together by means of a line, about 20 fathoms in length, which is always taken in the dory and is fastened by the men in the dory to the buoy and carried to the seine-boat.*

The work of "pursing up" is now to be performed with all possible speed. Until this is begun the seine is in the form of a hollow cylinder, and the fish, in order to escape, have only to dive down and swim away under the lead-line. In pursing, the bottom of the seine is to be closed up, and in this operation the saying of the men, "A man who won't pull every pound he can and *an ounce more* is not fit to be a fisherman," is fully exemplified.

The men stand six in one end of the seine-boat and seven in the other end, holding the two ends of the purse-line, which, having passed through the rings in the bridles on the lead-line of the seine, pass round the two blocks of the purse-davit and through the snatch-blocks on the opposite side of the seine-boat, one of which is forward and the other aft. One of the uses of the bridles now appears. As soon as the men in the seine-boat commence pursing up the seine, the rings, which before this have been hanging downward below the lead-line, now extend the same distance laterally from this line. We have only to remember that they all extend toward each other to see that they considerably diminish the open area at the bottom of the seine. To be sure, the spaces between the bridles are open, but the fish are not likely to escape through these, for in such an attempt many of them would strike the bridles and finding such obstacles would turn, hoping to find an outlet in some other direction.

The men stand, as has been said, when pursing up the seine, six in one end of the boat and seven in the other. They are divided into three rows of three and one of four men. On the side

* Capt. Nelson A. McKenney, of Gloucester, states that two men usually go in a dory, one of whom pulls a little while the other holds to the end of the seine. If the one having the oars is an expert (and as a rule only old hands do the rowing), he will quickly and dexterously turn the dory as the seine-boat approaches "close to," so that the latter may shoot alongside of the former in such a manner that the purse-line held by the man in the stern of the dory may be easily transferred to the larger boat. As soon as this is done both of the dorymen jump aboard the seine-boat and assist in "pursing up" the seine.

of the boat next to the seine are two rows of men facing each other, and pulling; one row on the end of the first line that passes over the blocks in the purse-davit nearest them, the other on the other end of the purse-line passing over the other block of the davit. Each end of the purse-line passes around another block, which changes the direction of the line, and two rows of men on the side of the boat away from the seine stand back to back, pulling on the purse-line, its direction having been changed by the pulleys.

As previously remarked, the seine before being pursed up is in the shape of a hollow cylinder. A strong tide may make it take the form of a hollow frustum with a slit in its side. Its longer area is at the bottom. In such a case the slit is wider at the bottom and grows narrower toward the top, until it vanishes at a point where the two ends of the purse-line bring the seine together at the purse-davit. Then the purse-weight comes into play. This is "reeved out" to the two end lines, and its weight brings the two ends of the seine together, closing up the slit and destroying the frustum shape of the seine. If this were not done the fish might escape at the side as well as at the bottom.*

When the seine is pursed up it is in the form of a bag, the bottom of which does not hang freely, for it is bent upward, having been drawn up by the purse-line near the side of the boat, and during the operation of pursing up the boat is pulled nearly into the center of the circle made by the corks on the upper edge of the seine. Occasionally, when there is a current, the boat is brought up against the corks in the bunt of the seine. The object is now to get the fish, if they have any, into such close quarters that they may be taken on deck. To this end the larger part of the seine must be pulled into the seine-boat, and this operation, called "drying up," now begins. The seine is taken up entirely if there be no fish, partly if the school has not escaped, and the net is so drawn up that the "bailing-piece" will inclose the fish at last. The position of this part of the seine being marked by the central cork already spoken of in the description of the seine, it is of course not difficult to bring it around the fish. The experienced fishermen can also quickly tell, either *night or day*, when the bunt of the seine is reached in the process of drying up, since the difference in the size of the twine of which the bailing-piece is made and that of the other parts of the net is readily detected.

If any fish have been caught, especially if the school is large, the skipper and three or four men go in the dory to the vessel to help the cook, who is the only man on board, to bring her alongside of the seine-boat. If the school is very large the dory is rowed to the vessel as rapidly

*It should be stated that the large purse-weight is at present seldom used. The tide is rarely so strong as to make it useful, and even then the process of "reeving" is likely to be so tedious as to make the loss of time more than balance the gain through its use. According to Capt. Joseph Smith the majority of the mackerel seiners now use two purse-weights, each of 75 or 100 pounds weight, instead of the old-fashioned "Long Tom," which usually weighed 150 pounds. The two weights above mentioned, being so much lighter than those formerly employed, can be handled by one man, and rove on the purse-line very much quicker than if the heavier, or "double weight," as it is called, was used. These small purse-weights are provided with one block, and each weight has a line attached of sufficient length to reach the bottom of the seine. The time occupied in reeving them on the purse-line rarely exceeds fifteen or twenty seconds. One of the purse-weights is most commonly used on the "boat end," or the end of the seine last thrown out, for the reason that this part of the net has not usually time to sink down to its full extent before the pursing begins. A weight is more rarely used on the end of the seine which is first thrown out, and, consequently, has had time to sink to its extreme depth; though sometimes, on account of the current, or for some other reason, it may be found necessary to put the purse-weight upon this end, as well as upon the other. In using one large weight as formerly, it would be necessary, of course, to always put it on both ends of the purse-line of the seine, but in having two weights one can be attached and run down on either end of the purse-line as required. That sinks it and keeps the net deep, and if both ends "purse high" a weight should be put on each end. The ends of the purse-line, when the weights have been run down, in the manner above stated, will stand out from each other, something in the form of the letter A, both parts coming nearly together at the purse-davit and being separated several fathoms at the lower part of the net, as the first purse-rings are attached about 15 fathoms from the ends of the seine.

as possible, and the second dory is rowed back to the seine for the purpose of holding up the bunt, since a school of 500 barrels may sink both seine and seine-boat if left without assistance. This, however, rarely occurs, and it generally happens that the school either is small enough to be dipped into the dory and to be taken to the vessel, or that the seine-boat without any assistance is capable of managing them until the vessel is brought alongside.

While the fish are being caught the cook has charge of the vessel; if it happens to be about meal time he attends to the cooking as best he can, but whether the cakes burn or not the vessel must be cared for, and he generally divides his time between the forecastle and the wheel. If he is preparing dinner and is able to, he continues his cooking, taking charge of the vessel at the same time.

The vessel usually "lays to," with the jib to windward, not far from the seine-boat; and perhaps, as the cook sits at the wheel, he has a basin of potatoes before him, which he peels while he is eagerly watching every movement of the seine-boat, trying to ascertain whether his mates are successful, and, if so, to what degree.

When the dory has been rowed aboard, the men at once take measures to bring the vessel alongside of the seine-boat. The evolution of shooting alongside of a seine-boat (described elsewhere) calls into play all the skill of the steersman. The vessel must approach so near that a rope may be thrown to the men in the seine-boat, and in such a manner that she will move slowly enough not to tear the seine as it is pulled along, before the schooner is "bowsed to the windward" and her motion ceases.

The cork-line is then taken over the side of the vessel and made fast by "stoppers" along the rail. This having been done the process of drying up is resumed, and the fish are gathered together in a compact body so that they can be dipped out upon the deck. When the fish are to be taken on deck the men are distributed as follows: Three or four are employed in hoisting the fish by means of a large dip net attached to the main and fore staysail halyards; the captain directs the movements of the net, holding its long handle, and shouting "Hoist!" when it is about half full of fish two men standing by the rail empty the dip-net on the deck.

When all the fish have been bailed out the seine is overhauled and salted. In the mean time most of the crew are making preparations to dress the fish. If the school is large, the crew, cook and all, unless it is just at meal time, begin the work as soon as the fish are ready; if the catch of fish is small, and there is a prospect of getting another set that day, a part of the crew take the seine out of the seine-boat to mend it, if necessary, and lay it back in an orderly form so that it may be thrown out without difficulty.

The operation of setting a seine around the school and pursing it up usually occupies from ten to twelve minutes, though it is claimed by some expert fishermen that they have done it in seven minutes. Under unfavorable circumstances it may be nearly an hour from the time the first end is thrown out until the "pursings" are on the boat. This delay is usually caused by a strong tide, such as is generally found on George's. The catch of a purse-seine may vary from one barrel to five or six hundred barrels. The seine may be set eight or ten times in the course of a day without getting any considerable quantity, or perhaps no fish, the mackerel escaping by diving under the "lead-line"; and then a more fortunate set will secure more fish than can by any possibility be taken care of by the crew of the vessel. Under such circumstances it is customary to set a flag from the main-topmast head or main peak. This is to indicate to vessels which may be in sight that more fish have been caught than can be taken care of, and that the skipper is willing to dispose of some of them. This is called "giving the seine away." Sometimes the fish are given away to

be dressed on shares, and at other times they are given away without expectation of return.* An ordinary crew can dress and salt at one time about 100 barrels of small mackerel or 200 barrels of large ones.†

Very large quantities of fish can be taken care of in a short time. Vessels have been known to leave New York on one day and return the next day with 200 to 300 barrels of fresh mackerel, while some Gloucester vessels in the course of a week have caught and salted 500 or 600 barrels, landing two or three cargoes during that time.

It sometimes happens that, when a large school of mackerel has been taken in a seine, the fish press down so hard on the bottom of the net that the fishermen find it difficult, if not impossible, to gather in on the twine sufficiently to "dry the fish up" enough to bring them to the surface. It has been found, however, that by throwing coal ashes into the water alongside of the seine the fish are caused to rise to the surface, being frightened by the whitish appearance which the ashes give to the sea. When the mackerel rise the twine can be readily drawn in. The same result is secured in another way by the menhaden fishermen when they have a large school of menhaden in their seine alongside of the steamer. If the fish hang heavy on the twine, one or two quick turns are given with the propeller and the frightened menhaden rise quickly to the surface. This method is called "whirling 'em up."

METHODS OF SEINING BY NIGHT.—The practice of fishing for mackerel—purse-seining in the night-time—which has recently come into quite general use, was first attempted, so far as we can learn, prior to 1874. Captain Merchant says that night seining for pogies was in practice as early as 1864, but that up to 1874 no mackerel of any amount had been taken in this way. In 1874, and up to 1877, a large quantity was taken. Since the latter date night seining has been the general custom in the latter part of the summer and fall. The honor of introducing this method of fishing is assigned to a number of the more enterprising captains of the mackerel schooners, and, in consequence, it is difficult to say here who should receive the credit for the innovation. As is well known to all who are familiar with the sea, the water, on dark nights, frequently exhibits a remarkably brilliant phosphorescent display. At such times objects moving in the sea can be distinctly traced by the illumination which they leave behind, and schools of fish rising near the surface can be readily seen. Indeed, on some occasions so remarkable is the phosphorescence thrown out from a large school of fish that it frequently seems to light up the surrounding darkness. From this reason, and the fact that the fishermen, by long experience and close observation, can accurately

* The schooner Oliver Cromwell, while on a mackerel cruise recently, had a curious incident befall her. Her seine being out, a school of mackerel suddenly turned, and, making for the seine, took it down. A vessel in the neighborhood immediately answered a call for assistance, and swept her seine under that of the Oliver Cromwell. Twenty-three hundred dollars' worth of mackerel were secured, the two vessels dividing the catch, the fish selling on an average at nine cents each. The bunt of the seine belonging to the Oliver Cromwell was badly rent by the sudden rush of the fish or more would have been secured. This is the second time the seine of the Oliver Cromwell has experienced similar treatment, losing all the fish at the first on account of the seine giving way and there being no help near. (New Bedford Mercury, 1875 (?).)

Captain Merchant writes us that "in 'giving the seine away to another seiner,' we never expect to get any return of fish, as it is supposed the receivers will do the same by us as we have done by them whenever they may have the chance. We are therefore satisfied if proper care is taken of the seine. We expect those vessels to return a part of the mackerel who are hook and line fishing and have no seine to catch them with."

† A much larger quantity could be taken care of were it not for the fact that mackerel, after being kept a certain length of time, grow "soft," and rapidly become unfit for food. This change takes place much sooner when the weather is warm than at other times. The fishermen, however, are generally able to tell pretty accurately how many fish can be dressed and salted before they spoil. When good catches are made for several days in succession the fishermen get no sleep, being constantly employed night and day in taking and curing the fish. The above remarks apply more particularly to the methods in use prior to the general adoption of the mackerel pocket. At present all mackerel vessels are supplied with a "pocket," and since the fish can be kept alive in this for a considerable length of time, it follows, of course, that a part of the catch is seldom given away.

determine the kind of fish which he may see sporting at night, he is thus often enabled to learn the whereabouts of certain species, such, for instance, as the mackerel and their abundance, even when they do not come to the surface during the day. The mackerel is a remarkably capricious fish, and perhaps for many days in succession its presence cannot be detected in its favorite haunts while daylight lasts, and the fishermen therefore seeks for it in vain, but as soon as the sun sets and darkness appears over the sea the schools rise to the surface and the fish continue to disport themselves in this manner until near daylight, when they again sink out of sight.

For many years after the introduction of purse-seines it was considered impracticable by the fishermen to catch mackerel in the night, but at last some of the more adventurous skippers, having a favorable opportunity for night fishing, and deeming it possible to catch the mackerel, made an attempt and met with even better success than they dared to anticipate. Thereafter they followed up this method of fishing whenever a good chance occurred, but as it usually resulted greatly to their personal success, as well as increased their reputation among their fellow fishermen, on account of the additional amount of fish caught, they were by no means anxious to tell that part of their catch was made in the night, since, if they did so, all the other mackerel fishermen would at once come directly into competition with them. As a matter of course, however, the fact of mackerel being seined at night could not long be kept a secret, and the result was that one after another began to adopt this practice until in the fall of 1881 it reached its climax, nearly every vessel in the fleet engaging to a greater or less extent in night fishing.*

Previous to this time the public at large were not, it seems, aware that such large quantities of mackerel were taken in the night, though it was on record that night fishing had been previously attempted, and with good results.†

The method of seining mackerel in the night is as follows: The vessel being on the fishing-ground, if the night is favorable, she is allowed to sail slowly ahead while a man goes aloft to the foremast-head and keeps a lookout for the fish. If the signs are peculiarly favorable, perhaps two or more men may be aloft for this purpose. These lookouts are the men who have the watch on deck, and, *not infrequently, the skipper may be one of them, his ambition to succeed often impelling* him to remain up during the entire night, constantly keeping on the alert for fish and watching the movements of surrounding vessels. The remainder of the crew—those having a watch below—are thoroughly prepared and dressed in their oil-clothes ready to jump into the seine-boat at a moment's warning. If the fish are not seen in the first of the night, the men off duty lie down on the cabin or forecastle floors or stretch themselves on the lockers, and endeavor in this way to get what sleep they can, unless, indeed, they may be busy on deck in caring for the fish taken the

* Mr. A. Howard Clark, writing under date of October 28, 1881, says: "During the past few weeks the mackerel fleet have taken some good hauls during the night, as the fish have been difficult to catch by daylight but have rarely failed to show themselves on dark nights. When the moon shines it is impossible to see them, but when the night is dark or starlight they can be plainly seen from the mast-head, and sometimes from the vessel's deck. Heretofore, in night fishing, the methods have been the same as by day, but recently, owing to the difficulty of seeing the fish from the deck or the boat the lookout at the foremast-head has given directions to the men while setting the seine. In this method the seine-boat is towed astern of the vessel, and when ready to 'give 'em twine' the dory is allowed to drift astern with one end of the seine while it is being thrown out from the seine-boat. When ready to go around the school the order is given from the mast-head to 'go ahead;' the seine-boat is cast loose from the vessel and the seine brought together in the usual manner. Still another improvement in the methods is likely soon to be adopted in this night seining, and that is in the use of large lanterns to show their position to the men while setting for them. The schooner Northern Eagle tried this new method last Tuesday night and found it to work splendidly. It was probably the first attempt to use lanterns for such a purpose. Two schools of mackerel were secured, one at 10 o'clock and the other at midnight, both together yielding 160 barrels. The lantern was the ordinary large signal light used by fishing vessels."

† We hear of one vessel with a catch of 100 barrels in one week, and of several with catches ranging from 30 to 60 barrels. Another vessel made a good haul in a seine, one moonlight night recently, a new feature in this fishery. (Cape Ann Advertiser, October 19, 1877.)

night or day previous. When a school of fish is seen by the lookout, he at once shouts "I see a school!" If it is the skipper who first descries them, he gives directions to the man at the wheel how to steer in order to approach them. If not, the man who first reports the school is asked in which direction it bears from the vessel. He also directs how the course shall be laid in order to approach close to the body of fish. In the mean time the men below, having been hurriedly awakened, rush on deck and quickly take their places in the seine-boat and dory which are towed alongside or astern. If the mackerel "show up" well and can be plainly seen by the men in the boat, the latter is cast off as soon as the vessel approaches close to the school, and the seine is set and pursed up in the same manner as has before been described; though it frequently happens that, owing to the darkness of the night, it is quite difficult to bring the ends of the net together with such a degree of certainty and success as it is generally done in the day-time. Of late, however, the custom of carrying a light in the dory has been adopted in order that the skipper, who steers the boat, may determine the position of the end of the seine first put out and therefore be enabled to make a circle with a great deal more accuracy than he otherwise could. It often happens that fish can only be seen by the man at the mast-head, and in such cases the vessel is usually hove to near the mackerel, and the lookout directs the men in the boat how to row in order to surround the school. Another method, we are told, has been occasionally adopted when the chance for its success is promising. If the wind is sufficiently moderate the lookout at the foremast-head may direct the course of the vessel in such a manner that nearly a complete circle may be made round the school of fish. In this case the seine boat remains fastened to the stern and is towed along by the vessel while the men in her throw out the seine in obedience to the order given by the man at the mast head. At the proper time she is cast off and proceeds to close up the circle by bringing together the ends of the seine. The dory is cast off and allowed to remain at the end of the seine as usual until the other end is brought around to her. An evolution of this kind, of course, requires the most skillful seamanship for its success, and also remarkable qualities of adaptability in the vessel.

Night fishing, says Capt. Joseph Smith, can only be carried on in reasonably moderate weather. The boat is usually towed alongside of the vessel, the painter being fastened to the outrigger. When a school is seen, the men jump into the boat, each taking his station, and at the proper time the boat is cast off and proceeds to set the seine if the fish "show up" in a promising manner. Sometimes, however, the school of mackerel may sink suddenly after the boat leaves the vessel's side, and, in consequence, the fishermen are not able to set their seine. As a rule the man on the lookout aloft reports the school of fish and indicates the direction in which it is and tells about how far it is distant. After the boat leaves the vessel's side, however, the captain, or seine-master, who steers, takes charge of her, and when the boat approaches near the fish, which may be seen by the phosphorescence in the water, he gives the order to put out the seine as his judgment may direct. On special occasions this method may be somewhat varied, but the usual practice of setting a seine in the night is the one described above. Sometimes a portion of the net is set from the boat while towing astern of the vessel; or, again, even while the boat is towing alongside. In the latter case the towing rope is fastened to the boat some distance aft from the stem, so that she will keep from the schooner's side some 10 or 15 feet. The oarsmen have out their oars ready to pull whenever the man aloft gives the order for them to cast off. These methods of setting the seine, however, are only adopted when the fish do not *show* plainly, so that they can be seen by the men on the vessel's deck, or in the boat; it therefore becomes necessary for the man on the masthead to give the requisite orders for throwing out the seine as well as to direct the wheelsman how to steer the vessel until the boat leaves the side.

Captain Smith has never known a vessel to make a complete circle around a school of mackerel while towing the seine-boat from which the net was being thrown out, but thinks it probable that it may have been done.

A lantern is carried both in the seine-boat and dory, the one in the former always being kept darkened or out of sight until the seine is set, since a light would so blind the men in the boat that it would be difficult for them to perform successfully the work of setting the net.

When a school of mackerel has been taken in the seine and the net is *pursed up*, a signal is made by the crew of the seine-boat, who have a lantern, so as to attract the attention of the men on board of the vessel, who immediately bring the latter near the seine-boat. The skipper and three or four of the crew then go on board the vessel in the dory and bring the schooner alongside the seine-boat, performing this evolution in the same manner as it is done in the day-time. The lantern, which is always carried in the seine-boat, enables the skipper to find her without any trouble. Much vexatious delay and difficulty, however, sometimes occurs in consequence of the light carried by the seine-boat's crew being extinguished. In such case it is not only hard, but sometimes impossible for the men on the vessel to find the seine-boat, since on a dark, windy night she cannot be seen more than a few rods distant.

It is claimed that the practice of using a large lantern to attract the fish nearer to the surface of the water than they usually come, so that they can be more plainly seen, has met with decided success, and it is believed that there is reason for anticipating considerable improvements in this respect hereafter. In alluding to this matter a writer in the Cape Ann Advertiser, November 4, 1881, says:

"It would not greatly surprise us if the mackerel fleet, next year, were supplied with powerful calcium lights, to be carried at the masthead, and that the fishery will be extensively prosecuted in the night-time. Surely the signs of progression are manifested in almost every branch of the fisheries, and brains are rapidly coming to the front and making themselves manifest. A year ago who would have dreamed of catching mackerel in the night-time? Now it is fast becoming a reality."

As may be readily inferred, this practice of night fishing is one which calls for great endurance and hardihood on the part of the fishermen who engage in it. It frequently happens, when good catches are made for days and nights in succession, that the men get no rest whatever until they are thoroughly worn out by their constant labors and vigils and are scarcely able to refrain from falling asleep even when engaged at their work. Nor is the work on the fishing ground all they have to do. When a fare is obtained, all sail is made upon the vessel and she is driven as swiftly as possible for the home port, where the fish are landed, new supplies taken on board, and again the men go to sea without, in the mean time, having an opportunity of visiting their homes or of securing the rest they so much stand in need of. So sharp is the competition in this fishery, and so eager are the fishermen to "make hay while the sun shines," that is, to improve every opportunity during the short season while the mackerel can be taken, that the only limit to their labors is when nature is no longer able to sustain the extraordinary drafts that are made upon it. The following notes written by Capt. S. J. Martin will serve to give an idea of the continued labor and consequent fatigue which the fishermen endure:

"Our mackerel fishermen have 'drove business' this season. I know a number of cases where vessels have arrived in the morning with 300 barrels of mackerel, have landed the fish and gone out again the same night. The schooner Fleetwing caught 210 barrels of mackerel; came into Gloucester with them all on deck; hired twenty men who had the fish all dressed and salted at two o'clock the following morning. The vessel's crew went home to sleep; went out again the same morning at eight o'clock.

"Schooner William M. Gaffney came in here with 450 barrels of mackerel, of which 150 barrels were fresh on deck. The men had not been to sleep for two days and nights, and were nodding while putting the mackerel in the barrels. They got the mackerel all salted at four o'clock in the afternoon. Captain Smith then told the men to go home and rest till morning, but to be down the first thing after breakfast, as he wanted to get the mackerel out and go to sea in the evening. This they did."

The success of the night fishing was quite marked in the fall of 1881, as has been indicated above, and as the following newspaper paragraphs will show:

"Several of the mackerel fleet have made night hauls recently, some of them securing as high as 200 to 300 barrels at one setting of the seine. The operations are conducted by a lookout stationed at the foremast-head of the vessel, who gives the orders to the boat's crew in charge of the seine, as in the night-time the motions of a school of mackerel cannot be seen from the boat in pursuit of the fish, nor from the deck of the schooner."

"Schooner Henry Friend took 140 wash-barrels of mackerel at one haul Sunday night October 16."

"Schooner Phantom went out Sunday morning, and about 11 o'clock p. m. discovered a school of mackerel on Middle Bank, and getting her seine out secured ninety wash-barrels. The night was very dark, and lanterns were found necessary to conduct the seining operations and find the way back to the vessel."

In regard to the night fishing for mackerel in the fall of 1881, Captain Martin writes as follows:

"Seven-eighths of the mackerel taken since the 10th of September have been caught in the night. Catching mackerel in the night is done with great difficulty. Sometimes the vessel goes away from the boat. There were two such cases this fall. Schooner Everett Pierce's boat went out and set around a school of mackerel, and the seine was full of fish. At this time a squall of wind came and blew the lantern out, and the two men on board of the vessel lost sight of the boat. The men were in the boat from 11 o'clock at night until 5 o'clock the next morning. They were obliged to cut holes in the seine in order to let the mackerel go out so as to save the net, for if the mackerel died the seine would have been lost. The crew of the Minnehaha, of Swampscott, had a similiar experience the same night. The darker the night the better it is for seining, since the water will 'fire' more. When watching for mackerel one man is on the mast-head. He can see a school from the mast-head when he could not see it from the deck of the vessel. Sometimes the fish may be seen from the deck, but when the men get in the seine-boat they are not able to see them. A man on the mast-head can see them all the time. He gives orders to the men in the boat which way it is best for them to go. Captain Martin, of the schooner Northern Eagle, saw a school of mackerel one night. They could not see them plainly, so the lantern was held up, when the mackerel could be seen from the boat. They then set their seine and got 150 barrels of mackerel. When the fish saw the light they came nearer the surface. Sometimes when the mackerel are close to the surface it is not necessary to have a man on the mast-head since they may be seen from the deck and seine-boat. It is not very often that the mackerel come to the surface during the fall of the year. Sometimes on a calm night in summer you can hear them rushing, but not often. Catching mackerel in the night is hard work. Say, for instance, you get 200 barrels a night, and perhaps it is the latter part of the night, it will take all day to dress and salt them, head them up, and get them below. Thus if another dark night follows, all of the men are on the lookout for another school. After looking for, perhaps, two hours, some one (most likely the man on the mast-head) gives the alarm, telling those on deck where the fish are. The vessel is then kept in the direction of the school, and as soon as they can be seen from the deck the men jump into the boat, shoving off from the vessel,

while the captain stands up with the steering oar in his hand, looking for the school. Soon he espies the fish, or the man on the mast-head sees them, and tells the men in the boat which way to go. When the captain sees them he sings out: 'I see them, boys! Pull away! Pull hard, the mackerel are going fast.' When the boat is in the right position the captain shouts, 'Give 'em twine,' and away goes the seine, three men heaving it out as fast as they can. When they are nearly around the school they sing out: 'Give them twine.' Sometimes they make a good circle so that the seine-boat and dory will meet, but it is difficult to do this in the night. When the seine comes together they haul in on the purse-line, and when the net is pursed up and they see the mackerel, signs are made for the vessel, which comes alongside. The lines are hove from the boat and the mackerel are 'bailed in' on deck and dressed."

SETTING A SEINE AROUND A VESSEL.—The following description of the manner of setting the seine round the vessel is quoted from the Cape Ann Bulletin:

"It is a well known fact that at times, for days and sometimes weeks, no mackerel are to be seen 'schooling' at the surface of the water, although that they are present on the fishing ground can be easily proven by heaving a vessel to and 'throwing bait' for a short time, when the fish will rise from the depths and remain alongside of the vessel as long as the operation of feeding is continued. Again, when making their passage, in coming North or in returning to their winter haunts, the fish are sometimes very difficult to catch, even though swimming near the surface of the sea, for the reason that they generally travel at a rapid rate; but by scattering bait across their line of travel and heaving the vessel to they can be stopped, though sometimes but for a few moments. At such times seiners take care to keep the seine-boat in readiness on the port side of the vessel (the leeward side when hove to), hauled up snug to the vessel, that no delay may be had if mackerel rise in sufficient quantities to warrant the setting of the seine. It requires but a word from the master, if they do rise, when away go the men into the boat, followed by the skipper a spare hand or the cook taking the place at the bait-box, and continuing to throw the 'food for the fishes.' The boat is in the meanwhile dropped around on the starboard quarter, and when about 20 fathoms off overboard goes the end of the seine, with buoy attached, which is picked up and held by two men in the seine-dory, and the boat is pulled to leeward, at right angles with the vessel, as fast as the seine can be got out, as much depends on getting to leeward as far as possible, as the vessel is constantly changing her position, driven by wind and wave. When the middle of the seine is reached (usually marked by a double canvas covered cork), the boat is turned short around and all possible speed made up to and across the vessel's bow, and, with another sharp turn, straight to the dory. As soon as the operation of 'pursing,' or drawing the bottom of the seine together, is commenced, the man in charge of the vessel quickly scatters several buckets of bait into the water, in order to keep the unsuspecting victims of man's wants busy; then springs to the fore sheet and hauls it in; up goes the jib; the wheel, which has been hard down, is righted; the vessel pays off, and, gathering headway, is soon speeding over the cork-ropes out of the center of the seine, the ropes and seine sinking and going beneath the vessel at right angles to the keel, leaving the mackerel behind. If the operation of getting headway on the vessel is not skillfully done, and she be allowed to drift broadside to the ropes, there is danger of catching the seine, and then good-by to the fish, for that time at least, with a prospect of mending to be done to repair damages. When once outside of the seine the man in charge of the vessel has only to keep clear of the boat and sail at his own sweet will and pleasure until the fish are 'dried up' (all the slack twine being in the boat and the fish in close quarters in the bunt), which fact is learned by observing an oar upheld by some one on board of the boat. Perhaps at the last moment, before the complete closing of the seine, the fish have escaped; with sore hands and tired body, we, remembering

the old adage, prepare to 'try, try, again,' or mayhaps, as I have seen the case, from one barrel to over two hundred of the shining beauties are secured, and are soon tumbling over the rail from the big dip net, and the hearts of the fisher lads are made glad, even though the prospect of an all night and day job at dressing and salting be in prospect."

THE MACKEREL POCKET OR SPILLER.—In 1877 the schooner Alice, of Swan's Island, had a bag-net made of haddock ganging-line, into which the fish were transferred when there were too many to be cared for at once. This vessel began the season in the Gulf of Saint Lawrence, but caught only 200 barrels of mackerel there, and later fished on the coast of Maine, where, up to October, she had caught 1,400 barrels.

A development of this idea is the mackerel pocket or spiller, patented in April, 1880, by H. E. Willard, of Portland, Me., an article long needed in the mackerel seine fishery, and which has received from the fishermen the name of "mackerel pocket" or "spiller." It was first used by the patentee in 1878; and Capt. George Merchant, jr., of Gloucester, Mass., invented and put into practical operation an improved spiller in 1880, though it was not until the succeeding summer that the advantages of its use was known to the majority of the mackerel fishermen, who have hastened to adopt it, and now all of the mackerel vessels sailing from this port are provided with one of the pockets.

The apparatus is a large net-bag, 36 feet long, 15 feet wide, and 30 feet deep. It is made of stout, coarse twine, and is attached to the side of the vessel, where it is kept in position, when in use, by wooden poles or "outriggers," which extend out a distance of 15 feet from the schooner's rail.

When distended in this manner, a spiller will hold over 200 barrels of mackerel, which can thus be kept alive, as in the well of a smack, until the crew, who have captured them in the great purse-seines, have time to cure their catch. As is well known, it frequently happens that several hundred barrels of mackerel are taken at a single haul. Heretofore, when such a large quantity of fish were caught, but a comparatively small portion of them could be cured by the crew of the vessel to which the seine belonged. The result was, that when a large catch was made a considerable percentage of the fish were generally "given away" to some other vessel, since if only a part of them were removed from the seine to the vessel's deck, the remainder being left in the net until the first lot were cured, the chances were nine to one that the fine twine of which the purse-seines are made would be bitten in many places by the swarming dogfish (*Squalus americanus*), that *bete noir* of the mackerel fisher. In addition to the injury to the net, the inclosed body of fish were thus allowed to escape, and went streaming out through the numerous holes made by the keen teeth of these voracious bloodhounds of the sea, which, in their fierce and ravenous pursuit of the imprisoned mackerel, usually succeeded in robbing the fisherman of a large portion of the fruits of his labors.*

The "spiller" is made only of coarse twine, and though not entirely exempt from the ravages of the dogfish and sharks, is rarely injured by them; and now when a large school of mackerel are caught in a seine the fish are turned into the bag, from which they are "bailed out" on to the schooner's deck only as fast as they can be dressed, and in this way it frequently happens that a full fare may be secured in a single set of the net.

* Capt. S. J. Martin writes, that in the summer of 1881 the crew of one of the mackerel schooners endeavored to save their seine from the depredations of the dogfish by hauling the staysail underneath it, thinking that if they could thus prevent the dogfish from seeing the mackerel inclosed in the net the latter would not be harmed. But this did not succeed fully, since the sail was badly bitten and much injured by the dogfish, making this experiment a rather costly one.

The introduction of this simple net-bag undoubtedly saves to our fishing fleet many thousands of barrels of mackerel each season.

The "spiller" invented by Mr. Willard is simply a sheet of netting 540 meshes square, bound around with rope; it is made of five sheets of twine, each 108 meshes deep and 540 meshes long. These sheets are laced together. This net, when in use, is suspended from its four corners to the side of the vessel and the outriggers, mentioned above, and hangs something like a hammock. From its shallowness, however, it was not so well adapted to the purpose for which it was designed as was the deeper bag-shaped net subsequently devised by Captain Merchant, and which has been described above.*

The mackerel pocket is hung to 1¼-inch rope, and on the portion of this which comes next to the vessel are strung egg-shaped wooden floats. These are only for the purpose of securing the edge of the net-bag firmly to the rail of the vessel. The border of the pocket being drawn over the rail, a board is laid on top of it and held in position by wooden pins passing through both board and rail, the net being thus fastened between the two.

To the outer edge of the mackerel pocket, either Williard's or Merchant's, is attached a rope bridle, the ends of which are fastened at a distance of about 9 feet from each outrigger; a thimble is seized into the upper part of this bridle, and when the mackerel have been turned into the pocket the fore and after staysail halyards are bent into this thimble, and the outer edge of the pocket is supported thereby so as to take as much strain as possible off the outriggers, which are only 4 inches in diameter. The outer and upper corners of the "spiller" are supported by ropes which run through single blocks attached to the farther ends of the outriggers. By means of these ropes the outside edge of the pocket may be raised or lowered. When a school of mackerel has been caught in the seine the pocket is slacked down to the surface of the water, and its outer edge having been fastened to the cork rope of the seine, the fishermen gather in on the twine of the latter, and, by dextrous management, turn the whole body of fish into the bag provided for their reception, and where they can be kept alive, as previously mentioned, until such time as they can be properly cared for. The mackerel having been transferred to the pocket, its outer edge is usually raised slightly above the water. When the vessel is rolling and there are many fish in the pocket there is often considerable strain brought to bear on the outriggers, which, however, being supported by guys or tackles to the standing rigging, rarely break. It may be assumed, perhaps, that the enormous catches of some of the mackerel schooners in the summer of 1881 and succeeding years are due very largely to the use of this implement. Never within the previous history of the fishing business of New England have so many fish been caught or so much money made by a single vessel in the mackerel season as was the case in the season of 1881. The schooner Alice, of Swan's Island, Maine, is reported by the secretary of the Boston Fish Bureau to have taken 4,900 barrels of mackerel, the value of which exceeded $28,000. The schooner Edward E. Webster, of Gloucester, caught 4,500 barrels of mackerel, stocking more than $26,000. A long list of other large catches might be added in proof of the efficacy of the mackerel pocket, but for obvious reasons they are omitted here.

5. THE CARE OF THE FISH.

The manner of caring for the fish is very similar to that upon the mackerel schooners fishing in the old way with jigs (described below), excepting that a larger quantity is likely to be taken at once, necessitating much more haste in salting or dressing them. When haste is necessary, the process of "plowing" is usually deferred until after the fish have been salted.

* The "mackerel pockets" constructed by Capt. George Merchant are 36 feet long, 30 feet deep, from 15 to 18 feet wide across the mouth; 2-inch mesh, and knit of 12-21 half-patent twine.

The common method of dressing on a seining schooner is as follows: The men engaged in dressing are divided into gangs generally of three men each. Each gang has two wooden trays about 3 feet square and 6 or 8 inches deep; these are placed on the tops of barrels; one is called a 'gib-tub,' the other a 'splitting-tub.'*

Except on the seiners, the mackerel, when caught, are put into the barrels, and the splitting is done upon a board laid across the top of the barrel, rather than in a splitting-tub. One man of each gang splits, the other two gib, or eviscerate, the fish. The tub of the man who splits, of course, contains the fish to be split. With a scoop-net the splitter, or one of the "gibbers," from time to time, fills the splitting-tub from the pile of mackerel lying upon the deck. On the side of the splitting-tray next to the "gibbers" is a board about 6 to 10 inches wide, called a "splitting-board," on which the splitter places the fish as he cuts them open. He takes them in his left hand (on which he has a mitten) round the center of the body, head from him, and with the splitting-knife splits them down the center of the back. As fast as he splits the fish he tosses them into the tray of the "gibbers." The "gibbers" protect their hands with gloves or mittens. As fast as the "gibbers" remove the viscera, with a peculiar double motion of the thumb and fingers of the right hand, they throw the fish into barrels, which are partially filled with water; these are called "wash-barrels." If the men have time they "plow" the fish before salting them, making a gash in the sides of the fish nearly to the skin with the peculiar knife, "the plow," provided for the purpose.

Before the fish are salted the dirty water is poured out and clean water is added. About one barrel of salt is used for every four barrels of mackerel. This is the first salting. When the fish have been salted they are placed in unheaded barrels until the weather is unfit for fishing, or the deck is filled with them, when they are carefully headed up and stowed away below.

The speed with which a large deck-load of mackerel can be disposed of by the crew is something marvelous. A good splitter will handle from forty-five to sixty mackerel a minute. In one well-authenticated case a man split sixty-seven mackerel a minute for three consecutive minutes.† A good "gibber" can handle a barrel of large mackerel in from five to seven minutes. A smart crew of fourteen men can dispose of a deck-load of large mackerel in from fifteen to eighteen hours, salting them away properly in the barrels. The smaller the mackerel the longer it takes to dress a barrel of them, the time required to handle a small or a large mackerel being precisely the same.

When the fish are to be iced and carried fresh to market they can be disposed of much more rapidly, it being simply necessary to stow them away in the hold without splitting. They are usually washed before being placed in ice, and occasionally gibbed without splitting, the viscera being drawn through the gill openings.‡ The most rapid way of caring for the fish is to place them in barrels of ice-water. This is done for the most part in the spring or fall.

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* Also called, especially in Gloucester, "gib-keelers" and "splitting-keelers."

† An expert can split mackerel nearly as fast in the darkest night as at any other time. The sense of touch becomes so acute from long practice that the fisherman can tell (without seeing it) when he grasps a mackerel whether its head is in the right direction or not, and also which side should be laid to the board in order to bring the fish's back in proper position for the knife. The splitter holds the knife with his fingers, letting the thumb slide down along the upper side of the fish, thus guiding unerringly the keen and swiftly moving blade. Whether the fish be large or small it is almost invariably split with the utmost precision, the edge of the knife glancing along on the left side of the vertebra, and scarcely a hair's breadth from it, while the point goes *just* deep enough and no farther. But one must witness the operation of splitting mackerel in order to fully appreciate the skillfulness of the performance.

‡ Fresh mackerel are never gibbed for the New York market in spring, but a law of Massachusetts compels the fishermen to eviscerate all mackerel taken to Boston. In the first named port the cargoes of fresh fish are sold by commission merchants, while in Boston the captain sells directly to the dealers.

6. RUNNING FOR THE MARKET.

Those mackerel schooners engaged in market fishing find it desirable to make their passages with the utmost speed, but rapid passages in summer are, of course, much less dangerous than those made in winter by the haddock and halibut vessels. Great expedition is used by all mackerel vessels, since the season is short, and they feel obliged to take advantage of every opportunity. In the case of salted fish, however, there is no such anxiety to sell, and the chief desire of the skipper is to land his fish and to return to the fishing ground with no unnecessary loss of time.

It often happens that mackerel catchers who are not engaged in the fresh-fish trade take a big haul, 200 barrels or so, when they have but few barrels to put them in and scarcely any salt. In such cases it is of the highest importance to reach home if possible, or at least some large fishing port where barrels and salt can be obtained, and all the sail that can be spread or that the vessel will carry is set.

7. LANDING THE CARGOES.

The mackerel are hoisted out on the wharf by a horse, the duty of the crew being to hook on the barrels and to roll them to the proper places on the wharf, after they are landed, where the barrels are generally stowed on their heads, ready to be opened. In seasons of abundance, and when the men have become exceedingly fatigued from their labors in catching and dressing a fare of mackerel, it is often the case that the skipper will hire a number of longshoremen to take the fish out of the vessel. At such times, too, the shoresmen are employed to plow the fish, and also to assist in packing them, since the fishermen find it more profitable to hire men to do this than to remain ashore and do it themselves. For in the mean time they may be fortunate enough to catch a fare of two or three hundred barrels of mackerel.

In the days of hook-and-line fishing, the landing and packing of mackerel was carried on much more leisurely than at present. At first it was customary for the men composing a crew to hoist the mackerel out on the wharf by tackles; but within the last fifteen or twenty years it has been found more profitable to employ a horse for this purpose, since the work of discharging can be carried on much more rapidly than before and with less tax upon the strength of the men. The several processes of unheading the barrels, culling, weighing, and packing the mackerel are fully described in another chapter, and need not be repeated here.

8. FINANCIAL PROFITS OF SEINING.

The following tables, copied from the annual reports of the Boston Fish Bureau, show the large catches and "stocks" by the mackerel fleet in New England waters for the seasons of 1880 and 1881:

Vessels.	Barrels cured.	Amount of stock.
1880.		
Schooner Alice Capt. H. B. Joyce, Swan's Island, Me	3,700	$19,548 75
Schooner Edward E. Webster, Capt. S. Jacobs, Gloucester, Mass	3,969	19,465 00
Schooner Alice C. Fox, Captain Rowe, Portland, Me	.....	12,432 00
Schooner Louis and Rosa	2,700	12,492 00
Schooner Frank Butler	2,036	11,600 00
Schooner Mary Greenwood	1,700	11,035 00
Schooner Kate Florence	2,500	11,060 00
Schooner Addie F. Cole	1,900	10,500 00
Schooner Cora Lee	1,875	10,250 00
Schooner Cora Smith	2,150	10,000 00
Schooner M. O. Curtis	2,000	10,000 00
Schooner Mary Snow	1,352	9,281 00
Schooner F. F. Nickerson	2,350	9,730 00
Schooner Dictator	1,652	9,213 00
Schooner Morning Star	1,527	8,987 00

Financial profits of seining—Continued.

Vessels.	Barrels cured.	Amount of stock.
1881.		
Schooner Alice, Swan's Island, Me	4,965*	$28,055 23
Schooner Edward E. Webster, Gloucester, Mass	4,500†	26,570 00
Schooner Isaac Rich, Swan's Island, Me	3,276	15,500 00
Schooner Frank Butler, Boston, Mass	2,680	15,000 00
Schooner Mertie and Delmar, South Chatham, Mass	3,905	14,138 00
Schooner A. E. Herrick, Swan's Island, Me.‡	2,280	13,674 00
Schooner Robert Pettis, Wellfleet, Mass	2,580	12,410 18
Schooner Roger Williams, North Haven, Me	2,450	12,000 00
Schooner R. J. Evans, Harwichport, Mass	3,600	12,000 00
Schooner Louis and Rosa, Boothbay, Me	3,028	11,557 46

* 3,665 barrels pickled and 1,240 barrels fresh.
† 1,600 barrels pickled and 2,900 barrels fresh.
‡ The Herrick did not sail until July 22.

When it is taken into consideration that these vessels are employed in fishing barely eight months at the longest, and some of them only four to six months, it will be seen that the business is an exceedingly profitable one for many of the fleet, while the greater portion make fair returns.*

9. HISTORY OF THE USE OF PURSE-SEINES.

The earliest record of the use of the purse-seine is the following, obtained from Capt. E. T. Deblois, of Portsmouth, R. I.:

"The first purse-seine that was made, so far as I know, was made by John Tallman the first, and Jonathan Brownell and Christopher Barker, in the year 1826. It was 284 meshes deep and 65 fathoms long. The purse-weight was a 56-pound weight, and the blocks were the common single blocks, and they had to reeve the end of the purse-line through the blocks before they put the purse-weight overboard. The first time the seine was set there were fourteen men to help; they set around what they called a 500-barrel school of menhaden, and while they were pursing, the fish rushed against the twine so hard that they twisted and snarled the net around the purse-line and weight to that extent that the men could not gather the seine up or get her into the boat again as they were, and after they had worked six hours, and quarreled over the matter, they decided to tow or warp the seine ashore at high water, and when the tide left the seine they would be able to unsnarl it, which they did the next day. It was a number of days before they could muster courage to set her again, and when they did they set around a small school with better success."

There is a general impression among the fishermen of Northern New England that the purse-seine was a development of the "spring-seine," elsewhere referred to, but this would seem to be a mistake, since the spring-seine, which really appears to have been nothing but a large sheet-net

*Among the "fishing items" in the Cape Ann Advertiser of October 21, 1881, we find the following mention of catches of mackerel made by some of the seiners, which may serve to show the energy and activity with which this fishery is prosecuted: "Schooner Moro Castle sailed from this port on Thursday morning of last week, and returned in the evening of the same day with 140 wash-barrels of handsome mackerel. Schooner Dreadnaught sailed from Portland after mackerel the other night, was gone twenty-one hours, and returned with 205 barrels. Schooner David A. Osier sailed from Hull Friday evening, and was at this port next morning with 105 wash-barrels of mackerel. Schooner Wildfire, Captain McLain, has landed and sold $3,200 worth of mackerel in the past fortnight, and has enough fish on board to add another $1,000 to her stock. Schooner Fleetwing took 210 barrels sea-packed mackerel at one haul of the seine off Plymouth on Saturday. Schooner Wm. M. Gaffney took 140 wash-barrels at one haul Sunday, and schooner Henry Friend 140 wash-barrels at one haul Sunday night. Schooner Madawaska Maid left Gloucester Sunday, turning Eastern Point at 11 o'clock a. m., and arrived at Boston at 5 o'clock Monday morning, with 225 barrels sea-packed mackerel. In five weeks the Madawaska Maid has landed 1,000 barrels of mackerel. The schooner Wm. M. Gaffney landed 900 barrels of mackerel in twenty-one days."

with special appliances adapting it for use on board of a vessel, was not used in New England until 1853 or 1854. There is also another tradition to the effect that the purse-seine was invented about the year 1837 by a native of Maine who had for some years been employed as a hand on a Gloucester schooner, and who conceived the idea of capturing mackerel in large numbers, and invented a seine substantially like the one now in use, which, finding the Gloucester fishermen unwilling to enter into experiments, he carried to Rhode Island, where it was used in the vicinity of Seaconnet for seining menhaden. This would appear to be a conglomeration of errors, partly imaginary, partly based upon the circumstances already narrated by Captain Deblois.

Reference has already been made to the claim that the purse-seine was invented in Rhode Island as early as 1814. Another early allusion to this new instrument of capture is given in the following paragraph, quoted from the Gloucester Telegraph of Wednesday, July 21, 1839:

"*New Fishing Tackle.*—We noticed, a week or two since, the fact that Capt. Isaiah Baker, of Harwich, had recently commenced fishing with a seine of entirely new construction and with remarkable success. It was stated in the Yarmouth Register that he had cleared about $3,000 in one week by taking shad. A correspondent writes us from West Harwich that the fortunate captain still continues to make equally 'glorious hauls.' He is now in Provincetown with his seine catching mackerel, and recently took 60 barrels at one 'shoot.' This new mode of fishing bids fair to create an entire revolution in the mackerel and shad fisheries. Our correspondent says that the Vineyard Sound will soon become a great fishing ground. It is well known that all the shad, bass, mackerel, &c., which are found in Block Island Channel early in the spring pass through the sound, and it is now ascertained that with proper seines they may be caught in great abundance. With a purse-seine, when mackerel are schooling or shoaling, the fishermen may run around them and inclose 100 barrels. They will not bite at bobs, as in years past, but Cape Cod ingenuity has devised something to outgeneral them."

The purse-seine was undoubtedly a development and extension of the idea of the drag-seine supplemented by that of the gill-net used at sea in sweeping around schools of fish.

The first seine used north of Cape Cod was that carried by Capt. Nathaniel Adams, of Gloucester, in the schooner Splendid, in the year 1850. Capt. Nathaniel Watson, of the Raphael, began using one the same year. According to Mr. Luther Maddox, the earliest experiments were at Chelsea Beach. It is claimed by some that Gorham Babson, of Gloucester, had one in use as early as 1847.

The early seines were about 200 yards in length, 22 fathoms in depth, and of 2½-inch mesh, the bunts being about 250 meshes square. The twine was much heavier than that used in the present seine; the whole net weighed 600 or 700 pounds. The seine in its present form did not come into general use until about 1860.

The rapidity with which this expensive form of apparatus has come to be generally employed in our fisheries seems almost marvelous. At the present time the total number of these nets used in the mackerel fishery is not far from four hundred, valued at $160,000; in the menhaden fishery, three hundred and sixty-six, valued at $138,400. The total value of the purse-seines with the value added of the seine-boats, which really are parts of the same apparatus, cannot be less than $440,000.

Capt. W. H. Oakes states that in early days a certain kind of net was used in catching menhaden which reached to the bottom in shallow water and which was pursed by means of ropes. Capt. George Blatchford used to go for menhaden in an old pinkey, and used one of these nets.

Captain Oakes is of the opinion that Capt. William Ratcliff, of Rocky Neck, Gloucester, was the first man who caught mackerel in deep water off-shore. He used some kind of a purse-seine,

and with it in two hauls caught about 90 barrels of mackerel off Monhegan in 90 fathoms of water. Capt. George Merchant, jr., of Gloucester, writes as follows regarding the early attempts to seine mackerel in deep water. He says: "Previous to 1862 the only mackerel caught in deep water in seines were taken with the schools of pogies. From one to ten or twelve hundred in number were often caught in this way, the seiners supposing that their being with the pogies prevented them *from trying to escape, since pogies seldom* leave the seine after it is around them; but we never set the seine for mackerel when in deeper water than 10 fathoms, our seines not being deeper than that at that time. One day in July, 1862, I lay at anchor near Boone Island, it being calm at the time. While lying there a school of mackerel came up and began to play around at the surface not far from us. Knowing that the water was 25 fathoms deep where the fish were, I did not go after them right away, but after they had been schooling some time I concluded to go out and look at them. I found the water to be as I had expected—25 fathoms deep. I thought, however, that I would try just to see what would come of it, although the men said it would be no use, as the fish would soon disappear; but we threw out our seine and went around them with as little noise as possible, and commenced to purse up, the men saying that the mackerel would soon go; but they did not go, but continued to school in the seine until the latter was pursed up and the rings on the boat. Then we thought we had done something never before heard of. We took 50 barrels of large mackerel that time.

"After securing the fish I weighed anchor and ran to Richmond's Island. When I arrived there I found fifteen fishing vessels at anchor. I told the skippers and crews that I had taken 50 barrels of mackerel in deep water, but they would not believe it, saying that if I had it would never be done again. But it set them to thinking, and they soon found that mackerel could be caught in deep water. The fleet of seiners began to increase from that time, and has kept growing until the present, when it amounts to about two hundred sail.* I date the catching of mackerel in deep water from the time and occurrence I have mentioned above. I was in one of the first seven vessels that sailed on seining voyages from Gloucester, Capt. Samuel Blatchford and Capt. Nathaniel Watson being the two first to try the business, and they both gave up seining, as it did not pay them."

Wellfleet, Mass., had fifty-two mackerel seiners in 1877. Seines were first carried by the Wellfleet vessels about 1857, but their use was soon abandoned. In 1863 to 1865 the Mary B. Dyer had a seine, and since that time more or less seines have been in use. In 1873 all the vessels went into this business.

The first purse-seine brought into Central Maine, writes Mr. Earll, was bought by Mr. Amherst Spofford and taken to Damariscove in 1859, and used with rather indifferent success until 1861; it was 130 fathoms long and 12 fathoms deep; the parties kept it on the island and took it out in small boats whenever fish were seen schooling in the vicinity. It seems that Mr. Spofford did not thoroughly understand setting it and caught but few fish.

In 1861 he sold it to Messrs. William Gray and Miles Pierce, and it was taken to Cape Newagen, where it was successfully used by carrying it out in a small boat and landing the fish on a dressing stage on shore in the same way. The next year it was put aboard a small schooner, the Leon, and the fish landed as before in small boats to be dressed, the vessel being only large enough to carry the seine.

In 1863 the seine was put aboard the schooner Dawning Day, 73 tons (old measurement), and the fish were dressed aboard. This was really the commencement of deep-water seining in this section, and the vessel did so well as to induce others to go into the business the following year.

* Sailing from Gloucester.

The schooner Niagara was the first to provide herself with a seine in 1864, and another was bought and owned by two small vessels, the Wild Rose and the Neptune, one carrying the seine and the other salt and barrels for curing the fish. This plan did not work well and was soon abandoned. The schooner Niagara did well from the start, and has always been high line of the seiners for this region.

Georgetown sent one seiner, the Coquimbo, in 1865, and a little later the schooner Sunbeam, Captain McMann, but they met with poor success, and no seiners have been sent since from that port.

Westport has made two attempts at introducing seining, the first in 1872, by schooner Jennie Armstrong, Capt. B. F. Jewett, and the second a three-masted schooner of 350 tons, the George W. Jewett, Capt. A. M. Jewett, carrying two seines and crews, in 1875. Both vessels did very poorly and gave up the business after the first season.

10. THE ATTEMPTED USE OF THE PURSE-SEINE IN NORWEGIAN WATERS.

In 1878 a Gloucester vessel essayed fishing for mackerel with a purse-seine on the coast of Norway. In April the schooner Notice, Capt. Knud Markuson, departed on this mission, taking a crew of twelve men and the most approved seining apparatus. It was remarked by a writer in the Deutsche Fischerei-Zeitung of July:

"The mackerel fishermen, who have till now been in the habit of plying their trade in open but suitable boats, are, however, greatly agitated at the present moment in consequence of the arrival at Risor, some three weeks ago, of an American fishing smack, direct from Gloucester, in North America, understood to be followed by a whole fishing fleet from New England, to take part in the mackerel fishery outside the Norwegian fishing territorium. As all these American smacks are reported as provided with bag or purse nets, by means of which they are enabled to catch more fish upon one single haul than ten Norwegian boats during a whole day, it is obvious that the Norwegian fishermen will have to discard their old mode of fishing, and to have recourse to the American fishing method, if they do not want to lose all the advantages enjoyed till now. The mackerel fishery has always been of great importance to Norway, some 7,000,000 of these fish being on the average caught annually, of which number about 70,000 centners, at a value of from 600,000 to 700,000 crowns, are exported. The Government is well aware of the danger threatening the public weal, and has consequently taken every possible measure in order to prevent such disastrous results as the loss by the Norwegian fishermen of the mackerel fishery. A most accurate description of the nets used by the Americans has been printed, and, with a great number of nets of this kind, made to order by the net manufactory at Bergen, distributed among the fishing population. Models of the different sorts of the fast-sailing American boats have also been obtained through the Norwegian consul at Gloucester, Mass., direct from the manufacturers of such boats. The well-known industry and activity of the Norwegian fishermen, combined with the efforts of the Government, will, no doubt, enable them not only successfully to hold but to improve their own prospects as regards the mackerel fishery by the timely adoption of the American methods and arrangements of fishing."*

The venture was, however, not a successful one. On his return home Captain Markuson stated that he had been unable to use the seine advantageously, owing to the fact that the mackerel did not in those waters school together in large bodies, as they do along the New England shores.

* Cape Ann Advertiser, August 9, 1878.

2.—THE SPRING SOUTHERN MACKEREL FISHERY.

The spring mackerel fishery is in reality a branch of the mackerel-seine fishery, and the methods employed in it are identical with those described in the previous section of this chapter. In this place it is necessary only to add a history of this fishery, a description of the grounds frequented by the southern fleet, and a few statistical notes.

1. FISHING GROUNDS.

The fishing grounds frequented by the southern mackerel fleet lie between Cape Hatteras and the South Shoals of Nantucket. The fishing season is in the months of April and May. The first vessels go south about the middle of March or soon after; but until 1878 no mackerel were ever taken before the 1st of April.*

2. EARLY CATCHES OF MACKEREL, 1878 TO 1881.

The earliest results of the southern fishery in the years 1878 to 1881 were as follows:

FIRST CATCHES IN 1878.

March 30.—Schooner Lilian, of Noank, Conn., Captain Latham, off Chincoteague.

April 16.—Schooner Sarah M. Jacobs, of Gloucester, Capt. Solomon Jacobs, caught her first mackerel in latitude 36° 10′ N., longitude 74° 45′ W.

April 18.—Schooner Alice, of Swan's Island, Me., Capt. Hanson B. Joyce, master, caught her first mackerel 25 miles southeast from Cape May.

April 25.—Schooner John Somes, of Swan's Island, Me., Capt. J. S. Staples, master, caught her first mackerel 50 miles southeast from Cape May.

FIRST CATCHES IN 1879.

April 12.—Schooner Sarah M. Jacobs, of Gloucester, caught first mackerel in latitude 36° 35′ N., longitude 74° 50′ W.

April 13.—Schooner Augusta E. Herrick, of Swan's Island, Me., Capt. William Herrick, caught first mackerel (130 barrels) in latitude 37° 37′ N., longitude 74° 23′ W.

April 13.—A few fish taken by schooner S. G. Wonson, of Gloucester, 75 miles south-southeast from Cape Henlopen.

April 14.—Schooner Charles Haskell, of Gloucester, caught first mackerel in latitude 38° 08′ N., longitude 73° 57′ W.

April 19.—Schooner Alice, of Swan's Island, Me., caught first mackerel (140 barrels) in latitude 37° 50′ N., longitude 74° 03′ W.

FIRST CATCHES IN 1880.

April 1.—Schooner Edward E. Webster, of Gloucester, Capt. Solomon Jacobs, caught the first mackerel of the season in latitude 35° 30′ N., longitude 74° 15′ W.

FIRST CATCHES IN 1881.

March 20.—Schooner Edward E. Webster, of Gloucester, caught the first fish of the season, and the earliest on record, in latitude 37° 10′ N., longitude 74° 05′ W. A second trip was caught by the same vessel on April 18 in latitude 38° 38′ N., longitude 74° 00′ W.

May 16.—The schooner Alice, of Swan's Island, caught 30,000 mackerel off Block Island.

3. THE VESSELS, APPARATUS, AND METHODS OF FISHING.

The southern mackerel fishery is participated in by thirty or forty of the Gloucester mackerel schooners and a number of vessels from Cape Cod and Maine. The total number of vessels

*Schooners Edward E. Webster, Nellie N. Rowe, and Ivanhoe sailed for the south on Saturday (March 11) in pursuit of mackerel, the Webster getting the start by sailing at 4 o'clock a. m., and the others following at 4 o'clock p. m. This is the earliest start ever made in the mackerel fishery. Last year the Edward E. Webster sailed March 15, which was unusually early, and obtained a fare within a week thereafter. (Cape Ann Advertiser, March 17, 1882.)

engaged in this fishery in 1879–'80 was sixty-four, of which twenty-three were from Maine ports and the remainder from Massachusetts. These are among the swiftest and best of the fleet, and are provided with the fullest amount of canvas for making a quick passage to and from the fishing grounds. Nearly all of them have ice-houses arranged in the manner already described.

The apparatus is in every respect identical with that used in the summer fishery; the vessels, however, carry, as has been stated, a much smaller number of barrels than when engaged exclusively in salting the fish. The manner of fishing is the same as that already described, except that the fish being much scarcer and their movements less regular than in summer on the more northern fishing grounds, a greater amount of vigilance and perseverance is required on the part of the fishermen. This is the season of the migration of the mackerel, and it is necessary that the fishermen should understand how to follow the schools of fish as they make their way northward, even if they are out of sight for days at a time. They cruise sometimes for weeks off the capes of the Delaware and Chesapeake, sometimes venturing farther south to the latitude of Cape Lookout, though they rarely find mackerel south of the mouth of the Chesapeake. Sometimes weeks elapse before they find the fish. After the schools have made their appearance they follow them, and when they are not visible, usually allow 5 to 15 miles a day for their northern progress, trying to keep among them as they make their way northward. When among the fish it is a common practice of the vessels to heave to and "jog" all night long in a northerly direction, to keep pace with the movements of the fish.

As soon as the first fare of fish is obtained, even if only a small one, the vessels make their way to New York with all possible speed, for the earliest fish command much higher prices than those brought in later in the season. After mackerel become more plenty the vessels seldom go to market with less than 75 or 100 barrels, and it is not unusual for 250 to 300 barrels, the results of one day's catch, to be taken in. The successful vessels often run into New York two or three times a week, especially when the fish are most abundant off Sandy Hook.* This method of fishing and marketing the fish is kept up until the schools have reached the shoals of Nantucket and the spawning season in that locality begins. At the close of the spawning season, when the fish again rise to the surface, or when the other schools are found on George's Bank and in the Gulf of Maine, the vessels resort to the ordinary method of salting their fish, only a few continuing the practice through the summer of carrying their fish fresh into the markets of New York and Boston. Occasionally, cargoes of fresh mackerel are taken in the spring and summer into Philadelphia, and also, later in the season, to Portland.

The spring mackerel fishery, as just described, is of comparatively recent origin, not dating back much before 1870. Twenty to thirty years ago New York was supplied with fresh mackerel chiefly by Connecticut smacks, which caught the fish with hook and line and carried them to New York alive in wells. A peculiarity of this smack fishery was that the men fished with lines fastened to poles, as anglers fish for trout. The object of having poles was to enable the fishermen to drop the captured fish alive, and without injury, into the smack's well.

Vessels belonging north of Cape Cod at that time rarely if ever sold their fish fresh, although they often went as far south as the capes of Delaware. Their fares were salted and carried to Boston or other ports in the ordinary manner.

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* Dispatches received here yesterday announce the arrival of schooner J. J. Clark at New York on Monday with 150 barrels fresh mackerel, which sold at from 6 to 18 cents apiece according to size, and later of the arrival at the same port of the schooners Seth Stockbridge, A. M. Terry, Smuggler, and T. M. Cromwell, each with 200 barrels; Moses Adams, 300; Maud and Effie, 250; Golden Hind, 75; Fleetwing, 65; H. A. Duncan, 20; and James A. Stetson, 50 barrels, which were sold at from 8 to 12 cents apiece. (Cape Ann Bulletin, April 17, 1878.)

The southern mackerel fishery was undoubtedly first prosecuted by vessels from Cape Ann at least we have been unable to obtain reliable accounts of any fishermen from other ports engaging in this fishery at an earlier date.

"Capt. John Parsons, of Rockport," writes Mr. A. Howard Clark, "says that he was one of the first to go south after mackerel from that port. He went in 1817 in the schooner Defiance, of 35 tons. They went as far south as Cape May, and caught 60 barrels of mackerel, all of which were taken by drailing. They had outriggers for towing their lines, and the lead sinkers weighed from 4 to 6 pounds."

An item in the Cape Ann Advertiser of May 20, 1859, says:

"The practice of going south for mackerel has almost died out of late years, and this year there are but three or four vessels in the business. Some of the vessels which go in quest of bait take mackereling apparatus with them."

"The practice of going south for mackerel in spring," writes Mr. Earll, "was first begun in Maine by a Georgetown vessel, the Queen of the West, Capt. Francis Low, in May, 1851. She was gone but a short time (four to six weeks), and returned with a full fare, after which she proceeded to the bay. The next year the schooner Arcola, Capt. Warren Low, of Georgetown, joined the Queen of the West on her southern spring trip, and in 1853 three went. Booth Bay sent none south until 1867, when the Cynosure went, and Southport sent her first vessel south in 1868. In 1879 five or six went from this section."

3.—THE MACKEREL HOOK-FISHERY.

The mackerel fishery at the time of its highest development, from 1820 to 1870, was carried on almost exclusively by the use of small hooks with heavily weighted shanks, known as "mackerel jigs." For many years there were from six hundred to nine hundred vessels, chiefly from Cape Cod and northward, engaged in this fishery, and in the year 1831 the total amount of mackerel salted in Maine, New Hampshire, and Massachusetts was 450,000 barrels.

As will be seen by an examination of the diagram showing the yield of the mackerel fishery from 1804 to 1881, elsewhere published in this report, the quantity of fish taken from year to year has been extremely variable, but has at no other time approached the enormous quantity on record for the years 1831 and 1881.

The jig has now been almost entirely superseded by the purse-seine, and this radical change in the method of catching mackerel has caused the desertion by the mackerel fleet of the Gulf of Saint Lawrence, and the practical futility—to benefit our fishermen—of the fishery clauses of the Treaty of Washington. All attempts, with a very few exceptions, to use the purse-seine in the Gulf of Saint Lawrence have been failures.

In 1880 the schooner Alice, of Swan's Island, caught 700 barrels by the use of a purse-seine in the gulf, but not 10 per cent. of the other vessels which visited this region, then or within the four or five previous years, paid their expenses.

The mackerel hook fishery is of the past, and this chapter must be regarded, in large part, as historical. It is by no means impossible, however, in years to come, that the old method of fishing, which had many undoubted advantages over that at present employed, will be revived.

1. FISHING GROUNDS.

The grounds frequented by the mackerel-hookers, as the fishermen call them, were as follows:

THE GULF OF SAINT LAWRENCE.*—In the early part of the season the favorite fishing grounds were in the southwestern part of the Gulf of Saint Lawrence, from Cape Gaspé to the North Cape of Prince Edward Island, especially off Point Escuminac, Pigeon Hill Ground, or the west shore lying along the coast from Miramichi to Point Miscou, Bank Bradley, Bank Orphan, and Bay of Chaleur. Later in the season, in July, August, and September, the principal fisheries were carried on upon the grounds just mentioned, also around the Magdalen Islands and along the north side of Prince Edward Island. Occasionally, too, in August and September, vessels fished on the south side of Prince Edward Island from Georgetown to East Point. In September and October fishing was carried on at the Magdalens, Prince Edward Island, in the Bay of Saint George, between Cape Saint George and Port Hood, and on the northwest shore of Cape Breton, from Port Hood to Cape North. Favorite localities were about Margaree Island and Cheticamp; also, on the east side of Cape Breton, in Aspee Bay, and about Sydney. About 1858 and 1859 several successful fares were made in the estuary of the Saint Lawrence, from Cape Gaspé to Cape Chatte, and about the Seven Islands and Mingan Islands on the coast of Labrador. In the year 1877 a Gloucester schooner obtained 200 barrels of mackerel at Port au Port, on the west coast of Newfoundland.† Bird Rock, situated east of the Magdalen Islands, has occasionally been a favorite ground, since the mackerel taken there were almost always very large.

GULF OF MAINE.—From June to November there was excellent fishing in various parts of the Gulf of Maine. Early in the season mackerel were taken all the way from Cashe's Ledge to the Bay of Fundy; from the middle of June to September the favorite localities were in the vicinity of Monhegan Island, Matinicus Rock, and Mount Desert Rock. From about 1830 to about 1845 some fishing was done in the Bay of Fundy, north of the island of Grand Manan. When the autumnal migration of the mackerel begins the vessels follow them as they proceed southward. Favorite fishing grounds are then off Portland; later, about Boone Island, off Cape Ann, and the waters of Massachusetts Bay, and along the outside of Cape Cod, the latest catches being generally obtained off Chatham and the eastern part of Nantucket Shoals. Fishing here continues sometimes until the latter part of November.‡

GEORGE'S BANK.—Mackerel were in some years very abundant on George's Bank, especially on the southern portion from June to September. Later in the season the weather was generally unfavorable for fishing in this region. The mackerel caught here were recognized, as now, to be of very fine quality.

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* Mr. Daniel Cameron, of Southport, Me., thinks the first American vessels went to the bay in 1832. This year four went, among others the schooner Galen, Captain Pate, of Freeport. These schooners averaged 60 to 70 tons, carried about 250 barrels, and filled up in four or five days. The first vessel going to the bay from this section of which we learn was the pinkey Olinda, Capt. Joseph Maddocks, of Southport, in 1837. Captain Atwood states that in 1834 the New England fleet in the Gulf of Saint Lawrence consisted of six vessels, three of them from Provincetown. The Cape Ann Advertiser of May 13, 1859, *refers to "the custom which has grown up within a few years of* going to the Gulf of Saint Lawrence for mackerel, where already the supply is lessening."

† A LUCKY STREAK.—The schooner William T. Smith, Capt. Henry O. Smith, the last of the baymen, arrived home on Monday, bringing a good fare of mackerel, of which about 200 barrels were caught off Newfoundland, as already mentioned in our columns. These fish are of good size and prime quality, and will command a ready sale. Captain Smith struck a streak of luck when he ventured into untried waters in pursuit of mackerel, and his voyage will prove a profitable one, which is an anomaly in this branch of the fishing industry the present season. (Cape Ann Advertiser, November 23, 1877.)

‡ In the fall of 1849 one of the authors had the opportunity of seeing a fleet of mackerel schooners fishing off Chatham. The number of vessels in the fleet was variously estimated from 500 to 700 sail—a beautiful and interesting sight.

SOUTH COAST OF NEW ENGLAND.—Of late years a small quantity of extraordinarily fine mackerel have been caught in the vicinity of Block Island in summer and fall. In previous years the mackerel fishery in this vicinity was chiefly carried on in the spring.

THE COAST OF THE MIDDLE STATES FROM MONTAUK POINT TO DELAWARE.—This fishery was chiefly carried on in May, and in many respects corresponded to the spring mackerel fishery described in another section of this chapter; this is now prosecuted with seines on the same grounds, and the fish are mostly taken to New York for sale, principally in a fresh condition, though formerly they were generally salted.

THE EASTERN COAST OF NOVA SCOTIA.—In this region, although great quantities of mackerel are sometimes taken in pounds, nets, and seines, in the early summer and fall, they are very rarely taken on the hook. About 1854 and 1855 several fares of extremely large mackerel were caught at Sable Island by Cape Cod vessels.

2. THE FISHERMEN.

The men engaged in the mackerel hook fishery, especially in the period of its culmination, were almost exclusively natives of New England. From 1850 to 1870 the provincial element in the fleet gradually increased. When this fishery was most prosperous not less than 10,000 men and boys were employed on board the vessels belonging to the American fleet. The vessels engaged in this fishery carried very large crews; in fact, larger than have ever been carried by other vessels. Not infrequently a schooner of 80 to 100 tons would carry twenty men, and, in some instances, twenty-four. Among the crew were generally three or four boys, sometimes five, from ten to seventeen years of age. These boys fished from the extreme ends of the vessel; they were frequently very successful, and by the training in this fishery fitted themselves to assume responsibilities in the fishing fleet at a much earlier age than otherwise would have been possible. At sixteen or seventeen years of age many of the boys ranked among the first of the crew to which they belonged, and it sometimes happened that the command of a schooner was given to the most enterprising before they were out of their teens.

3. THE VESSELS.

Prior to 1848 the mackerel fleet was made up exclusively of the old-fashioned square-stern schooners registering from 25 tons to 80 or 90 tons, old measurement, and of pinkies registering from 20 to 60 tons. Newburyport had a large fleet of pinkies, registering, old measurement, from 40 to 60 tons. Most of them carried a flying jib.

From 1848 to 1850 the necessity for swifter vessels was felt, and various experiments, which are described in the chapter on the schooner, were made. From this time on, all the vessels added to the fleet were of improved model, approximating, more or less closely, to the modern type of the fishing schooner. These vessels were in those days known as "sharp-shooters." As early as 1855 the character of the fleet had become very much modified, there being a large percentage of modern-built vessels, and the pinkies and square-stern schooners were retained only by conservatives and at the smaller ports, especially those on the coast of Maine. Many of these old vessels had by this time been withdrawn from the mackerel fishery and employed in other branches of the fisheries. As early as 1870 the old square-stern vessels and pinkies had entirely disappeared from the fleet, most of them long before that date.

The mackerel-hookers, when fitted out for fishing, had the decks clear. Upon the starboard side of the vessel were arranged line-cleats. These were in early times small narrow cleats of pine nailed to the inside of the waist, but after the introduction of finer vessels the fishermen became

more careful, and substituted a complicated, ladder-like arrangement, consisting of two long horizontal strips, which were crossed by from eight to twelve shorter vertical strips or cleats, with projecting ends, an arrangement of this kind being secured between each pair of the top timbers. On the top of the rail was nailed the bait-board, in which were cut grooves arranged for the reception of a supply of jig bait, which was cut into bits ready for use; these grooves cannot be easily described. Upon the bait-board, or upon the edge of the rail, were fastened so-called "snapper cleats," ingenious contrivances, of elastic wood or of metal, by which the lines were kept in their places while the men were fishing.

The bait-boxes were fastened on the starboard side; these were wooden troughs, holding from one to seven or eight buckets of bait apiece. There were three of these bait-boxes, the largest placed outside of the rail at the foot of the main rigging, one on the quarter near the davit, the third was placed at the fore-rigging. The forward and after bait-boxes were usually less than half as large as the one amidships. The bait-mill was placed on deck, on the port side of the vessel, near the main rigging. During the later years of this fishery many of the vessels carried on the deck at the foot of the main rigging on the starboard side a bait-chest divided into two compartments, the smaller one for the clam bait and the larger one for the ground menhaden bait. On such schooners as were not provided with a bait-chest, the ground bait, or chum, was kept in barrels. Two of these barrels were generally kept near the starboard main rigging, so that those who threw out the toll-bait could refill the boxes with as little loss of time as possible.

The hold was left unobstructed by bulkheads; the ballast was usually gravel or pebbles and was not covered by a platform. Some vessels carried part of their ballast in barrels, throwing it overboard when the barrels were needed for fish. The number of barrels carried by a vessel would vary, according to her size, from one hundred to six or seven hundred, part of these being filled with salt and bait. The mackerel-hookers usually carried a single boat (of the yawl pattern) at the stern. Occasionally vessels going to fish on the coast of Labrador, or at the mouth of the Saint Lawrence, or even on the coast of New England, carried a number of dories or other boats, which were used by the men when they fished in the harbors.*

4. APPARATUS AND METHODS OF FISHING.

THE MACKEREL JIG.—The mackerel jig is said to have been invented about the year 1815, by Abraham Lurvey, of Pigeon Cove; according to other authority by Mr. Thurlow, of Newburyport.† It is simply a hook, round the shank of which has been cast a plummet of lead, pewter, or tin, somewhat globular at its upper end and tapering down toward the bend of the hook. At the upper end is a hole, through which a fishing line is bent. The weight of a mackerel jig has varied from a quarter of an ounce to three or four ounces at different times during the history of the fishery. At first they were made much heavier than they have been in later years. At present many fishermen, when using jigs, prefer them very small. It has been stated that each fisherman has from

*In certain localities the mackerel could only be taken to good advantage among the rocks close to the shore, and the men fished from small boats rather than from the side of the vessel.

†According to Captain Merchant, the "mackerel jig" was introduced at Cape Ann about 1815. Mr. Abraham Lurvey, of Pigeon Cove, was one of the first to use them, and was supposed to have invented them. The advantages of this new invention immediately brought it into general use. Before "jigs" were devised, the "gangings" of the mackerel lines would frequently break when the fish was jerked or "slatted" off the hook; when the jig is used this rarely occurs. Before the time of the jig it was customary to bait the hooks, when mackerel were plenty, with pieces of pork "as big as a four-pence-ha'penny."

According to Captains Daniel Cameron and John Grey, of Southport, Me., Edward Caiss, a fisherman of Hingham, Mass., invented the mackerel jig between the years 1810 and 1814, and by 1829 it had come into general use on the coast of Maine. It was introduced into Maine some time before 1829, but by whom no one knows.—[EARLL.]

seven to twelve fishing cleats in his berth at the rail. On these cleats are fastened an assortment of lines with jigs of various sizes, the heaviest being used when the mackerel are biting fast or when the wind is blowing fresh; the lightest, when the water is very smooth, or when the mackerel are "picking," or nibbling daintily.

The fishermen always made their jigs in molds of metal or soap-stone, this operation being similar to the old-fashioned method of making bullets. In former days these molds were made of iron, but many of the fishermen, being dissatisfied with the shape, constructed them for their own use of lead. At present the soap-stone jig molds and the lead and pewter constitute a part of the outfit of a vessel.

When jigs were first introduced, however, it was customary for fishermen to cast them for themselves in molds improvised in buckets of sand or ashes, afterwards beating into shape the rough castings, and boring the hole for the line. This custom was prevalent on some vessels as late as 1850. In the later years of this fishery the fishermen became very critical in the matter of jigs, and were not satisfied unless they were elegantly shaped and brilliantly polished. The lines were six or eight fathoms in length, of cotton, being either hawser or shroud laid. Of later years these have always been of cotton. In early days, when the heavier jigs were in vogue, much larger lines were used than at a later period. Since 1860 it has been customary to use a kind of snood, called "snapper-line," made of strong linen thread, and usually colored blue. The "snapper-lines" are from 15 to 18 inches long, one end being bent to the jig, and the other fastened to the fishing-line with what is called a "water-knot." During the voyage the lines are generally coiled up and hung upon the fishing-cleats on the waist when not in use. Besides each man's stock of lines, with jigs of different sizes, fastened to the cleats at his berth, a quantity of extra lines and hooks are carried by the vessel.

THE MACKEREL FLY-HOOK.—The mackerel fly-hook, formerly very popular and introduced before 1850, has been discontinued since 1860. This is an extra hook, on a ganging from 12 to 15 inches long, fastened to the jig-line 8 or 10 inches above the jig. Not being weighted, this hook floats at an angle when the jig is sinking, and by using it two mackerel are sometimes caught at once, one biting at the jig and one on the fly-hook. The fly-hook went out of favor because it was liable to become entangled with the other fishing gear.

THE MACKEREL-GAFF.—The mackerel-gaff is an iron rod a quarter of an inch in diameter, 3½ feet long, having at one end two recurved sharp points about 2 inches long, and separated at the extremities by an interval of one-half to three-quarters of an inch, returning in a line parallel with the direction of the rod. The mackerel-gaff is fastened to a wooden handle about 10 or 12 feet long, and was used when the mackerel were schooling thickly alongside of the vessel and were not inclined to take the hook. The gaff was thrust among the fish and rapidly drawn back, often impaling one and sometimes two mackerel at a time. This implement has not been used since the introduction of seines and but rarely during the last twenty years.

THE MACKEREL "BOB" OR "BOBBER."—This is an instrument resembling the mackerel-gaff in the manner of its use. In its rude form the bob was a stick of wood, around the end of which three or four cod hooks, with their barbs filed off, were fastened. The same idea has since been developed in various ways. The bob is fastened to a string and drawn through a school of fish, impaling them in the same manner as the gaff. This instrument was discontinued long before the gaff, and, in fact, has never been so popular. These bobs were used only when the mackerel were schooling in great numbers alongside of the vessel and refusing to bite.

BAIT AND APPARATUS FOR ITS PREPARATION.—Bait used in the mackerel fishery is of two kinds, (1) that put upon the hooks and (2) that thrown into the water to attract the fish.

The method of baiting the jigs which has been adopted by mackerel fishermen is somewhat peculiar, and a description of the process may be of interest in this place.

As a rule, when a mackerel schooner first arrives on the fishing ground and is about to begin fishing with hook and line, the jigs, which are to be immediately used, are baited with small circular pieces of pork rind, two or three of these being put on each hook. Sometimes, however, no one but the skipper uses pork-rind bait, the other members of the crew preferring to wait until some mackerel are caught from which they can procure a supply of bait for their hooks. The favorite way of baiting mackerel hooks is as follows, namely: Several thin strips, about a half inch wide and 3 to 5 inches long, are cut either from the belly of the mackerel or from the lower portion of the body on either side of the anal fin.* When a sufficient number of these slices have been obtained they are cut into sections, each of which is, approximately, a half inch square. A large number of these pieces are put on the hook, completely filling the bend, after which the baits are scraped with the back of a knife in such a manner as to remove everything but the tough white skin, which, when distended in the water, forms a soft pulpy mass about the size of the end of one's forefinger; but this can be contracted into a very small space, and thus afford the eager fish ample opportunity to secure a good hold of the hook while seeking the tempting but yielding morsel upon it. A bait of this kind will last more than an hour without being renewed, even when mackerel are biting sharply. When the fish are "picking" or less inclined to take the hook, a fisherman is often not obliged to bait his jigs more than once in a whole day. Sometimes the fishermen cut out a small circular piece from the throat of the mackerel, which they place on their hook above the scraped bait. This throat piece is quite firm, and for awhile prevents the soft skins composing the bait below it from being entangled on the point of the hook and thus preventing the latter from easily catching the biting fish.

In the early days of the mackerel hook fishery the toll bait chiefly used was made of small mackerel, and sometimes of large ones too when small fish could not be obtained. The viscera of the mackerel were also frequently used in the absence of better. From 1835 to 1840 menhaden came into general use, and were subsequently always in high favor. They had, however, been in common use by Gloucester fishermen at the very commencement of the century. They were caught in gill nets. It was the custom of the Gloucester people to leave home a little after tea, set their nets off Kettle Island, and lie there till about midnight. They would then haul their nets, pick out the fish, and start off to the mackerel grounds.†

There can be no question that the custom of chopping up small mackerel for bait was detrimental to the mackerel fishery in succeeding years, and that the introduction of menhaden was a benefit to the fishery in more ways than one. As a "toll bait" for the mackerel, menhaden is believed to be better than any other fish; the mackerel seem to prefer it; and the presence in its flesh of a quantity of oil renders it especially convenient for the use of fishermen, since in the process of "chumming-up," presently to be described, a small quantity of ground menhaden bait will spread over a large area of water. In the Report of the Commissioner of Fisheries, Part V, pp. 143 to 147, may be found a discussion of the comparative merits of herring and menhaden as a bait for mackerel.

The quantity of menhaden bait carried by a mackerel schooner on a trip of two and a half to three months to the Gulf of Saint Lawrence varied, according to the size of the vessel, from 25 to

*Strips for bait cut from near the anal fin are usually preferred, since they cannot so easily be torn from the hook as can the fatter and tenderer strips taken from the abdomen.

†Mr. Earll writes: "Daniel Cameron, of Southport, states that pogies were first used in Maine about 1844, and by 1846 had come into general use. People of this section claim to have introduced the menhaden or pogy, *Brevoortia tyrannus*, as mackerel bait, but with whom the practice originated I was unable to learn."

40 barrels. In addition to this they were accustomed to carry 5 to 10 barrels of clams. Capt. Sylvanus Smith, of Gloucester, stated to the Halifax Commission that a vessel fitting out for a four months' trip to the Gulf of Saint Lawrence would need to be supplied with 40 barrels of pogy bait, worth $6 a barrel, making $240, and 10 barrels of clam bait, worth $8 a barrel, making $80.*

Colonel Low's statement, copied from the trip-book of the schooner Oliver Eldredge, which sailed to the Gulf of Saint Lawrence August 5, 1875, arrived at Gloucester November 2, 1875, having been absent two months and twenty-eight days, obtaining 224 barrels of mess mackerel, worth $1,771.83, shows that she fitted out with 55 barrels of slivered pogies, at $6.50 per barrel, making $357.50, and 7 barrels of clams, at $6, making $42.

In 1867, when almost the entire mackerel fleet fished with hooks, the amount of menhaden bait consumed by Gloucester alone amounted, by the estimate of Mr. Joseph O. Proctor, to 6,500 barrels, and the total consumption by the United States of mackerel bait must have exceeded 25,000 barrels. In addition to this more than 1,000 barrels of clams were used. In 1877 another estimate was made of the quantity consumed by Gloucester. The purse-seiners were then in a large majority. The whole amount consumed by a seining vessel does not exceed 5 or 6 barrels in a season. Gloucester had, in 1877, about 50 "mackerel-hookers," using about 2,400 barrels of slivers, while the seining fleet used about 600 barrels more. The entire amount of menhaden bait consumed by the mackerel fleet of the United States in 1877 did not probably exceed 8,000 to 9,000 barrels of slivers, or 24,000 to 27,000 barrels of round fish.

The menhaden used for bait in the mackerel fisheries was formerly, when a larger quantity was in demand than at present, obtained to a considerable extent from Gloucester vessels fishing expressly for menhaden in the vicinity of Cape Ann and in the Gulf of Maine.

Capt. F. J. Babson, of Gloucester, whose account of the bait fishery of Cape Ann is quoted elsewhere, states that in 1873 there were over 60,000 barrels of round menhaden taken in his district, while in the same year vessels belonging to the Maine Oil and Guano Association sold of bait 2,977 barrels; in 1874, 10,400; in 1877, 10,795. From the bait fisheries about Marblehead and in the vicinity of Provincetown, according to Mr. Lowry, from 1,000 to 2,000 barrels of bait were taken in 1873. At Chatham, from 1872 to 1877, the average catch was about 5,000 barrels. A large portion of all of these fish, however, was sold to the vessels engaged in the George's Bank cod fishery. Considerable quantities also were obtained about Salem, and in the Merrimac River, a portion of which went to the mackerel fishery.

It was the custom of many of the vessels belonging to the spring mackerel fleet to devote a considerable time to obtaining a supply of bait for their own use during the summer fishery. In addition to this quite a number of vessels were fitted out each spring to go to Seaconnet and other places in that vicinity for the purpose of securing cargoes of menhaden slivers to sell to the early fleet going to the Gulf of Saint Lawrence. Cape Cod vessels were accustomed to dress their bait in a peculiar manner. They did not sliver them in the ordinary way, but salted them down "round," simply eviscerating them, cutting off the heads and the thin parts of the belly, and making slits in the sides.

These vessels obtained their bait from the pound-net fishermen at various points on the coast of southern New England, especially in the vicinity of Seaconnet, Rhode Island, and also from the various fishing gangs connected with the oil and guano factories.

In addition to the vessels which thus obtained supplies of bait for their own use, there was a fleet of bait vessels which annually proceeded to the same localities in the spring to obtain bait for

* Proceedings of the Halifax Commission, 1877, Appendix L, p. 334.

sale to the vessels of the mackerel fleet not otherwise supplied. The number of baiters was five or six.

The price of menhaden for bait varied with their abundance. In Gloucester, in 1873, according to Captain Babson, 60,000 barrels of round-fish made 20,000 barrels of slivers, worth $4 a barrel to the producer. At Marblehead the price in 1876 averaged $1 for fresh and $6 for salt bait; at Chatham, $1.50 fresh; at Nantucket, 50 to 75 cents; and at Martha's Vineyard, 50 cents. In Narragansett Bay bait sold in 1871 for $1 to $1.50 per barrel, fresh. The regular price from 1867 to 1877 at the mouth of the Merrimac River was $1 per barrel; probably 1,000 barrels of slivered fish were prepared in 1876, which sold for $5 a barrel. Boston and Gloucester vessels were accustomed to anchor at the mouth of the river and wait there for supplies of bait. At one time in 1877 there were probably twenty-five schooners waiting.

The process of slivering and salting menhaden is described in the chapter on the menhaden fishery.

The manner of preparing the slivered menhaden or other fish for toll-bait is very simple, and is essentially the same as that employed in early days, when it was the custom to grind up small mackerel for bait. Captain Atwood remarked in his testimony before the Fishery Commission at Halifax: "We now use menhaden for bait, but when I first went fishing we did not do so; our practice then was to grind up small mackerel for the purpose. Any quantity of these mackerel were at that time to be had for the cost, and plenty are to be met there now. These fish were of no account then, and so we ground them up for bait. And when we could not obtain them we ground up what we call gurry, the inwards of the fish with the gills attached. American fishermen, when they fish with hooks, use menhaden bait almost exclusively. The superiority of this over any other is proved by the fact that when they can't get menhaden they won't take any other. At first mackerel fishermen were afraid of this bait; it was a very bony fish, and they even thought that if it was cut up for bait the mackerel would get sick of it owing to the number of bones. There is a species of fish belonging to this family found on our coast which is exceedingly fat; we call them blue-backed herrings;* and some prefer this fish for bait, as it is not so bony as menhaden, but when the mackerel got to be worth having, about everybody adopted menhaden for bait; it is the cheapest bait."†

To prepare menhaden for use in the mackerel fishery, the slivers are ground up into a mush which is called "ground bait." The slivers are passed through a bait-mill, which is a machine somewhat resembling a farmer's feed-cutter. The fish are thrown into the hopper, and, by the agency of a roller operated by a crank at the side of the mill, are passed through a complicated array of sharp knives arranged upon the sides of the mill, and in spiral rows upon the roller. The bait is usually ground at night by the watch on deck. As a rule, the bait is run through the mill twice in order to make it fine enough. When the vessel has no bait-mill, which at present is rarely the case, the fish are cut up with a hatchet or scalded with boiling water in a tub. Bait-mills were first introduced about the year 1822. Prior to the introduction of the bait-mill all the bait was cut up at night with the hatchet, by the watch, upon a chopping-block, which was a large flat-topped piece of wood resembling a butcher's meat-block. The veterans of this fishery relate with great glee how they used to be kept awake all night by the pounding of the bait-cutter over their heads, and contrast the present usages with those of former days. When there was leisure in the day-time, three or four men would work at the block together, each chopping with his own hatchet.

* The Glut-Herring, Saw-belly, or Kyack, *Clupea æstivalis* Mitchill.

†N. E. Atwood, Proceedings of the Halifax Commission, Appendix L, p. 42, September 19, 1877.

In this way a constant supply was kept on hand. Bait which had been ground was packed in barrels full of pickle and covered up.

The earlier bait-mills were very rude affairs, the teeth being common nails driven into the barrel and into the sides of the mill and broken off, leaving jagged ends which tore the bait into pieces. Later these were filed down to a point, while at the present time the teeth are arrow-shaped, made of steel, and are attached to the wood by means of shanks made especially for the purpose. Bait-mills are now manufactured by various mechanics at the different ports, those made by Adolph Voss, of Gloucester, being considered among the best. The cost of a good bait-mill is from $8 to $15.

According to Col. D. W. Low, the first bait-mill was made in 1820, of nails driven in lines across two wooden cylinders and then sharpened. The first one made for grinding or cutting with knives was made in 1822 by Gorham Burnham, and they were driven into cylinders in the same manner. In 1823 he commenced putting in the knives in spiral form, which form has continued in use ever since. He has made and sold in one year $1,600 worth at $10 each, besides making anchors and other work.

The first bait-mill taken to Southern Maine was bought in Gloucester in 1827 by Mr. John Cameron, of Southport, for use on the schooner Echo.*

The manner in which the labor of grinding bait was distributed among the different members of the crew after bait-mills came into general use varied upon different vessels. Sometimes each man had his "bait-day," upon which, in addition to his regular labor of fishing, he was expected to grind bait for the use of the vessel.

When fish were abundant the quantity used might be as great as 5 or 6 barrels a day. The bait-cutter was expected to have a supply of bait ready, and when there was promise of good fishing the next day would grind what he thought would be needed for the next day's fishing during his watch at night. When he was not forehanded and the fish were abundant he suffered considerable loss, since he was obliged to work at grinding the bait while the others were fishing, and thus failed to obtain his share of the fish.

On some vessels, in order to obviate this difficulty, it was customary for each man to grind a barrel in his turn, the boys doing their share of the work by cutting the clam bait. The order of their succession was determined by their position at the vessel's rail, the man farthest forward taking the first turn. On other vessels, if a man was not on deck in the morning to help hoist the sails, the penalty for his absence was the grinding of a barrel of bait, a task which required about an hour and a half for its performance.

When the bait has been ground it is placed in barrels or in the bait chests. The ground bait is an oily mass of yellowish color, resembling in consistency sausage meat. Before it is used water is added to it, and it is then reduced to the consistency of porridge. It now becomes a yellowish slushy liquid with an oily smell, and in this condition occupies about twice to three times the space that it did before water was added. In this condition it is sometimes called "chum" or "stosh."

Mode of fishing.—The present method employed by mackerel schooners of fishing with hook and line while the schooner lies adrift was first practised in Massachusetts at the beginning of the present century, and the use of toll-bait began about the same time. According to Capt. Epes W. Merchant, the first man to introduce this method of fishing in Massachusetts Bay was John Story, of Rockport, about the year 1804.

The method of "tolling" or "chumming up" the fish by the use of this ground bait resembles

*Statement of Daniel Cameron and Capt. John Gray, of Southport, Me., obtained by R. E. Earll.

the process of calling up a flock of fowls by scattering corn over a large piece of ground. The oily bait is thrown over the side of the vessel, and as the latter drifts along and the bait spreads the fish are attracted by the floating particles most remote from the vessel, and swim up toward the source of supply.

The use of toll-bait originated with the shore fishermen, who crushed the oily menhaden under foot with their heavy fishing boots, washing the pulpy mass of flesh and the oil with buckets of water out through the scuppers of the vessel. Another statement, and perhaps the correct one, is that at first the fishermen made toll-bait by boiling a codfish or haddock until it was nearly cooked, when it was taken by the tail and beaten over the sides of the boat or vessel, causing the fibers of the fish to separate in small pieces, which, because of their whiteness, made a very attractive bait. This practice was still in vogue among the boat-fishermen of Maine as late as 1849 and 1850.

The process of throwing toll-bait, of late in practice, may now be described. Several buckets of the ground bait are put into the boxes, the positions of which have already been described, and to it several buckets of water are added, the mass being thus reduced to a proper consistency by stirring it up with the bait-heavers, which are scoop-shaped contrivances made of tin on the ends of wooden handles 2 or 3 feet in length. The vessel is "hove to" under mainsail and foresail, or sometimes under mainsail, making a square drift to leeward. One man—generally the skipper—stands forward of the main rigging with the bait-heaver and throws out the bait, something in the manner of a man sowing seed broadcast, by a sweeping motion of his right arm, scattering it over a space of 15 or 20 feet along the side of the vessel. The oily particles slowly sink and spread out under the influence of the whirling eddies caused by the receding vessel. As the vessel drifts away and one scattering of bait is on the point of disappearing from sight, another lot is thrown, and so a succession of waves of bait is left in the wake of the vessel. In the mean time the man who is throwing the bait puts out two lines and thus ascertains whether the mackerel have been attracted to the sides. As soon as the fish begin to bite, the man sings out, "Here they are!" or "Here they gnaw!" and the crew rush to their places and begin fishing.

When the fish appear, they are sometimes in small numbers and bite daintily, but often they come in immense schools and bite as fast as the hooks touch the water.*

On these occasions the deck of the vessel presents a scene of great activity and excitement.

Let us try to imagine a scene in the Gulf of Saint Lawrence. We are on the deck of a clipper schooner from Gloucester, standing along with the four lower sails and the main gaff-topsail set, a fresh breeze blowing from the southwest; the sky is overcast, and the sea comparatively smooth; within the plane of vision are the white sails of some 250 schooners, most of which are hove to, a few tearing along under press of sail seeking new positions; here and there among the fleet is a vessel with flag set at her main peak or at her main topmast head; this is to indicate that she has

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* "*Jigging mackerel.*"—"Jigging mackerel" is a method peculiar to mackerel catchers that superseded the old way, called "trailing," or taking them while the vessel was under headway. The manner of jigging is peculiarly interesting to new beholders. The vessel is kept comparatively motionless; a large quantity of poor mackerel, chopped into mince-meat, is thrown upon the water, which brings them to the surface. So much of this has been done that it has, in a great measure, destroyed their appetites, and sharp-pointed hooks of a sufficient length to reach the fish have been resorted to.

A line of the color of the water, called the jig-line, attached to a lead of a finger's length, say one-half inch in diameter, diminished at the end towards the hook, which is solid in the lead called a "jig-lead." Bait of such as is thrown overboard is put on the hook and thrown also among the "floating bait," or more properly the floating fish. Thus prepared, the fisherman has little else to do but to draw in the line and snap off the fish in a tub, prepared for that purpose, a little faster than can be easily imagined by the land fisherman. From 50 to 80 barrels have often been taken on a good "fishing day" in this way by a crew of six or eight hands; oftentimes several boys comprise a portion of the company. (Barnstable Patriot, November 15, 1836.)

completed her fare and is homeward bound. Some of these are lying to, and are still fishing, while others have all sail set, and are heading for the Strait of Canso on their homeward way. A few miles to the northeast looms up the rugged shore of the Magdalen Islands, its high outline here and there broken by long stretches of sandy beach; a train of great white gannets crosses our bow, five or six of them rapidly flying close to the water; suddenly the leader disappears beneath the water, and his companions rise up for a moment and then plunge down head foremost after the fish which they see. The movement is perceived by other gannets, and they flock in from all directions and share the feast. As we speed along two or three of these birds, which have filled themselves to repletion, are swimming in our course, unable to rise, and, in order to escape, they disgorge their stomach-loads of fish and flap away just before the vessel reaches them. We now approach the fleet, and pass by the leeward vessels which are hove to, the starboard rails of which are lined with men excitedly plying their lines. Our skipper stands on the quarter with his glass to his eye, trying to determine which portion of the fleet is meeting with the best success. He selects a berth near the middle of the fleet, and thither he directs the course of the vessel by word to the steersman. We thread our way in a zigzag course among the drifting vessels, sometimes escaping by a few inches only the thrust of a jib-boom, and again almost snapping off the main boom of some other vessel. At length we approach the selected position and heave to, coming up sharply to the wind with the mainsail hard aback. The skipper takes his position at the main rigging and begins throwing bait, at the same time putting out his lines for trial. After the vessel is hove to, the men are lounging about the deck, yet in expectant attitudes. At a little distance from the rail stands a row of barrels, one opposite the berth of each man. These are called "strike" barrels. The lines, with the jigs attached, are coiled upon the cleats or lie upon the rails, each man having examined his own and prepared them for immediate use. At last the skipper is seen to rapidly haul in his line, pulling a glittering mackerel over the rail, and, by the peculiar motion known to the fishermen as "slatting off," the fish is jerked over his right shoulder into the barrel, while the drumming of the mackerel against the bottom of the barrel announces to the men that the fish have struck. The men rush to their positions, and a scene of great activity and excitement begins. The fish are now within 4 or 5 fathoms of the side of the vessel, but they soon come much nearer; looking over the rail we see their mottled backs as they swim to and fro alongside the vessel. The lines are shortened up as the mackerel rise, and now the time required for throwing over the jig and jerking it back with a mackerel fast to it is only a few seconds. The men throw out their lines, pull them in, and, without glancing at the fish, dexterously "slat" them into the barrels, the jigs being torn out of their mouths by the same motion which casts the line back into the water; two twists of the wrist are sufficient to accomplish this feat. The mackerel are large—"No. 1's"—and in fifteen or twenty minutes the best fishermen have their barrels full. When a man's barrel is filled he springs from the rail, rolls it back towards the center of the deck, and puts an empty barrel in its place. The fish may continue actively biting for ten minutes or for several hours, but usually the sharp biting is over very soon, and the mackerel begin to "pick." Now the work is less exciting, though much more exacting upon the skill of the fishermen. When the fish are "picking," a high-line fisherman will catch quantities, and the greenhorn will catch none, and even among the most skillful fishermen there is a great difference in their success at this time.

It should be stated that all the time mackerel have been biting, four men have been actively employed in throwing bait over the side, at the same time attending to their lines like the remainder of the crew. The cook heaves bait in the position farthest forward, and one of the boys in the

position farthest aft, while amidships the skipper and one of the most experienced of the crew are similarly engaged.*

When the fish begin to "pick" the skipper reconnoiters for a better position, and finding that other vessels are having good fishing, orders the crew to coil in their lines and to make sail; away we go in search of another "spurt of mackerel."

The excitement among the crew, when the mackerel are biting fast, can hardly be described. When the fishing begins, the drumming of the mackerel in the empty barrels is inexpressibly cheering to the fishermen, especially if they have been unsuccessfully hunting for fish on previous days, and adds to their excitement. This sound ceases as the barrels begin to fill up, the resonance of the wood being deadened by the accumulation of fish; it is, however, from time to time repeated as empty barrels are substituted for those which have been filled. Every man is striving to the top of his bent to catch as many mackerel as possible while the "spurt" continues, and, if possible, to catch a larger share than any of his comrades. The emulation to be "high-line" for the day and for the season is extreme. The number of barrels caught by each man is carefully noted, for upon his relative success depends his proportion of the proceeds of the voyage and his reputation as a fisherman. In a single day a high-line fisherman has caught from 10 to 15 barrels, and since each barrel contains from 150 to 200 mackerel, the rapidity of the men's movements throughout the day may be estimated. In seven or eight hours' fishing he has probably lifted over the side 2,000 to 3,000 fish, to say nothing of throwing over his jig and bringing it back empty almost as many times more. Such cases as this are exceptional, since mackerel rarely continue biting long enough to allow such a number to be taken. At the same time, when a much smaller number is caught, the activity of the fishermen is something to be wondered at.†

The confusion and excitement are increased by the frequent snarling of the lines and the attempts to straighten them out again. As has been stated, each expert fisherman has ten or twelve lines in his berth, and changes from one to the other according to the rapidity with which the fish are biting or the strength of the wind. Much experience and skill are necessary to enable the fishermen to make these changes understandingly. Little is said while the fishing is going on; the men lean far over the rail in strange attitudes of expectancy with one or two lines in each hand, the hands moving up and down and constantly hauling in and throwing out one of the lines at a time. When it is necessary to haul in one of the lines the others are allowed to drop upon the rail.

We have described one phase of the life of a mackerel fisherman, but experiences like this may occur only a few times during a season. Mackerel vessels are constantly under sail, cruising hither and thither over great areas of water on the lookout for fish, heaving to and trying more frequently without than with success, except in extraordinary seasons. At night they are hove to, or when mackerel are scarce are making long passages from one ground to another. Information as to the location of the schools of mackerel is passed from vessel to vessel. As they meet, the vessels almost invariably speak each other and compare notes upon the position and abundance of fish.

When a vessel is seeking fish, and heaves to for the purpose of tolling them up, she will continue in this position, as a rule, for about an hour, sometimes longer, when there is any prospect

* On the mackerel "hookers" the cook stood to fish just aft of the fore-rigging. The large schooners sometimes had a boy forward of the fore-rigging, but this was not the rule by any means. Each man or boy had a certain number of inches measured on the rail and assigned him as his berth. The length of a berth at the rail varied from 2½ to 3 feet.

† LARGE CATCH OF MACKEREL.—Schooner Bloomer, of Hingham, with a crew of ten men, caught on Thursday last, between 10 a. m. and 2 p. m., 5,700 mackerel with the hook and line. (Barnstable Patriot, May 28, 1861.)

of success. Sometimes the mackerel, however abundant, will not rise to bait; they are very capricious; at other times in the same day they will be exceedingly voracious. One of the common tactics of the mackerel fishermen was that of running round a school; when the fish could be seen, the vessel would make a complete circle, surrounding them at the same time with the line of toll bait. The effect of this maneuver was to keep the fish from moving away by placing the bait in such a manner that whichever course they took the fish must invariably meet with and be attracted by it to the vessel's side. It frequently happened, however, that the schooling fish took no notice whatever of the toll bait, either because they were not hungry, or were engaged in feeding upon some form of crustacea, of which they are exceedingly fond.

The practice of "lee-bowing," the method of which, so far as the management of the vessel is concerned, has been described in another place, was simply to "heave to" to the leeward of another vessel which was lying to and had a school of fish alongside, and, while so doing, to throw a quantity of bait overboard; this bait passing under the bottom of the first vessel would attract the fish, which would then follow the course of the new bait, passing to leeward under the first vessel and appearing alongside and close to the vessel which was executing the maneuver of lee-bowing. The success of this maneuver is sometimes thwarted by the crew of the first vessel throwing over such a quantity of bait that the bait thrown by the second vessel is not noticed by the fish. In this act it is frequently the custom to use a considerable quantity of chopped clams, these being considered better to "hold" the fish alongside than the menhaden bait. The clam bait is also used on other occasions to "hold" the fish, or induce them to bite more rapidly when they are supposed to be tired of the ordinary bait.

A maneuver sometimes executed by the mackerel schooner is called "springing up." This is done when the mackerel are so close to the shore that the vessel cannot lie to and drift for them. It is accomplished by bringing the vessel to anchor and then putting a "spring" on the cable, the latter, which is a stout rope, being taken to the port quarter, and the cable veered out so that the vessel lies with her port side to the wind. The fishing is then carried on on the starboard side in the same manner as with vessels lying to.

In former years, when an extensive mackerel fishery was prosecuted in the vicinity of the Seven Islands and at the mouth of the Saint Lawrence River, much jig fishing was carried on by small boats sent out from the vessels. Each of the boats carried a small quantity of ground bait, which was used in the same manner as on the vessels. This method of fishing has also been practiced to some extent on the coast of Maine even as late as 1879.

Vessels occasionally returned home from the Gulf of Saint Lawrence to land their catch, leaving a portion of their crew to fish from small boats until their return.*

The above description of jigging mackerel has been written with special reference to the fishery in the Gulf of Saint Lawrence, since it was there that the jig fishing was most extensively prosecuted. The methods are the same, however, as those practiced on the New England coast.

5. THE CARE OF THE FISH.

CLEANING AND SALTING.—The manner of caring for the fish is essentially the same as that described in the preceding chapter, except that (the quantity of fish taken being much smaller, there was, of course, much more time for handling them) greater care was taken, and the fish were

*Schooner B. D. Haskins lately arrived from Bay Saint Lawrence with mackerel; left five of her crew to continue the fishery in dories until her return on her second trip. (Cape Ann Advertiser, August 17, 1860.) Instances of this kind were rare.—AUTHORS.

uniformly of better quality. Many of the Gloucester mackerel-hookers were accustomed to divide their crew into dressing gangs of two each instead of three, as at the present time on the seining vessels, one of these men splitting and the other gibbing. It was the duty of the splitter to get the barrels, fill them with water, and, when he had split more fish than the gibber could take care of, to aid the latter in his work.*

On the seining vessel, as we have seen, the mackerel are, in most cases, heaped on the deck; on the mackerel-hookers, the fish were already in barrels, and the order of proceeding was slightly different. The splitting-board was placed on the head of one of the "strike" barrels; the fish were taken out of the barrels, split, and thrown into the gib tub, where they were handled in the ordinary manner. The process of gibbing having been completed, the fish were "plowed" and put into the second barrel, which was filled with clean water. From this barrel they were changed into the barrel in which they were salted. The process of salting is as follows: A barrel of mackerel is emptied out on deck; a "gib-keeler" is filled with salt; one of the men now throws the mackerel into the "gib-keeler," while the other man "rubs" them in the salt by taking one in each hand; the back of one is then placed to the flesh of the other, and they are thrown into the barrel with the flesh side down. They are thus salted and packed away into barrels in successive layers, each (with the exception of the bottom tier) with the flesh side down.† A barrel of large mackerel can be salted in from five to ten minutes.

In order to cure mackerel successfully very fine salt must be used, and every part of the fish must be touched or it will spoil.‡ Careless salters sometimes leave "thumb-marks" where their thumbs touch the fish during the process of salting, preventing the access of the salt. These fish do not keep well.

It was customary on the "hookers" to let the mackerel remain on deck for several days after being salted, the length of time varying to a considerable extent, as it depended very much on the amount of fish taken. When the mackerel were well struck, or after they had been salted from two to five or six days, the barrels were "topped up" with fish, to make up for the shrinkage from the first salting, after which they were carefully headed up and stowed in the hold. If the men kept their catch separate, each one cut a private mark on the head of the barrel containing his fish. As a rule, the mackerel were "stowed down" whenever 40 or 50 barrels had accumulated on deck, but when fish were abundant and took the hook freely for several days in succession it often happened that more than a hundred barrels of fish would be caught before any were put below.

Capt. Epes W. Merchant, of Gloucester, informs us that the practice of salting mackerel was inaugurated at Gloucester in 1818. Scituate fishermen had begun this practice somewhat earlier. The methods of salting have not materially changed since that time. Previous to 1850 the vessels

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* The most general custom, perhaps, on the Gloucester vessels was to have two men in a gang, though this was varied a good deal on different schooners. Some crews preferred dress gangs of three men each, while others sometimes had four men working together, one of them "passing up" the mackerel to the splitter.

† The early method of packing them flesh up has been abandoned.

‡ This is the case when the mackerel are "rubbed," Liverpool salt being almost wholly used, since Cadiz salt, owing to its coarseness, has a tendency to tear or "ruck up" the flesh of the fish and give them a ragged appearance. Many of the Cape Cod fishermen, however, preferred to use Cadiz salt, believing it to be better for curing the fish than Liverpool. Their manner of applying it was quite different from that which has been described. Each man salted his own catch. Placing a wash-barrel of mackerel at his left hand, an empty barrel in front of him, and with a bucket or basket of salt at his right, the fisherman rapidly transferred the fresh fish into the proper barrel, placing each flesh up, and scattering over it with the right hand a sufficient quantity of salt. An expert can thus take care of many more fish than any one unacquainted with the method would believe possible, though it is safe to say, mackerel can be handled more expeditiously by the process of rubbing, and for this reason the Cape Cod style of salting has never come into favor at Cape Ann and on the coast of Maine.

engaged in mackerel fishing were generally accustomed to carry butts, in which the fish were salted.

Capt. Chester Marr tells us that in the early days the mackerel fishermen made a practice of salting the mackerel in hogsheads, which were placed in the hold, standing on end, with stone ballast stowed in the "spaces" between them. When a vessel was loaded she would hold about 10 butts, or about 50 "wash-barrels." These butts were used until about 1850.*

MACKEREL PLOWS.—The mackerel plows, to which frequent allusion has been made, are also known to the fishermen by several other names, such as rimmers, reamers, fatters, and fatting-knives, in the same and in different localities. The original object of using these instruments may be said to have been a "trick in the trade," although the fact of their being employed at the present time is so well known that no one considers it any longer a secret, neither has it been for many years. The quality of mackerel is determined not only by their size, but also by the richness or fatness which they acquire as the season advances, and the opportunities for obtaining food are better than during the spring. In the spring, when they approach the coasts of the Middle States and Southern New England, they are in a poor and lean condition, and remain in such a state until after they have deposited their spawn. After the spawning season is over the schools then seek their favorite feeding grounds, and the fish soon begin to exhibit much improvement in their condition. During the month of June this improvement is first noticeable, and by the last of August, and sometimes even at an earlier date, the mackerel have arrived at their finest condition and remain so until they leave the coast in the fall. As the fish fatten, the belly, or that portion which covers the abdominal cavity, increases in thickness, and the quality of the mackerel can be more easily and certainly determined by noticing this particular portion of it than in any other manner. The mackerel are invariably split along the back from the snout to the tail in such a manner that they will lay open and flat after the viscera has been removed. It is a fact well known to persons familiar with this fish that when they are in a fat condition the sides of the abdominal cavity will crack open along the entire length when the fish are opened for the purpose of removing the viscera. The depth of these cracks or "breaks" shows the relative fatness of the fish. As these cracks occur about half way from the backbone to the center of the abdominal cavity, it will be readily seen that by using an implement for making the cracks a little above or nearer to the backbone than where it would naturally be and where the belly is considerably thicker, it will give the fish the appearance of being much fatter than it really is. As previously stated, the depth of the

* The largest of the mackerel schooners had sufficient capacity for stowing 20 or 25 butts, besides a number of barrels alongside of them in the wings on each side of the hold.

When salting mackerel in these casks, the salters worked in the hold. A gib tub was filled with salt and set on top of the butts near the hatchway, and one man threw down the mackerel from the deck into the salt box (or gib tub) while two others standing alongside of the butts did the salting—one "rubbing" the fish and the other packing them away in the proper place. When the cask was full a large stone was placed on top of the fish to keep them beneath the brine so that they would not get rusty. Each man usually had a hogshead of his own for the reception of his fish; that is, if each of the crew kept his catch separate. At that time, however, it was quite generally the custom to "go on shares." This term, as then understood, differed radically from what is now meant by the same expression, and may be described as follows: The crew were shipped as much upon their merits of good seamanship and steady habits as for their skill as fishermen. Each man was provided with a "strike tub"—a half hogshead—and for the first few days' fishing the skipper would note the catch of each of the men, and from this comparison would decide what share every one should receive. Thus some half dozen, perhaps, in a crew of 12 or 14 men would be assigned a full share. Though there might be some difference in the relative catch of these men, it was thought fair to consider a capable and reliable man a full sharesman, though he caught somewhat less fish than another who might not be so well experienced in other matters. The remainder of the men were allowed three-fourths or one-half of a share, as the case might be, their expertness in catching fish and other qualifications always being taken into account in settling their relative standing. Thus, if a vessel had a crew of twelve men, six of whom were full sharesmen, four three-quarter sharesmen, and two half sharesmen, there would be ten full shares, and a sharesmen would receive one-tenth of the crew's half of the proceeds of the voyage, while those having a smaller "lay" would be paid accordingly.

"break" is the test of the fatness of the fish, and is the guide by which the inspectors cull them into the different grades for market, provided always that they are of suitable size. Stringent laws have in past years been enacted in most of the New England States to regulate the method of inspecting mackerel, and the use of any artificial means to fatten them was for many years strictly prohibited. The introduction of the mackerel plow, like that of many other inventions, was the direct result of a need long felt by fishermen. Previous to its adoption it was the custom for the fishermen to attempt to improve the looks of their fish by increasing the natural break with their thumb-nails drawn along its entire length. This method was called "rubbing the mackerel." Later, a few began to use the back of the point of their bait-knives or splitting-knives for this purpose, by degrees venturing to place the cut a little higher than where it naturally belonged. The use of knives led to the introduction of plows, which soon came into general use, though the fishermen at first felt some hesitation about revealing the fact that their fish had been plowed.*

A comparatively poor mackerel would not open sufficiently in a natural way to pass for a No. 2, but the fishermen give them an inviting appearance to the buyer by the use of the plow, which they handle with remarkable dexterity, running the blade longitudinally along each side of the abdominal cavity with great swiftness, laying the sides of the fish open in such a manner that it may pass for a No. 2, and, perhaps, if it is of large size, a fairly fat fish may be culled as a No. 1 mackerel. It is but fair to say here, that, since the general adoption of the mackerel plow as a means of "fattening" the fish, the subject is so well understood by the dealers that they demand a finer looking fish than formerly, and the consumer, therefore, actually gets as good an article as before, and one that is much more attractive. This is especially the case when the size of the mackerel is not sufficient to pass for the best quality, or No. 1. A fish whose length is 13 inches and "of suitable fatness" is required for a No. 1, but it is easy to see that a fish of fine quality, though not exceeding 12 or 12½ inches, is just as good for food, notwithstanding the fact that it must pass for a lower grade and be sold for a much less price. For the past few years a very large portion of the mackerel caught on our coast have been "undersized," that is, not long enough to pass for the best quality, according to the inspection laws of New England; nevertheless they are in all respects quite as good as the larger and rarer grades.

As previously stated, the fishermen no longer make a secret of using the plow, and during the summer season, when the wharves on the eastern coast are filled with mackerel, the operators may be seen in the open air busily running the fish almost as fast as they can pick them up and throw them into another barrel. There are many styles of this type of knife, their patterns and designs being as varied as the fancies of those who make them. They are, with but few exceptions, made by the fishermen; some of them are exceedingly plain and rough, while others are artistically and elaborately decorated, often with imaginary uncouth figures or with fancifully carved leaves, wreaths, &c.

There are several knives of this character deposited in the fisheries collection of the United

* From a circular addressed to the masters and crews of mackerel vessels by Hon. James Barry, inspector-general of pickled fish for Massachusetts, dated May 2, 1832, we quote the following in relation to the use of the mackerel plow: "It is a mischievous error that fishermen have fallen into by salting their fish too slack, as has been often the case; and another by using the plow, which has given to the fish a false appearance, and has been a source of mortification to the fishermen, and they have in a great many instances found fault with the inspectors when the fault belonged to themselves in not taking care of the fish, which it was their duty to do, and which in many cases has been a ruinous business to purchasers. By a law of the commonwealth the inspector is required to throw into an inferior quality all mackerel which have been plowed, cut, or mutilated for the purpose of deception. It can be of no advantage to the fishermen, and I trust will never again be done."

Capt. N. E. Atwood says that some of the fishermen made mackerel plows with "the ends tipped with pewter and fine teeth on the edges so as to make the crease look rough, as though it were broken naturally; others had a knife in the end which cut the mackerel smoothly."

States National Museum, and among them is one factory-made rimmer, with a polished walnut handle and a curved iron shank about one-quarter inch in diameter; into the forward end of the shank is fitted a small cutting blade about 1½ inches in length, tapering to a point at the heel, and with a square-cut forward end. There are also other styles made by the fishermen, some having steel and others having copper blades, and one specimen made of wood, in the form of a human leg, the extreme end terminating in a thick-set flat foot, in the bottom of which is inserted or driven a silver three-cent piece, ground to a sharp edge, to be used as the knife or plow.

6. HOMEWARD PASSAGE AND DISPOSITION OF THE FISH.

When one of the vessels in the fleet has obtained a fare of fish, or the skipper decides to go home, sometimes with a partial fare, the flag is usually set at the maintop-mast or on the main peak. This custom was not so common on our coast as in the Gulf of Saint Lawrence. The fish being salted, the homeward passage was usually performed in a leisurely manner, unless, indeed, the return was made during the fishing season, and the skipper expected to make another trip, in which case the utmost expedition was used, and rapid passages were made. For several years it has been a common practice for vessels fishing in the Gulf of Saint Lawrence to land their fish at the Strait of Canso, or sometimes at Prince Edward Island, sending the fish home by steamer or freight vessels. This was only done when the vessel had obtained a large fare and there was a prospect of one or two more successful trips for fish that season. By this means vessels sometimes filled up three or four times in the course of the summer, obtaining, in some instances, as many as 1,100 to to 1,200 barrels.*

7. FINANCIAL PROFITS OF THE MACKEREL HOOK FISHERY.

Old-fashioned vessels were employed as seiners for a number of years from Gloucester, it then being thought by many of the fishermen that swift sailers were not so necessary for this branch of the fisheries as for some others. In this respect, as in many other things, there has been a radical change.

The expense of fitting out with seine, boat, &c., deterred many of the owners from sending their vessels seining, and the more conservative clung to the old method of jigging until the failure of mackerel in the Gulf of Saint Lawrence compelled them to adopt the seine or abandon the business.

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* The influence exerted upon the settlements in the Strait of Canso in the period between 1850 and 1870, by the trade thus derived from the mackerel fleet, was very remarkable. In many of the coves, on either side of the strait, small villages sprang up, and large store-houses and wharves were built where the American vessels could secure storage for their fish until they could be shipped, and also at the same time obtain supplies of salt, bait, provisions, &c., which they required for the prosecution of their voyages. This, of course, brought a great deal of money to the people of Canso, and many of the merchants who were not slow to take advantage of the circumstances became quite wealthy. Those were lively times in the strait, and it was not an unusual thing to see ten or twenty sail of mackerel schooners lying at Port Hawkesbury or at McNair's or some of the other coves discharging their cargoes and taking on board outfits for another trip. This afforded much employment to local residents and remunerative returns. Most of the people who owned wood lands devoted their time in winter to cutting and preparing for use a lot of fuel which they could readily dispose of the following summer to the American fishermen at good prices; and whoever was fortunate enough to have a small stream or brook running through his land near the coves usually derived quite a revenue from the American fishermen by charging 5 or 10 cents per barrel for the water which they were obliged to fill there.

Of late years, however, since the general introduction of the purse-seine in the mackerel fisheries, and the consequent failure of our fishing fleets to resort to the Gulf of Saint Lawrence during the mackerel season, a great change has taken place in the prosperity of the settlements at Canso. So much so, indeed, that many of the wharves and store-houses have been allowed to fall into decay and become nearly worthless from disuse. Most of the coves which were formerly the scene of busy life and activity during the mackerel season now have a comparatively deserted and forlorn appearence. Many of the merchants have moved away to Halifax and other business centers of the Provinces, while those who remain find their business much less remunerative than it was at the time when the Strait of Canso was frequented by a large fleet of American mackerel schooners, which were engaged in fishing in the Gulf of Saint Lawrence.

As a matter of course such large stocks and enormous profits were not obtained by the seiners years ago as they have made for the past few years, 1880, 1881, and 1882. Nevertheless, many of them did well. But a vessel's "fit out" for jigging costs comparatively little, and with a much *smaller stock more clear money would be left than if she went seining. This, together with the* fact that more or less risk is attached to seining—such, for instance, as losing the apparatus altogether, having the net torn, the boats stove, &c.—served to deter the timid ones from engaging in it until compelled to.

Rapid advances in the knowledge of using the purse-seine have been made within the past few years, which no doubt has had a strong influence in changing the hook fishery into seining. For a number of years it was believed that mackerel could not be taken except in shoal water, where the seine would reach bottom, and as a result of this but comparatively little could be done. More recently, the practice of seining in the night, tolling the fish alongside of the vessel and then surrounding them, &c., have added much to the profits of the fishermen.

The large net profits which were sometimes made by the mackerel hook fishermen previous to 1870 bore no mean comparison to the money cleared by the seiners of the present day, though, of course, the latter frequently get higher stocks. This, as mentioned above, is due to the difference in the cost of fitting out a vessel for hooking and for seining, the expense for the latter often being twice or three times as much as it would be for line fishing. The following account of some of the large mackerel stocks made by vessels engaged in fishing with hook and line we copy from the Fishermen's Memorial and Record Book:

"The largest stock made in the Bay of Saint Lawrence mackerel fishery was that of schooner Colonel Ellsworth, Capt. George Robinson, in 1865. She was absent about five months, her net stock amounting to $13,728.* The high-liner's share was $558; cook's, $582.

"Schooner General Grant, Captain Coas, in 1864, stocked in two trips to the Bay of Saint Lawrence $11,254.94 clear of all expenses.† The high-line made $502.24; cook's share $638.17.

"Schooner Nor' Wester the same year stocked $9,721.74 net in one bay trip; the high-liner making $308.60 and the cook $486.61.

"Schooner General Sherman, in a three months' trip to the bay in 1864, packed 612 barrels of mackerel, her net stock amounting to $9,696. High-liner's share, $575.06.

"Schooner Kit Carson, 1865, brought in 591 barrels of mackerel, having been absent about ten weeks. He net stock amounted to $6,542. High-liner's share, $260.

"Schooner James G. Tarr, in 1866, stocked $5,824 in a nine weeks' trip to the bay. Cook's share, $331.76.

"Schooner Seddie C. Pyle, in 1871, packed 1,070 barrels of mackerel caught off this shore,‡ in addition to 18,000 southern mackerel sold fresh in New York in the spring. Her net stock for the year was $10,561.66. High-liner's share, $491.38; cook's share, $708.52.

"Schooner Eureka, in six months' mackereling off this [American] shore in 1868, packed 935 barrels, her stock amounting to $10,748.33. High-liner's share, $440.82; cook's share, $473.70."

8. ITINERARY OF A MACKEREL VOYAGE TO THE GULF OF SAINT LAWRENCE.

By Colonel D. W. Low.

We go to Essex, a neighboring town on Cape Ann, 6 miles from Gloucester, or to the shipyards of Gloucester, where we see on the stocks, ready for launching, a schooner of 60 or 70 tons.

* Her gross stock—the amount her fish sold for—was doubtless about $16,000.
† Her gross stock would be between $13,000 and $14,000.
‡ New England coast.

built in that thorough and stanch manner which makes the American fishing schooner celebrated for her sailing and seaworthy qualities required in the hazardous business she was built for.

We next find the schooner alongside of the wharf in Gloucester, where she is made ready or "fitted" for a voyage to the Gulf of Saint Lawrence, called a "bay trip." Fifty-five barrels of pogies and 7 barrels of clams, with 50 hogsheads of salt in 115 barrels, and 16 barrels of water, are stowed by her crew in her hold, on top of which are stowed 335 barrels more with their heads taken out and put inside, both head and barrel being numbered. After the provisions, lines, hooks, &c., are on board the flag is hoisted and she is ready for sea, having cost to that time $7,700 for the vessel and $2,075 for her outfits. Had she been fitted for seining her outfits would have cost $750 more, making her total cost with outfits $10,525.

Leaving Gloucester August 5, 1875, we proceed to the Gulf of Saint Lawrence with seventeen hands, shipped "by the berth," according to their experience as fishermen, the best fishermen getting the best berths, which are nearest to and on each side of the master. The master's berth is forward of the main rigging on the starboard side, nearly in the center of the vessel. Formerly the berths to fish, with exception of the master's and cook's, were sold at auction on board the vessel after she had started, as high as $50 or even more being paid for first choice. The amount of the bids, called "berth money," was equally divided among the sharesmen, they paying the amount of the excess of their bid over the average share. The cook fishes forward, so as to be handy to his cooking. After each man's berth is decided upon, each one prepares the cleats for his lines on the bulwarks under the rail at his berth. "Jigs" are run in the "jig molds," and the lines, eight to twelve to each man, are neatly put upon the cleats ready for service. After passing through the Gut of Canso (stopping there for a little wood) the vessel is ready for fishing. Lashed on the "port" side of the schooner, opposite the skipper, stands the "bait-mill," at which each of the crew, excepting the master and cook, take turns, commencing with the youngest, in grinding bait. The slivers of pogies are ground up fine and clams are chopped with a long-handled chopper, which are mixed with the pogy bait, and some of it put into a box called the "bait-box," which is hung outside of the bulwarks, to the right of the master's berth, and water is added to it. After the vessel is "hove to," and she commences to drift to leeward, the master, with a "bait-heaver," throws the bait from the bait-box into the water fore and aft the vessel, to attract and draw the mackerel alongside. Some of the crew are below and others looking on, or perhaps put out a line with the skipper's to try for them. Soon the peculiar tapping of a mackerel's tail is heard on the bottom of a barrel, which, with the cry of "Here they are!" from the skipper, brings every man to his berth, and for a time the "strike barrels" standing a little in the rear and at the right of the fisherman, in which the mackerel are slat from the hooks, resound with the lively occupants. The best fishermen fish with four and sometimes six lines each. The "spurt," however, is soon over, and after "picking" one once in a while the master orders, "Take in your lines;" after which we haul in our mainsail, hoist the jib, and go on. The mackerel are then dressed, generally by gangs of three, comprising a "splitter," one to pass up the mackerel to him, and the "gibber;" the mackerel, after being split, are thrown into a "keeler," which is a shoal square box about two by three feet square, which are put on board in nests of three; the "gibber," with mittens on to prevent getting his hands sore from the bones, opens the mackerel, takes out the gills and entrails (which are thrown overboard after dressing the catch), and throws the mackerel into a barrel partly filled with water to soak the blood from them, which is called a "wash barrel"; after soaking, they are thrown into a keeler of salt, a few at a time, rubbed all over in the salt, and packed in a "sea barrel," 1 barrel of salt (3½ bushels) being used in packing 4 sea barrels. After the barrel is filled and the fish allowed to shrink it is filled up (sometimes there is not time

enough to allow it to shrink before heading up). The head of the barrel is put in reversed, on which the private mark of the catcher is cut in to identify it when landed, after which the barrels of mackerel are stowed in the hold. Frequently, when mackerel are scarce and time hangs heavy, industrious ones will "mess" their mackerel by scraping the blood from the backbone and cutting off the heads and tails, losing by the operation 13 pounds on a hundred, but making the mackerel bring more in the market for the labor.

During our voyage we sometimes tried for mackerel with others of the fleet one or two miles from shore, and being "hove to" together, and occasionally "picking" a mackerel which, as it glistened in the sun coming over the rail, no doubt led those on shore to suppose we were getting a good catch of fish, when 15 wash barrels would cover the whole catch for the fleet in several hours' fishing. The latter part of October finds us on the way home, at Georgetown, Prince Edward Island, where we put in for a harbor, paying $1 for harbor dues, and on 2d of November arrived at Gloucester, having been absent two months and twenty-eight days, and caught 250 sea barrels of mackerel.

The mackerel are hoisted out by horse-power, the crew paying for the horse in preference to doing the work by hand as formerly. After being landed each man's lot is stood upon the head together, with the marked head up. One of the crew unheads them, another pitches the mackerel as wanted into a "culling crib," which is made about 3 feet wide and 4 feet long, with slat bottom, at each end of which stands an experienced and careful "culler," who tosses the mackerel according to their grade into "culling tubs," which hold a half-barrel each; two of the crew then place the tubs, when full, on the platform of a beam scale, where the "weigher" weighs them off, crying out "barrel of one's," or whatever the weight or grade requires; two of the crew empty them into the "packing cribs," while the master places the account of it under the name of the catcher, and the packer, with a piece of red chalk, marks the head of the barrel or whatever package is used with the grade of the mackerel. Half a bushel of salt to the barrel is used in packing, after which the cooper takes it, and after putting in the head it is rolled out on the wharf by a laborer and there bored and pickled off by the "pickler." After being pickled off and bunged they are stood upon their head and branded with the deputy inspector's name and the grade of the fish; the trip is sold by the owner with the master, he acting for himself and crew; the voyage is then made up in the ordinary manner. When the mackerel are delivered to the packer the vessel and crew are done with them as producers.

4.—THE MACKEREL GILL-NET FISHERY.

1. APPARATUS AND METHODS.

Considerable quantities of mackerel are sometimes caught in gill-nets at various points along the New England coast, from Vineyard Sound to Eastport. For the most part, however, they are taken west of Mount Desert. This fishery is carried on in two ways: The gill-nets may be anchored and left out over night, as is the custom about Provincetown, or they may be set from a boat or vessel. The latter method is called "dragging"; the vessels are called "draggers," or "drag-boats," and the fishermen "mackerel draggers."

The mackerel gill-nets are 20 to 30 fathoms long, 2½ fathoms deep, with a mesh varying from 2½ to 3 inches. In Provincetown Harbor they are set in the following manner:

About the middle of November the fishermen of Provincetown Bay begin to put out nets for

the large mackerel on its return. On one occasion Captain Atwood had twelve nets out, 5 miles from land. On the last night of November he had taken nothing, but on visiting the nets the next day he found they had sunk to the bottom filled with mackerel. He, however, succeeded in getting up eight, and the nets as they came to the surface looked like a sheet of silver. Three thousand three hundred and sixty mackerel were taken from these eight nets by nightfall. The next day the remaining nets were dragged in and 1,700 more taken, making 5,000 fish netted at a single catch. On another occasion a catch lasted three nights, when he alone caught mackerel enough of the best quality to make 16 barrels when packed.*

In Gloucester Harbor and at other points on the coast of Massachusetts and Maine they are set in shallow water, one or both ends being anchored and their position marked by buoys on each end of the gang. When set thus in protected harbors they are ordinarily placed across the direction of the tide, usually in a cove or bight of the harbor where the mackerel are known to occur, and where they are out of the track of vessels.

The most extensive "drag net fishery" is carried on by the vessels of Portland and Friendship, Me. The method employed by these fishermen six years ago was somewhat as follows: The vessels are small schooners of 15 to 25 tons. They usually run out from the harbor near the close of the day, timing their departure so that they will be upon the fishing grounds about sunset, except when it is necessary to go a long distance out to sea, in which case, of course, the time of starting is earlier. Reaching a locality where mackerel are supposed to be abundant the vessel is hove to, and a gang of ten to twenty nets is paid out. The nets are fastened together at top and bottom, and the outer end is marked by a buoy, other buoys being distributed along the gang at intervals, the junction between each pair of nets being generally marked by a keg or spar. To the last net is fastened a rope called a "net swing," corresponding to the "fleeth-rope" used by the herring fishermen of Europe. This is a rope of 3 inches in circumference and 60 to 70 fathoms long. It is paid out to its full length and made fast at the bow of the vessel. The foresail is then lowered and furled, and the vessel lies head to the wind, drifting to leeward and dragging the nets as she goes. If the wind is moderate the whole mainsail is kept up, but if the breeze is fresh, or what is called a mackerel breeze, it is reefed. Under favorable circumstances the nets are allowed to remain out all night, but the fishermen in the two dories row constantly along the nets back and forth noticing the movements of the fish, and especially looking out for the approach of dogfish. When a school of dogfish approaches the nets after any number of mackerel have been gilled it is at once necessary to take them in less the dogfish should devour the mackerel, tear innumerable holes in the twine, and roll themselves up in it until it is so twisted and tangled that it takes the labor of days to get it in proper condition for setting again. If the fishermen are not annoyed by dogfish the nets are allowed to remain down, as has been stated, all night long, and the men in the dories constantly pick out the fish, frequently carrying their catch back to the vessel. When the dogfish attack the nets they haul them in with the utmost expedition and bundle them as hurriedly as possible into the bottom of the dory, and after they have lifted them to the deck of the vessel take out the fish from among the meshes.

It is part of the duty of the men in the dories to keep a vigilant lookout for approaching vessels. The gang of nets may be more than half a mile in length, and the keel of a large vessel passing over it would be almost certain to cut it in two. When it is still weather they row toward any vessel which they may see coming and ask the men on watch to steer clear of the nets; otherwise they are obliged to stand by the nets and repair the damages as best they may. Sometimes the approaching vessels are induced to steer clear of the nets by the dorymen, who hold up a lan-

* Captain Atwood, Proc. Bos. Soc. Nat. Hist., x, 1865–'66.

tern for that purpose. The mackerel caught in this manner are always carried fresh to the shore, and are intended chiefly for the supply of the markets of the large cities. They are packed in barrels, and may or may not be gibbed through the gills before reaching shore. A vessel setting a long string of nets may catch as much as 50 barrels of mackerel in a night, but ordinarily not more than 5 or 10 barrels, frequently less. The barrels are carried on deck, and the fish are put in them as soon as they are removed from the nets. When the weather is warm the barrels are filled with ice-water. Besides the mackerel caught, considerable quantities of shad and alewives are taken in these nets. On an excursion made by one of the authors from Portland in 1873, besides 6 barrels of mackerel there were caught with a small string of nets about 40 fine shad, averaging 2 pounds each, and 300 or 400 of that species of alewives known to the Portland fishermen by the names of "kyack," "cat-thresher," "saw-belly," or "blue-back," probably identical with the glut-herring (*Clupea æstivalis*) of the Chesapeake basin, the summer alewives occasionally taken in New England rivers. On this occasion the mackerel were feeding extensively on various entomostraca, with which the water was filled, and which imparted to it a vivid phosphorescence all night long. The presence of these animals, and of others more minute, causes the water and the nets to "fire" in such a manner as often to render them so visible to the fish that they successfully avoid contact with the twine.

The mackerel caught at Provincetown in gill-nets are brought in by the boats, and shipped by the fishermen to Boston in vessels devoted specially to this business, the owners of which receive a percentage upon the amount of their sales.

The crew of a Maine mackerel-dragger consists generally of two to four men, the vessels being usually owned by the fishermen.

2. HISTORY OF MACKEREL GILL-NETTING.

The custom of dragging for mackerel, though practiced for centuries in Europe,* appears to have been first used in this country at Provincetown about the year 1841, where it is still prosecuted to a considerable extent in addition to the stationary gill-net fishery which has been

* For convenience of comparison the following description of drift-net fishing for mackerel on the coast of England is quoted from Yarrell's British Fishes:

"The most common mode of fishing for mackerel, and the way in which the greatest numbers are taken, is by drift-nets. The drift-net is 20 feet deep by 120 feet long; well corked at the top, but without lead at the bottom. They are made of small fine twine, which is tanned of a reddish brown color to preserve it from the action of the salt water, and it is thereby rendered much more durable.

"The size of the mesh is about 2½ inches, or rather larger. Twelve, fifteen, and sometimes eighteen of these nets are attached lengthways by tying along a thick rope, called the drift-rope, and the ends of each net to each other. When arranged for depositing in the sea, a large buoy attached to the end of the drift rope is thrown overboard, the vessel is put before the wind, and, as she sails along, the rope with the nets thus attached is passed over the stern into the water till the whole of the nets are thus thrown out. The nets thus deposited hang suspended in the water perpendicularly, 20 feet deep from the drift-rope and extending from three-quarters of a mile to a mile, or even a mile and a half, depending on the number of nets belonging to the party or company engaged in fishing together. When the whole of the nets are thus handed out, the drift-rope is shifted from the stern to the bow of the vessel, and she rides by it as at anchor. The benefit gained by the boats hanging at the end of the drift-rope is that the net is kept strained in a straight line, which, without this pull upon it, would not be the case. The nets are 'shot' in the evening, and sometimes hauled once during the night; at others, allowed to remain in the water all night. The fish roving in the dark through the water hang in the meshes of the nets, which are large enough to admit them beyond the gill-covers and pectoral fins, but not large enough to allow the thickest part of the body to pass through. In the morning early preparations are made for hauling the nets. A capstan on the deck is manned, about which two turns of drift-rope are taken; one man stands forward to untie the upper edge of each net from the drift-rope, which is called casting off the lashings; others haul the net in with the fish caught, to which one side of the vessel is devoted; the other side is occupied with the drift-rope, which is wound in by the men at the capstan." (The History of British Fishes, first edition, 1836, vol. 1, pp. 126, 127.)

mentioned.* At first small open boats were used, such as the one described and figured in the another part of this report under the name of "Provincetown drag-boat." About 1845, Provincetown fishermen with their boats and nets essayed dragging for mackerel in the vicinity of Monhegan, Me., and by their example this practice was introduced into Maine, and since that time it has been carried on at various points on the coast. In 1873 twelve or fifteen vessels from 15 to 25 tons each were employed at Portland; at present the number at this port is eighteen, and quite a fleet of the mackerel-draggers also belongs to the vicinity of Friendship, Me.†

Along the southern coast of Nova Scotia, and about the vicinity of the Straits of Canso, there is an extensive gill-net fishery for mackerel carried on with stationary nets, and, in a smaller degree, a similar fishery is prosecuted in some parts of the Gulf of Saint Lawrence.‡ This fishery on the Nova Scotia coast is prosecuted when the mackerel are traversing the coast line in the spring and fall.

"During the mackerel fishing season," remarks Mr. J. Matthew Jones, "the people along shore appear to live in a state of much excitement, expecting every hour the 'runs' to come into their bays. The traveler who may desire a horse and wagon to get on from place to place will find hard work to prevail upon the people to hire one out to him with a driver. Lookouts are kept on some elevated spot so that the schools may be seen some distance off, in order to give time for the fishermen to get off in their boats with the net." As at Provincetown, these nets are anchored only at one end, the other end being left free to swing with the current. They are sometimes set as far as 10 or 12 miles from the shore, in water 20 to 50 fathoms in depth, care being taken to put them as nearly as possible in those localities which are known to lie in the "track" of the mackerel.

The mackerel gill-nets are usually set with their upper lines close to the surface; sometimes, however, as much as 2 or 3 fathoms below. The position of the net in the water is regulated by the length of the buoy-ropes and the weight of the sinkers. As a rule, especially on the coast of Nova Scotia, they are, however, set close to the surface.

In this region, also, there has been for many years an extensive seine fishery for mackerel, corresponding to that which is elsewhere referred to as having been formerly carried on, two hundred and fifty years ago, on the shores of Cape Cod Bay. The principal points for the seine fishery are at Margaret's Bay, west of Halifax, and at Chedabucto Bay, at the eastern part of Nova Scotia.

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* Capt. N. E. Atwood, at Provincetown, writes as follows in regard to the introduction of the method of dragging for mackerel at Cape Cod: "As early as I can recollect most of the mackerel taken along our coast were caught with hook and line. A few gill-nets were set at moorings in our harbor and along the Truro shore during the first part of the mackerel season, or as soon as the fish came in. The mackerel which were then taken in nets were sent to Boston market and sold fresh, sometimes bringing good prices. As the mackerel would not bite at the hook when they first struck in, we would often get two weeks' fishing before a sufficient quantity of mackerel were caught on the hook to glut the market. Boston market being at that time small and no ice used in packing, only a few fresh fish could be sold there at any one time.

"In 1841 I went to Monomoy Bay (Chatham) to fish for shad; we went out in the bay and put out our gill-nets and drifted with them all night if the weather would permit that mode of fishing, which we then and have always since called 'dragging.' On my return home to engage in the mackerel net fishery, very few had been caught in nets in our harbor, but large schools of mackerel had been passing in by Race Point and Wood End, and were going up the bay. I took my mackerel nets in the boat and went out in the bay toward Plymouth, some 2 or 3 miles, and put them out and drifted all night; next morning I found I had a good catch. This occurrence took place about the 15th of June, 1841.

"It did not take the other fishermen long to get into this new way of fishing, and since that time this method of drag-fishing has been adopted along the coast of Maine and elsewhere."

† Friendship has twelve vessels, Cushing five, Waldoboro' two, and Booth Bay and Bremen one each; the total from Maine, including those from Portland, being thirty-nine; the tonnage is 559.47; number of men, one hundred and thirty-three.

‡ Schooner Yankee Lass, of Boston, arrived home last week from a season's mackereling trip around the Seven Islands of Saint Lawrence River, with 300 barrels, all large No. 1 mackerel, taken in [gill] nets. (Cape Ann Advertiser, September 30, 1881.)

Perley, writing in 1852, remarked: "In those harbors of Nova Scotia which are within the Straits of Canso mackerel have of late years been taken in seines capable of inclosing and securing 800 barrels, and in these seines 400 and even 600 barrels have been taken in a single sweep."*

In the same locality Perley refers to the use of the drift-nets, undoubtedly meaning the set gill-net just described, remarking, however, that this mode of fishing is probably not so well understood on the coast of Nova Scotia as in England. He however quotes from Yarrell an account of drift-net fishing in England, which is altogether different from that used in Nova Scotia, and corresponds precisely with the drag-net fishing also described in the beginning of this chapter.

It is worthy of mention that mackerel as well as herring, on the coast of Europe at the present time, are almost exclusively caught by the use of the drag-net, the only other method in use being the equally old-fashioned one of "drailing," which was abandoned by our fishermen sixty-five years ago.* The antiquated method of drailing was, however, kept up by the fishermen of the Gulf of Saint Lawrence until 1860, or perhaps even to the present time, for the purpose of obtaining mackerel for bait to be used in the cod fisheries.

5.—THE EARLY METHODS OF THE MACKEREL FISHERY (1620 TO 1820).

1. CATCHING MACKEREL WITH DRAG-SEINES.

The method chiefly practiced by the colonists of New England for the capture of mackerel was that of drag-seining, and we find as early as 1626 a record of the establishment, by Isaac Allerton, of a fishing station at Hull, where mackerel were seined by moonlight. There can be little doubt that the practice of fishing with baited hooks was also early introduced, and that in the seventeenth and eighteenth centuries groups of boats might have been seen, as at the present day, clustered together in the harbors or near the outer shores, their crews busily engaged in hauling in the tinkers, and, occasionally, larger mackerel which, during the summer season, found their way into these protected waters. It is not known when the custom of drailing for mackerel was first introduced, but it was beyond question the common method at the close of the last and the beginning of the present century.

In July, 1677, the records of the Plymouth colony show that the Cape Cod fishery was let seven years, at £30 per annum, to seine mackerel and bass, to certain individuals who are named. They were restricted to take in the Plymouth colonists with them; and, if none offer, to admit strangers. The profits of the hire which accrued to the colony were sometimes distributed to the schools.

A writer in the Massachusetts Historical Society's Collections gives the following description of these fisheries (vol. iv, 2d series, p. 232): "The aboriginal name of this fish (the mackerel) is Wawunnebeseag, a plural term signifying fatness—a very descriptive and appropriate name. The mode of taking these fish is while the vessel is under quick way and the helm secured, when all are engaged at the long, veered lines, of which it is said that one man will attend three, and it may be more. The first manner of taking mackerel was by seining by moonlight. This perhaps was first

* Fisheries of New Brunswick, 1852, pp. 13-16.

† Though drailing was abandoned so long ago by the professional mackerel fishermen of New England, we are, nevertheless, told by Capt. Joseph Smith, of Gloucester, that this method of fishing is still practiced by the Block Island boat fishermen.

practiced by Mr. Isaac Allerton and his fishing company at Hull as early as 1626. After half a century the mode of fishing was changed to that of drailing with long lines while the vessel was under easy way; and this mode has been changed within these last twenty years (1811–1831). The mode of fishing generally practiced now is to invite the fish around the vessel while lying to by throwing out great quantities of fish cut in small pieces, and to take them with short lines held in the hand and drawn in with a single motion of the arm. By this method it is thought that thrice as many fish may be taken in a given time as by any other method. They are a capricious and sportive fish. In cloudy and even wet weather they take the hook with most avidity. They are very partial to the color of red; hence a rag of that hue is sometimes a bait. A small strip of their own flesh taken from near the tail is used with most success."

Seining mackerel with drag-seines is still practiced extensively in the British Provinces. That the practice was in vogue in Massachusetts less than fifty years ago is shown by the following item from the Gloucester Telegraph of June 30, 1838:

"Last week twenty barrels of mackerel were seined at one haul at Sandy Point by Captain Baker. His seine is 500 yards long. A few weeks ago he inclosed a multitude of fishes, principally menhaden shad. It is estimated that their number was 200,000."

In his History of Scituate, pp. 25–27, Samuel Deane writes: "In early times the shores of our bays were skirted with forest trees quite near to the water's edge. In the month of June, when all nature is in bloom, the volatile farina of the forest trees then floats in the air, and occasionally settles on the smooth surface of the seas. Then it is that this playful fish, attracted by this phenomenon, leaps and bounds above the surface of the water. So again at a later season, in July and August, winged insects, carried away by the southwest winds, settle and rest on the bosom of the ocean, a welcome herald, it is said, to the mackerel catcher. Such are the habits of many fishes, and hence the use of the fly as a bait by the angler of the trout streams."

Douglas, in 1747, says: "Mackerel, split, salted, and barreled, for the negroes in the sugar islands are caught either by hook, seines, or meshes. Those by hook are the best; those by seines are worst, because in bulk they are bruised. Mackerel will not take the hook unless it have a motion of two or three knots. If quicker, they will take the hook, but their jaw, being tender, gives way, and the mackerel is lost. There are two seasons of mackerel—spring and autumn. The autumn mackerel are the best. Those of the spring appear about the middle of May, very lean, and vanish in two or three weeks."

2. DRAILING FOR MACKEREL.

Captain Atwood writes: "In my boyhood, when I caught my first mackerel, nobody thought of jigging them. We then took them in the same way as bluefish are caught. My first experience in mackerel fishing took place, when I was a little boy, about 1815. I went out with two old men. One of them fished in the stern of the boat, and when it did not sail fast enough the other and myself—I was eight years old at the time—had to row, in order, by the more rapid motion of the boat, to induce the fish to bite. They would not bite unless the line was towed. Two great long poles were run out, one just forward, in such a manner that our vessel had the appearance of a long-armed spider. The poles were straight, and one line was fastened at one part and another line on the end of the pole, in order to have them separated. This style of fishing continued until about the time when I began to go to sea, about 1820. Jigging for mackerel then commenced, bait being thrown overboard, and the fish being thus attracted alongside of the vessel, and this soon came into general use."

Capt. James Turner, of Isle au Haut, Maine, who assures us that as late as 1815 the fishermen drailed for mackerel, gives the following account of this method of fishing:

"While drailing, the sails were trimmed in such a manner that, when the helm was partly down, the vessel would 'jog' along slowly, making a little leeward drift, so that the lines would trend off at a slight angle from the weather side. Each man had one line, the end of which was attached to the end of a pole that was fastened to the vessel's rail, projecting out about 8 feet at right angles with the side of the vessel. The fisherman held in his hand a hauling-line, which was attached to the middle of the one fastened to the pole, so that he might know when a fish took the hook and be able to haul it in.

"About a pound of sheet lead was wound around the line, a foot above the hook. When the vessel was engaged in fishing, the man standing forward threw over a small amount of fine bait (which had previously been chopped with hatchets) occasionally, scattering it along in order to attract the fish and keep them near the vessel."

The following paragraphs are quoted from an essay in the *Fishermen's Memorial and Record Book*:

"Trailing was one of the means used to catch mackerel in the olden time, and one of our old fishermen informs us that when a lad he distinctly remembers of being out in Boston Bay one day in a boat with his father, when he saw a vessel which looked very strangely to his young eyes, and, boy-like, he asked his father what sort of craft it was.

"'That's a trailer, my boy, and we'll speak with him,' was the reply.

"They sailed quite near, and they observed that the vessel had outriggers of long poles on each side, commencing forward at about seventeen feet and tapering off to five feet aft. At the ends lines were fastened, about twenty fathoms long, with a sinker of four pounds, and hook below. To each of these lines was attached a bridle, reaching to the side of the vessel, where the fishermen stood to feel the bites. This particular vessel was from Hingham, and had been out four weeks without receiving even a bite, and the skipper said he was going to give it up and go home.

"The present mode of catching mackerel by drifting and tolling with bait did not come into general use until after 1812. The gear for catching previous to that was a white hempen bob-line, as it was called, and the style of fishing was termed 'bobbing' mackerel. These lines were some seven fathoms in length, with a leaden sinker two inches long, and shaped like a thin pea-pod. At one end was a gauging about a foot long for the hook. Every few minutes off would go the hook, and extra hooks were always in readiness to replace those lost. This mode continued until the year 1816, when Abraham Lurvey, of Pigeon Cove, discovered a method of running lead around the hooks, and which were afterward called jigs. This he kept secret for many months. The hooks then in use were nearly as large as the haddock hooks of to-day. The small lines and fly-lines did not come into use until about 1823. About this time the gaff was introduced, and was abandoned after being used some ten years."*

It seems scarcely necessary to discuss more in detail the methods used during the first two centuries of the mackerel fishery of North America. In the Report of the U. S. Fish Commission for 1881 there is given a chronological history of the mackerel fishery from its inception to the present time.

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* *The mackerel gaff was used to some extent, by the hook and line fishermen, as late as 1865, and possibly even since that time.*

6.—LEGISLATION FOR THE PROTECTION OF MACKEREL.

1. LEGISLATION IN THE SEVENTEENTH AND EIGHTEENTH CENTURIES.

At an early day in the history of the United States a failure of the mackerel fishery was apprehended. The following notices of legislation, copies of laws, and newspaper extracts will serve to give an idea of the state of public opinion at different periods from 1660 to the present time:

1660.—*Early regulation of the mackerel fishery.*—"The commissioners of the United Colonies recommended to the several General Courts to regulate the mackerel fishery; conceiving *that* fish to be the most staple commodity of the country. Few who have not investigated the subject have at the present day an adequate conception of the importance of this branch of productive industry."*

1670.—*Prohibition of early mackerel fishing by laws of Plymouth Colony.*—"Wheras wee haue formerly seen Great Inconvenience of taking mackerell att vnseasonable times wherby there encrease is greatly deminished and that it hath bine proposed to the Court of the Massachusetts that some course might be taken for preventing the same and that they have lately drawne vp an order about the same this Court doth enacte and order that henceforth noe makerell shalbe caught except for spending while fresh before the first of July Annually on penaltie of the losse of the same the one halfe to the Informer and the other halfe to the vse of the Collonie; and this order to take place from the 20th of this Instant June."†

1684.—*Prohibition of mackerel seining.*—"In 1680, Cornet Robert Stetson, of Scituate, and Nathaniel Thomas, of Marshfield, hired the Cape fishery for bass and mackerel. In 1684, the court enacted a law 'prohibiting the seining of mackerel in any part of the colony'; and the same year leased the Cape fishery for bass and mackerel to Mr. William Clark for seven years, at £30 per annum.

"Subsequently to 1700 it is certain that the mackerel were very abundant in Massachusetts Bay. It was not uncommon for a vessel to take a thousand barrels in a season. The packing, as it is called, was chiefly done at Boston and Plymouth."‡

1692.—*Repeal of prohibitory laws in Massachusetts.*—"And be it further enacted and declared, That the clause in the act, entituled 'An Act for the Regulating and Encouragement of Fishery', that henceforth no mackeril shall be caught (except for spending whilst fresh), before the first of July annually, be and hereby is fully repealed and made void, anything therein to the contrary notwithstanding. [Passed February 8, 1692–'3.]"§

1692.—AN ACT for the regulating and encouragement of fishery.

"Upon consideration of great damage and scandal, that hath happened upon the account of pickled fish, although afterwards dried and hardly discoverable, to the great loss of many, and also an ill reputation on this province, and the fishery of it—

"*Be it therefore enacted by the Governor, Council and Representatives, convened in General Court or Assembly, and it is enacted by the authority of the same,*

"[SECT. 1.] That no person or persons whatsoever, after the publication hereof, shall save or

* Freeman's Hist. of Cape Cod, Boston, 1862, vol. i, p. 239.
† Plymouth Colony Records, vol. xi, 1623–1682 Laws, p. 228.
‡ Deane's History of Scituate, Mass.
§ *Acts and Resolves of the Province of Massachusetts Bay, vol. i, 1692–1714, p. 102.*

salt any sort of fish (that is intended to be dried) in cask or fattes, or any other way than what hath formerly and honestly been practised for the making of dry fish, on penalty of forfeiting all such fish so salted and pickled, whether it be green or drye; the one moiety thereof to the use of the poor of the town where the offence is committed, and the other moiety to the person that shall sue for the same.

"And it is further enacted by the authority aforesaid,

"[SECT. 2.] That henceforth no mackrel shall be caught (except for spending whilst fresh) before the first of July annually; and no person or persons whatsoever, after the publication hereof, shall at any time or place within this province take, kill, or hale ashore any mackrel, with any sort[s] of nets or sa'ens whatsoever, on penalty of forfeiting all such mackrel so taken or haled ashore, and also all such nets or sa'ens which were so imployed; the one-half thereof to their majesties towards the support of this their government, and the other half to him or them that shall inform and sue for the same. And all justices are hereby impowered, and required to grant their warrants for the seizing of the same and the aforesaid forfeitures, or the receiving of the like value in current money of this province. [Passed November 26, 1692.]"*

1702.—*Re-enactment of prohibitory laws.*

"AN ACT for the reviving and re-enacting a clause in the act intituled 'An act for the regulating and encouragement of fishery' that hath been for some time repealed by the General Assembly.

"Whereas, in the second paragraph of the said act it is enacted 'that henceforth no mackerel shall be caught (except for spending whilst fresh) before the first of July annually'; and whereas the said clause, by an act afterwards made and passed by the general assembly [1692–3 Feb. 8.], was repealed and made void, which said repeal and the unseasonable catching of mack[a]rel thereupon hath been experienced to be very prejudicial to this province,—Be it therefore enacted by His Excellency the Governour, Council and Representatives [convened] in General Court or Assembly, and it is enacted by the authority of the same, That the said clause above-recited shall be and is hereby revived and re-enacted, and that henceforth no person or persons whatsoever shall presume to catch or cause to be caught any mack[a]rel, (except for spending whilst fresh,) before the first of July annually, on penalty of forfeiting all the mack[a]rel so caught contrary to the true intent and meaning of this act, and twenty shillings per barrel over and above for each barrel of the same; the one-half of the said forfeiture to be to her majesty for and towards the support of this her government, and the other half to him or them that shall inform and sue for the same in any of her majesty's courts of record within this province. [Passed November 11, 1702; signed by the Governor and published November 21, 1702.]"†

2. PROTESTS AGAINST GIGGING AND SEINING IN THE PRESENT CENTURY.

1838–9.—*Protests against gigging.*—"The Boston Journal protests strongly against the barbarous method of taking mackerel called 'gigging,'‡ and urges that it is not only liable to censure on the score of humanity, but it is also *impolitic*, and that if this destructive method of fishing is generally continued a few years longer it will break up the fishery. We have for a year or two past entertained a similar opinion, and probably the complaints now so frequently made by the fishermen that, though mackerel are plenty, they 'will not bite,' is owing to the custom of 'gigging.'

* Acts and Resolves of the Province of Massachusetts Bay. Vol. 1, 1692-1714, p. 71. Province Laws, 1692–3. Chap. XXXII.

† *Ibid.*, p. 507.

‡ The method of capture called "gigging" here is undoubtedly gaffing, since a fish-gaff is even yet called a "gig" by some of our fishermen.

There is hardly anything which possesses life that has so little instinct as not to become very shy under such barbarous inflictions. It is obvious that all which are hooked in this manner are not taken on board; the gig frequently tears out, and thousands, millions of these fish are lacerated by these large hooks and afterwards die in the water."*

The following protest appeared in the Gloucester Telegraph, Wednesday, August 7, 1839, it being a quotation from the Salem Register:

"All the mackerel men who arrive report the scarcity of this fish, and at the same time I notice an improvement in taking them with nets at Cape Cod and other places. If this speculation is allowed to go on without being checked or regulated by the government, will not these fish be as scarce on the coast as penguins are, which were so plenty before the Revolutionary war that our fishermen could take them with their gaffs? But during the war some mercenary and cruel individuals used to visit the islands on the eastern shore where were the haunts of these birds for breeding, and take them for the sake of the fat, which they procured, and then let the birds go. This proceeding finally destroyed the whole race. It is many years since I have seen or heard one except on the coast of Cape Horn. In 1692 the General Court passed an act prohibiting the taking of mackerel before the first day of July annually, under penalty of forfeiting the fish so taken. In 1702 this act was revived with additional penalties—besides forfeiting the fish and apparatus for taking, 20 shillings per barrel, and none to be taken with seines or nets.

"A FISHERMAN.

"MARBLEHEAD, *August* 3, 1839."

1859.—*Protests against the use of seines.*—"A petition is now before the committee on fisheries, in the House, to abolish the catching of mackerel in seines on our coast. As mackerel can now be caught only in this way, and many of our people are interested in this business, it becomes highly important that any such stupid petition should be prostrated at once. Mr. Gifford has asked for a delay in the petition, and Mr. Atwood has written to show the nature of the business upon our coast. One thing is certain, if we do not take the mackerel in seines or nets we shall get none at all." †

1870–1882.—*Opposition to the purse-seine.*—Since the general adoption of the purse-seine no year has passed without a considerable amount of friction between fishermen using this engine of wholesale destruction in the capture of mackerel and menhaden and those engaged in fishing with other forms of apparatus. Petitions to Congress and State legislatures have been made from both sides, and in some instances laws have been passed by State legislatures prohibiting the use of menhaden seines within certain specified tracts of water, such as the Chesapeake Bay. These laws, while especially antagonistic to menhaden fishing, were aimed chiefly at the purse-seine as a means of capture, and would doubtless have been equally prohibitory of mackerel fishing with purse-seines had this been attempted within the limits. In 1878 a delegation of fishermen from Portland, Me., and Gloucester, Mass., visited Washington for the purpose of securing the passage of a law prohibiting the use of purse-seines in the mackerel fishery. In 1882 the clamors of shore fishermen, especially on the coast of New Jersey, led to the appointment of a committee of the United States Senate, which took considerable testimony regarding the effect of the purse-seine upon the menhaden fishery, and incidentally upon other fisheries of the coast. The labors of this committee will probably result in the recommendation of some form of legislation which will apply, in part at least, to the mackerel fishery.

In the summer of 1882 a serious commotion was caused among the mackerel fishermen by the

* Newburyport Herald, Gloucester Telegraph, September 23, 1838.

† Provincetown Banner, February, 1859.

announcement of the intention of a number of menhaden fishermen to employ their steamers and nets in the mackerel fishery. It was the impression among these men that the mackerel were to be used for the manufacture of oil and guano, but this has been denied by Capt. David T. Church and other representative men, who, reasonably enough, state that they could not afford to use so valuable a fish for this purpose, and who claim that they have an undoubted right to use their steamers in the capture of mackerel for sale fresh in the markets and for pickling.

As a matter of record we reproduce the following paragraphs from an editorial in the Cape Ann Advertiser, July 14, 1882:

"It is not a difficult matter to anticipate the result if this class of steamers engage in this branch of the fisheries. There is no reason to doubt their ability to catch almost or quite as many mackerel as they have formerly caught menhaden. Several of them are large, capable of carrying 2,800 barrels of fish in bulk. These carry a double gang of men, and apparatus to correspond. During moderate weather, when mackerel generally school the best, and sailing vessels find it difficult to move, these steamers can play around the fleet of schooners, catch almost every fish that shows itself, and carry them away to be used, not for food-fish as they were intended, but for oil and guano, to enrich a few men at the expense of many.

"If the steamers were to engage in the mackerel fishery, selling their catch for food, and were obliged to spend the requisite time for dressing them, which would debar them from an overcatch and carrying them to market, thus placing them on somewhat equal footing with the other fishermen, there could be no reasonable objection to their employment; but it certainly seems, in view of this startling innovation, that some decided action should be taken by 'the powers that be' to prevent the catch of mackerel for the purpose of manufacturing oil and guano. They are altogether too valuable for such a purpose, and the risk of breaking up the schools and driving them almost entirely from our waters, as has been the case with menhaden, is altogether too great.

"Unless some action is taken, and taken at once, and stringent laws enacted, we may confidently look forward to the destruction in a few years of one of the important industries of New England and the permanent and serious injury of large communities which now derive a considerable part of their support from the mackerel fishery."

7.—STATISTICS OF THE MACKEREL FISHERY.

1. STATISTICS OF THE FISHING FLEET AND PRODUCTS OF THE FISHERY IN 1880.

By R. E. Earll.

From the earliest settlement of the country the mackerel fisheries have been extensively prosecuted by a large number of people living along the New England coast, as well as by many of the inhabitants of the British Provinces. The catch has varied greatly from time to time, and seasons of extreme plenty have often been followed by those of remarkable scarcity. Various theories have been advanced to account for this fluctuation. Many have been inclined to attribute it to overfishing, or to the apparatus employed in the fishery, while others claim that the movements of the fish are affected by natural causes, such as temperature, currents, the presence or absence of food, and the like, over which man has little or no control. Whatever the causes that influence the movements of the fish the fact of great variation in the abundance of the species from time to time remains.

In 1864, according to the returns of the various fish inspectors, 8,079 barrels of mackerel were

packed in Massachusetts, while in 1814 only 1,349 barrels were put up. In 1831 the quantity was increased to 383,658, this being the largest amount ever inspected in the State. A period of scarcity followed, and between 1839 and 1845 the inspection returns show an average of only 67,674 barrels annually. About 1860 the fish were again abundant, and for eight years the quantity packed averaged 246,877 barrels. This period of plenty was in turn followed by one of scarcity, which culminated in 1877, at which time only 105,017 barrels were inspected, and the fishery was practically a failure, resulting in great loss both to fishermen and capitalists. Fortunately this condition of affairs is at an end, and the fishery is again in a prosperous condition, the catch of the New England fishermen at present, if we include the fish sold fresh, being larger than at any time since the origin of the fishery.

In 1880 the New England mackerel fishermen met with marked success, though those of the British Provinces were not so fortunate. By the middle of March a number of the Maine and Massachusetts vessels sailed for the South to engage in the spring fishery, and by the 20th of the following month the last of the fleet, which consisted of sixty-four sail, averaging 65.66 tons each, were under way. The season opened with a haul of 25,000 mackerel taken off the Virginia capes on the 2d of April. These were carried to New York, where they met with a ready sale at good figures. From that time mackerel were taken frequently, the fleet working northward with the fish as the season advanced, reaching Long Island about the last of April, and Cape Cod a few weeks later. The season was not a very satisfactory one for the Southern fleet, as the catch was small, and the fish were of poor quality, a majority of the vessels engaged making comparatively light stocks while many of them scarcely paid expenses. As the summer approached, the fishing improved greatly, the fish increasing both in number and quality, and the Southern fleet was joined by a large number of vessels from the various fishing ports. Later, as the vessels arrived from their trips to the codfish banks, many were fitted out to engage in the mackerel fishery, and by the 1st of August the fishing was at its height, the fleet numbering four hundred and sixty-eight sail, averaging a trifle over 50 tons apiece. Of this number three hundred and forty-three were provided with purse-seines for engaging in the off-shore fisheries, while one hundred and twenty-five fished with hook or net chiefly on the in-shore grounds. The value of this fleet, including the fishing gear and outfits, reached $2,122,360, and five thousand and forty-three men were employed. A little later in the season about twenty-five of the vessels proceeded to the Gulf of Saint Lawrence in the hope of meeting with better success; but few fish were seen, and the venture resulted disastrously to a large majority of them, many failing to pay expenses, while a few returned without having caught a fish. These vessels on their return at once joined the home fleet, and, meeting with good success, most of them were enabled to make good the loss which they had previously sustained.

About the 1st of July an unprecedentedly large body of mackerel entered the Gulf of Maine, many of them visiting the shore-waters, entering the various harbors and coves, where they remained for some weeks. During their stay in these in-shore waters thousands of men and boys engaged in their capture from small boats, and in many localities a majority of the male population participated in the fishery to a greater or less extent. The pound-nets along the southern coast of New England were peculiarly successful, while large quantities were taken in the traps and weirs between Cape Cod and Penobscot Bay. Probably not less than 10,000 people along various portions of the coast of Maine were engaged in mackerel hooking during some portion of the season, though many of them fished chiefly for pleasure, while others caught only limited quantities for home supply. About 3,500 followed the business regularly for some time, many of them realizing considerable profit from the work. In Massachusetts a similar condition of affairs

existed, and thousands of persons engaged in the fishery from small boats to a greater or less extent, fully 2,000 fishing extensively for profit.

Most of the fish taken by both the vessel and boat fishermen were of uniform size and of excellent quality. Few extremely large ones were secured, while there was also a notable absence of "tinkers." Over two-thirds of the catch were branded as "twos," many of them going as "extras." During the season, which lasted till the 1st of December, nearly 132,000,000 pounds of mackerel were taken. Of this quantity the Massachusetts fishermen caught 95,000,000 pounds, and those of Maine secured 31,000,000 pounds, the bulk of the remainder being taken by the citizens of New Hampshire and Connecticut. Over 75 per cent. of the entire catch was salted, about 22,000,000 pounds were sold fresh for food, nearly 5,000,000 pounds were used for canning, and the rest were sold for bait or for fertilizing purposes. The value of the catch, as placed upon the market, was $2,606,534.

A.—*Table showing the number of vessels and men employed in the mackerel fishery.*

Ports.	Total.					Vessels engaged in the mackerel fishery only.					Vessels engaged in the mackerel and other fisheries.				
	Vessels.	Tonnage.	Value.	Value of gear and outfit.	Men.	Vessels.	Tonnage.	Value.	Value of gear and outfit.	Men.	Vessels.	Tonnage.	Value.	Value of gear and outfit.	Men.
Grand total	468	23,551.64	$1,027,010	$1,094,450	5,043	235	15,489.49	$675,195	$699,900	3,134	233	8,062.15	$352,715	$394,550	1,909
MAINE.															
Eastport	*1	52.49	2,000	2,900	13	1	52.49	2,000	2,900	13					
Hancock	1	18.11	150	1,100	4						1	18.11	150	1,100	4
Tremont	2	41.79	130	2,200	14						2	41.79	130	2,200	14
Cranberry Island	4	178.43	8,200	8,000	45						4	178.43	8,200	8,000	45
Bluehill	1	10.50	250	650	3	1	10.50	250	650	3					
Brooklin	3	115.82	4,100	4,250	25	1	67.68	2,000	2,900	14	2	48.16	1,100	1,350	11
Deer Isle	18	454.01	12,485	19,150	105	5	262.61	8,900	12,000	54	13	191.40	3,585	7,150	51
Sedgwick	1	57.95	3,000	2,500	13	1	57.95	3,000	2,500	13					
Bucksport	1	11.43	600	800	4						1	11.43	600	800	4
Swan's Island	14	664.40	23,500	30,500	137	10	598.49	22,350	27,700	126	4	65.91	1,150	2,800	11
Isle au Haut	3	52.84	1,300	2,100	15						3	52.84	1,300	2,100	15
Belfast	3	66.73	1,000	2,300	17						3	66.73	1,000	2,300	17
Lincolnville	1	20.48	375	700	4						1	20.48	375	700	4
Camden	3	161.54	4,000	8,500	41	3	161.54	4,000	8,500	41					
North Haven	14	451.99	17,600	22,800	107	6	338.18	13,500	18,000	72	8	113.81	4,100	4,800	35
Vinal Haven	5	52.22	1,250	3,000	16						5	52.22	1,250	3,000	16
Rockland	1	30.84	6,000	2,000	11	1	30.84	6,000	2,000	11					
Saint George	3	85.45	4,150	4,000	26	1	41.58	2,000	2,200	11	2	53.87	2,150	2,400	15
Cushing	5	64.55	1,400	5,000	15	1	9.06	450	1,100	2	4	55.49	950	3,900	13
Friendship	13	217.02	7,625	17,000	41	1	14.16	1,500	2,500	2	12	203.46	6,125	14,500	39
Matinicus Island	4	90.64	3,650	5,150	26	1	43.96	1,600	2,000	10	3	46.68	2,250	3,150	16
Waldoboro'	2	29.59	350	2,100	5	1	12.84	200	1,050	2	1	16.75	150	1,050	3
Bremen	1	16.73	300	1,100	4						1	16.73	300	1,100	4
Bristol	6	86.25	2,950	5,850	25						6	86.25	2,950	5,850	25
Booth Bay	13	773.89	29,800	37,000	171	8	515.38	21,600	26,000	113	5	258.51	8,000	11,000	58
Southport	5	305.13	13,500	13,400	68	1	50.91	1,500	2,900	13	4	244.22	12,000	10,500	55
Wiscasset	1	53.59	800	2,800	12						1	53.59	800	2,800	12
Portland	46	1,940.56	83,000	98,100	434	18	1,105.98	45,000	55,500	229	28	834.58	38,000	42,600	205
Kennebunkport	1	6.88	250	600	2						1	6.88	250	600	2
Total	176	6,122.45	233,715	306,130	1,403	61	3,384.73	136,850	170,400	729	115	2,737.32	96,865	135,750	674
NEW HAMPSHIRE.															
Portsmouth	11	567.53	29,300	25,700	113	3	292.69	15,500	10,500	47	8	275.44	13,800	15,200	66

* This vessel, though owned at Eastport, is chartered and run by Portland capitalists, and therefore more properly belongs to the Portland fleet.

A.—Table showing the number of vessels and men employed in the mackerel fishery—Continued.

Ports.	Total.					Vessels engaged in the mackerel fishery only.					Vessels engaged in the mackerel and other fisheries.				
	Vessels.	Tonnage.	Value.	Value of gear and outfit.	Men.	Vessels.	Tonnage.	Value.	Value of gear and outfit.	Men.	Vessels.	Tonnage.	Value.	Value of gear and outfit.	Men.
MASSACHUSETTS.															
Newburyport	11	554.53	$94,150	$30,500	123	6	351.96	$11,650	$18,000	70	5	202.57	$12,500	$12,500	53
Essex	2	156.91	9,500	6,000	30	2	156.91	9,500	6,000	30					
Rockport	10	487.17	27,000	26,900	116	3	191.26	10,000	8,700	40	7	295.91	17,000	18,200	76
Gloucester	113	6,707.79	318,745	310,900	1,394	60	4,000.32	183,345	190,300	810	53	2,707.47	135,400	120,600	584
Salem	2	141.29	5,200	6,000	26	2	141.29	5,200	6,000	26					
Marblehead	3	107.13	8,300	7,800	31						3	107.13	8,300	7,800	31
Swampscott	12	559.85	30,400	31,200	142						12	559.85	30,400	31,200	142
Boston	25	1,612.28	50,700	73,400	336	17	1,267.77	41,350	54,400	245	8	344.51	9,350	19,000	91
Hingham	2	140.53	5,400	6,400	28	2	140.53	5,400	6,400	28					
Cohasset	6	443.56	22,000	19,200	86	6	443.56	22,000	19,200	86					
Duxbury	4	157.27	5,700	10,000	36						4	157.27	5,700	10,000	36
Wellfleet	34	2,569.55	109,450	102,900	470	34	2,569.55	109,450	102,900	470					
Truro	1	65.40	2,200	3,100	14	1	65.40	2,200	3,100	14					
Provincetown	5	343.19	13,600	15,000	74	5	343.19	13,600	15,000	74					
Orleans	2	150.80	7,000	6,200	29	2	150.80	7,000	6,200	29					
Chatham	6	421.77	22,900	18,400	89	5	376.83	19,800	16,000	79	1	44.94	3,100	2,400	10
Harwich	19	1,101.53	50,250	43,300	244	12	878.80	43,500	37,200	191	7	222.73	6,750	6,100	53
Dennis	18	755.24	30,500	31,200	185	12	547.42	24,850	22,800	132	6	207.82	5,650	8,400	53
Barnstable	3	142.56	5,400	6,400	28						3	142.56	5,400	6,400	28
Fair Haven	1	55.63	2,500	1,000	12						1	55.63	2,500	1,000	12
Total	279	16,673.98	750,895	755,800	3,493	169	11,625.59	508,845	512,200	2,324	110	5,048.39	242,050	243,600	1,169
CONNECTICUT.															
New London	2	187.68	14,000	6,800	34	2	187.68	14,000	6,800	34					

*B.—Table showing the mackerel fishing fleet of the United States, classified by States, according to fishing grounds.**

State.	Cape Hatteras to Gulf of Maine, inclusive.			Cape Hatteras to Gulf of Saint Lawrence, inclusive.			Block Island.		
	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.
Maine	20	1,288.70	264	3	215.67	41			
New Hampshire									
Massachusetts	38	2,513.02	528	3	178.43	41	12	201.82	59
Connecticut									
Total	58	3,801.72	792	6	394.10	82	12	201.82	59

State.	Gulf of Maine.			Gulf of Maine and Gulf of Saint Lawrence.			Gulf of Saint Lawrence.			Total.		
	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.
Maine	140	4,197.69	1,005	5	282.96	66	2	138.03	27	176	6,122.45	1,403
New Hampshire	11	567.53	113							11	567.53	113
Massachusetts	196	11,195.60	2,356	24	1,580.59	308	16	1,094.52	201	279	16,673.98	3,493
Connecticut				2	187.68	34				2	187.68	34
Total	343	15,960.22	3,474	31	2,051.23	408	18	1,142.55	228	468	23,551.64	5,043

*The figures for Massachusetts represent the condition of the fleet for 1879. The fleets for the other States are shown for 1880. During the last-named year not over twenty-five American vessels visited the Gulf of Saint Lawrence, some of these remaining only a few weeks.

C.—Table showing the mackerel fishing fleet of the United States, classified by States, according to kind of apparatus used.

State.	Total.			Vessels using line.			Vessels using net.			Vessels using line and purse-seine.			Vessels using purse-seine.		
	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.	Vessels.	Tonnage.	Men.
Maine	176	6,122.45	1,403	51	773.63	205	40	562.41	137	.....	.....	.....	85	4,786.41	1,061
New Hampshire	*11*	*567.59*	*113*	.....	.....	.....	.....	.....	.....	.....	.....	.....	*11*	*567.59*	*113*
Massachusetts	279	16,673.98	3,493	30	900.06	211	4	78.01	28	5	257.64	52	240	15,437.67	3,202
Connecticut	2	187.68	34	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	187.68	34
Total	468	23,551.64	5,043	81	1,673.69	416	44	641.02	165	5	257.64	52	338	20,979.29	4,410

D.—Table showing, by States, the quantity of mackerel taken by the New England fishermen in 1880, and the value of the same in the condition in which they were placed upon the market.

State.	Total.		Disposition of catch.				
	Pounds of round mackerel taken.	Value of mackerel as sold.	Pounds used for pickling.	Pounds used for canning.	Pounds used fresh for food.	Pounds used fresh for bait.	Pounds used fresh for fertilizer.
Maine	31,694,455	659,304	27,342,000	1,252,455	3,000,000	100,000	.....
New Hampshire	2,573,000	48,181	2,379,600	.....	193,400	.....	.....
Massachusetts	95,528,900	3,858,342*	72,153,900	3,705,000*	18,170,000	1,000,000	500,000
Rhode Island	89,000	1,669	.....	.....	89,000	.....	.....
Connecticut	1,303,900	24,976	1,266,900	.....	37,000	.....	.....
New York	750,000	14,062	.....	(?)	750,000	.....	.....
Total	131,939,255	$2,606,534	103,142,400	4,957,455	22,239,400	1,100,000	500,000

*Including both the fresh and salt mackerel used for canning.

As already intimated, there was a great falling off in the Canadian mackerel fisheries during the year, the bulk of the catch, which amounted to over 70,000,000 pounds, according to the Canadian Fishery Report,* being taken by the shore fishermen of Nova Scotia and Prince Edward Island. Of the entire quantity 233,669 barrels were pickled. In the Canadian report the average price of the salt mackerel is given as $9.25 per barrel, but as the fish were much inferior in quality to the American catch these figures are evidently incorrect. Statistics show that 105,730 barrels of the above, equal to nearly one-half of the catch, were marketed in the United States (and it is fair to presume that these were of average quality), where they were ordinarily sold at lower figures than the fish taken by the New England fleet. If we suppose the Canadian fish to be equal to those taken on our own shores (a supposition which is hardly warranted), the value of the catch, as given by the Canadian authorities, must still be reduced by $818,662, as the average price of the New England fish during the season was only $5.75 per barrel.

* Supplement No. 2 | to the Eleventh Annual Report of the | Minister of Marine and Fisheries | for the year 1880. ——— Fisheries Statements | for the year | 1880.———Ottawa: | Printed by MacLean, Roger & Co., Wellington street. | 1881.

The following table shows in detail the extent of the catch for the several Provinces:

Table showing the quantity and value of the mackerel taken in the Dominion of Canada in 1880, as shown by the Canadian Fishery Report.

Provinces.	Grand total.			Pickled mackerel.			Canned mackerel.			Page of Canadian Report from which the figures are taken.
	Pounds fresh mackerel required.	Value of prepared products, according to Canadian Fishery Report.	Value of prepared products at New England prices.	Number of barrels put up.	Average price per barrel.	Value.	Number of cans put up.	Average price per can.	Value.	
Ontario										292
Quebec	1,505,100	40,878	28,848	5,017	8.15	40,878				pp. 53, 76, 100, 118.
Nova Scotia	37,990,080	1,270,368	721,184	126,432	10.00	1,264,320	40,320	.15	6,048	165
New Brunswick	5,994,640	206,464	119,906	19,650	10.00	196,500	66,427	.15	9,964	215
Prince Edward Island	24,781,440	661,256	475,568	82,576	8.00	660,560	6,960	.10	696	249
British Columbia										269
Total	70,271,260	$2,178,966	$1,355,441	233,669	$9.25	$2,162,258	*113,707	$0.147—	$16,708	

* In estimating the pounds of fresh mackerel required and the value of prepared products at New England prices the cans shown here are regarded as 1-pound cans.

In the tables from which the above summary has been compiled no allowance seems to have been made for local consumption. A rough estimate of the amount used in this way would be 18,000,000 pounds, making a total catch for the Provinces of about 88,000,000 pounds, worth, at prices current in the United States, not far from $1,620,000.

Mackerel are not abundant in the waters of the Newfoundland coast, and few are taken by the fishermen. The returns for the year ending July 31, 1881, show that only 181 barrels were exported. This quantity, which equals 54,300 pounds of fresh fish, doubtless represents the bulk of the mackerel taken, as few are consumed locally. Allowing an equal quantity for local consumption, we have only about 110,000 pounds, valued at $1,650, taken by the islanders.

By combining the catch of the New England, Canadian, and Newfoundland fishermen we have the total product of the mackerel fishery for the Western Atlantic in 1880. This is found to be about 220,000,000 pounds of round mackerel, valued at $4,228,000. This value represents the fish as they are first placed upon the market. If the value to the consumer is desired the figures must be nearly doubled, to include the transportation charges and the profits of the various middlemen who handle them.

2. STATISTICS OF THE NEW ENGLAND MACKEREL FLEET FOR 1879, 1880, 1881.

By W. A. Wilcox.

Statement showing the number of vessels and their catch of salt mackerel in the Bay of Saint Lawrence and American shore mackerel fisheries for the season of 1879.

[Compiled from annual report of Boston Fish Bureau for 1879.]

Ports.	Vessels.			Barrels of mackerel.		
	Bay.	Shore.	Total.	Bay.	Shore.	Total.
MASSACHUSETTS.						
Newburyport	6	2	8	721	870	1,599
Rockport*		8	8			
Gloucester	26	85	111	7,125	47,085	54,210
Boston†	4	35	39	1,310	48,103	49,413
Cohasset		6	6		4,900	4,900
Wellfleet		22	22		17,200	17,200

* Vessels packed out away from home. † Numerous vessels packed out in addition to home fleet.

Statement showing the number of vessels and their catch of salt mackerel, &c.—Continued.

Ports.	Vessels.			Barrels of mackerel.		
	Bay.	Shore.	Total.	Bay.	Shore.	Total.
MASSACHUSETTS—Continued.						
Provincetown	*	5	5		4,354	4,354
Chatham		7	7		5,688	5,688
Harwich		11	11		10,938	10,938
Dennis	1	10	11	240	7,290	7,530
Hyannis		2	2		301	301
Total	37	193	230	9,396	146,729	156,125
NEW HAMPSHIRE.						
Portsmouth		9	9		6,225	6,225
MAINE.						
Deer Isle*		3	3			
Camden		3	3		1,020	1,020
North Haven†		6	6		1,278	1,278
Booth Bay		9	9		3,951	3,951
Portland	5	60	65	1,400	50,600	52,000
Total	5	81	86	1,400	56,849	58,249
Total for New England	42	283	325	10,796	209,803	220,599

* Vessels packed out away from home. † Vessels mostly packed out away from home.

Statement showing the number of vessels and their catch of salt mackerel in the Bay of Saint Lawrence, the New England shore, and the Southern mackerel fisheries for the season of 1880.

[Compiled from annual report of Boston Fish Bureau for 1880.]

Ports.	Vessels.				Total number of crews.	Barrels of mackerel.				Remarks.
	Bay.	New England shore.	South.	Total.		Bay.	New England shore.	South.	Total.	
MASSACHUSETTS.										
Newburyport	4	5	3	12	110		738		738	3,885 barrels packed at other ports.
Rockport	1	5	1	7	96	50	706		756	6,269 barrels packed at other ports.
Gloucester	15	61	34	110	1,650	2,189	124,477	2,954	129,620	Includes other than home fleet.
Boston	5	31		36	530	2,158	51,844		54,002	Several vessels packed in addition to home fleet.
Cohasset	1		6	7	100	390	5,856	600	6,846	
Wellfleet	6	5	20	31	450	30	28,707	500	29,237	
Provincetown		4	3	7	105		4,863	205	5,068	
Chatham		1	5	6	87		6,230	1,000	7,230	
Harwich		5	6	11	180		12,838	1,000	13,838	
Dennis		7	3	10	160		7,691	460	8,151	
Hyannis		2		2	30		500		500	
Total	32	126	81	239	3,498	4,817	244,450	6,719	255,986	
MAINE.										
Swan's Isle	2	2	6	10	145					All packed from home.
Deer Isle		2	2	4	56					All packed from home.
Camden		3		3	39		1,421		1,421	
North Haven		1	5	6	90			1,400	1,400	Vessels partly packed away from home.
Booth Bay		12	4	16	235		3,300	700	4,000	*Many of them packed away from home.*
Southport		5		5	70		3,100		3,100	Part packed from home.
Sedgwick			1	1	15					1,240 barrels packed away from home.
Portland		50		50	730	2,484	73,933		76,417	Many vessels in addition to home fleet included.
Total	2	75	18	95	1,380	2,484	81,754	2,100	86,338	
NEW HAMPSHIRE.										
Portsmouth		4	4	8	110		6,750	600	7,350	
Total for New England*	34	205	103	342	4,988	7,301	332,954	9,419	349,647	Inspected barrels.

* The New England shore fleet mentioned above are only the vessels that fish nowhere else; to which may be added the Southern and North Bay fleets after they returned from their unsuccessful cruise in those waters, making the total shore fleet three hundred and forty-two sail.

[In the annual report for 1881 some corrections are made in the returns of 1880: Shore fleet, 201; Southern fleet, 92; total fleet, 327; total crews, 4,778.]

Statement showing the number of vessels and their catch of salt mackerel in the Bay of Saint Lawrence, the New England shore, and the Southern mackerel fisheries for the season of 1881.

[Compiled from annual report of Boston Fish Bureau for 1881.]

Ports.	Vessels.				Total number of crews.	Barrels of mackerel.				Remarks.
	Bay.	New England shore.	South.	Total.		Bay.	New England shore.	South.	Total.	
MASSACHUSETTS.										
Newburyport	1		3	4	59					*
Rockport		6		6	65		290		290	‡ Total catch 3,590 barrels.
Gloucester	1	59	46	106	1,548	40	120,597	9,000	129,637	‡
Boston	1	15	5	21	296	290	63,768	5,611	69,669	†
Cohasset		7		7	100		8,013		8,013	
Wellfleet		33	3	36	508		30,977	500	31,477	5 sail packed at Boston.
Provincetown		8		8	120		6,175		6,175	3 sail packed at Boston.
Chatham							170		170	Weir caught.
South Chatham		1	4	5	75		8,940	1,470	10,410	
Harwich			9	9	146		4,388	5,500	9,888	*6,100 barrels landed at Booth Bay additional.*
Dennisport			3	3	45		2,646	900	3,546	
Fairhaven		1		1	13		220		220	1,500 barrels were caught.
Total	3	130	73	206	2,975	330	246,184	22,981	269,495	
MAINE.										
Swan's Isle		10	2	12	180			1,700	1,700	
Deer Isle		1	1	2	28		2,280	223	2,503	‡ Southern catch landed at New York and Philadelphia.
Camden		3		3	39					
Northhaven		5	5	10	120		500		500	‡
Booth Bay		4	9	13	185		14,259	800	15,059	‡
Southport		8		8	120		5,000		5,000	‡ 6,100 barrels of those landed by Harwich sail.
Sedgwick		1		1	15					‡
Portland		35		35	499	140	91,860		92,000	‡
Total		67	17	84	1,177	140	113,899	2,723	116,762	
NEW HAMPSHIRE.										
Portsmouth		5	3	8	106		3,700	1,700	5,400	‡
Total for New England	3	202	93	298	4,258	470	363,783	27,404	391,657	Inspected barrels.

* None packed at home port. † Numerous vessels from other ports included. ‡ Part of the catch landed at Boston and Portland. Amount given packed at home ports.

NOTE.—The New England shore fleet mentioned above are only the vessels that fished nowhere else, to which may be added the Southern and North Bay fleets, after they returned from their unsuccessful cruise in those waters, making the total shore fleet two hundred and ninety-eight sail.

3. STATISTICS OF THE MACKEREL FISHERY BY AMERICAN VESSELS IN THE GULF OF SAINT LAWRENCE, 1873 TO 1882.

By COL. DAVID W. LOW.

The following statement shows the extent of the mackerel fishery as pursued by American vessels in the Gulf of Saint Lawrence for the years 1873 to 1881. The number of vessels and their catch in the years 1873 to 1877, inclusive, is compiled from the reports of the collector of customs at Port Mulgrave, Nova Scotia; the number of vessels in 1878 and 1879 is from the same authority; the catch for 1878 and subsequent years and the number of vessels in 1880 and 1881 are from reports of the Boston Fish Bureau. The estimates of value and the catch within the three-mile limit are from authentic sources. The value includes the labor of crews "messing" some of the fish by soaking, scraping, and cutting off their heads, thus increasing their market value. The quantity of mackerel caught within the three-mile limit, one-third of the total catch, is considered by compe-

tent authorities to be a very liberal estimate. The unusual number of vessels in the Gulf in 1878 was caused by false reports and telegrams of great quantities of mackerel there. American vessels in the Gulf mackerel fishery must average 400 barrels of mackerel each at $10 per barrel to pay the expenses of outfit, insurance, depreciation of vessel, crew's share, and master's commission.

The mackerel fishery by American vessels in the Gulf of Saint Lawrence during the years 1873 to 1881, inclusive.

Year.	Number of vessels in Gulf.	Catch in sea-packed barrels.	Shrinkage in same, one-eighth.	Packed barrels.	Value when sold in United States per barrel, packing off.	Total value in United States of whole catch when sold.	Number of barrels caught inside three-mile limit, liberal estimate.	Value in United States of mackerel caught within three-mile limit, liberal estimate.
1873	251	88,012	11,001	77,011	$10 46	$805,535	25,670	$268,508
1874	164	63,078	7,885	55,193	6 25	344,956	18,398	114,987
1875	95	13,006	1,626	11,380	14 18	161,363	3,793	53,785
1876	64	5,495	687	4,808	11 60	55,773	1,603	18,594
1877	60	8,365	1,046	7,319	11 10	81,241	2,439	27,072
1878	273	.....	.....	61,923	4 15	256,980	20,641	85,600
1879	44	.....	.....	10,796	2 50	26,990	3,599	8,997
1880	34	.....	.....	7,301	7 72	56,364	2,433	18,783
1881	3	.....	.....	470	8 50	3,995	156	1,326
1882	1	.....	.....	275	8 50	2,125	95	717
Total	992	.....	.....	236,476	.....	1,795,327	78,827	598,429
Average per barrel	.....	.....	.....	.....	7 59	.....	.....	.....

Yearly average catch per vessel, 238.

4. STATISTICS OF INSPECTION OF PICKLED MACKEREL.

By A. Howard Clark.

The following tables show the quantity of pickled mackerel officially inspected according to the requirements of the State laws of New England, and also a comparison with the production of the Canadian mackerel fishery. The methods employed in packing the mackerel and a discussion of the laws relating to the subject will be found in the section of this report treating of Products of the Fisheries:

Table showing the number of barrels and value of pickled mackerel officially inspected in the United States for the years 1831, 1834 *to* 1838, 1851, 1864 *to* 1881.*

Years.	Massachusetts.	Maine.	New Hampshire.	Total quantity and value.	
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*	*Value.*
1831	283,548½	44,951½	21,450	449,950	$1,862,793
1834	252,879½	40,061	18,200	311,740½	1,437,123
1836	174,410	25,228	9,450	209,088	1,520,069
1837	138,157½	22,462	5,225	165,844½	965,214
1838	110,740½	24,312	3,420	138,472½	1,158,249
1851	329,244½	31,472	3,073	363,789½	2,484,679
1864	274,357½	49,797½	300	324,454½	7,001,098
1865	256,796½	54,215½	45	311,056½	5,729,851
1866	231,696 3/16	44,627½	200	276,523½	5,161,261
1867	210,314 1/16	39,675½	573	244,561 9/16	3,174,130
1868	180,056 15/16	28,774½	.....	208,830 11/16	2,924,987
1869	234,210½	37,166½	157	271,534½	3,762,965
1870	318,521½	52,304 1/16	3,700	374,525 1/16	4,400,563
1871	259,416½	48,603 3/16	2,071	310,091½	2,668,851

* The figures for the years 1834 to 1838 and 1851 are from Sabine's Report on the American Fisheries; for the years 1864 to 1877, from the State inspection returns; for the years 1878 to 1881, from the annual reports of the Boston Fish Bureau.

Table showing the number of barrels and value of pickled mackerel officially inspected in the United States, &c.—Continued.

Years.	Massachusetts.	Maine.	New Hampshire.	Total quantity and value.	
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*	*Value.*
1872	181, 956 $\frac{1}{6}$	22, 173	1, 878	206, 007 $\frac{1}{3}$	$2, 205, 761
1873	185, 748 $\frac{1}{2}$	22, 103 $\frac{13}{30}$	2, 398	210, 250 $\frac{3}{20}$	3, 167, 948
1874	258, 379 $\frac{13}{15}$	43, 741 $\frac{1}{3}$	5, 519	307, 640 $\frac{11}{15}$	3, 163, 701
1875	130, 062 $\frac{21}{68}$	9, 502 $\frac{1}{3}$	3, 415	142, 980 $\frac{11}{30}$	1, 439, 315
1876	225, 942 $\frac{17}{30}$	22, 429 $\frac{1}{3}$	5, 351	253, 722 $\frac{13}{30}$	1, 853, 103
1877	105, 037 $\frac{3}{10}$	22, 157 $\frac{1}{4}$	643	127, 898 $\frac{9}{20}$	1, 384, 223
1878	144, 205	48, 263	4, 000	196, 468	1, 408, 675
1879	156, 125	58, 249	6, 225	220, 599	1, 268, 444
1880	255, 986	86, 338	7, 350	349, 674	2, 398, 044
1881	269, 495	116, 762	5, 400	391, 657	2, 447, 556

Statement showing the number of barrels and value of pickled mackerel produced by the fisheries of the United States and of the Dominion of Canada from 1873 *to* 1881.

Year.	United States.		Dominion of Canada.		Total.	
	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.
1873	210, 250 $\frac{3}{20}$	$3, 167, 948	159, 530	$1, 615, 552	369, 880 $\frac{5}{20}$	$4, 783, 500
1874	307, 640 $\frac{11}{15}$	3, 163, 701	161, 090	1, 559, 551	468, 730 $\frac{11}{15}$	4, 723, 252
1875	142, 980 $\frac{11}{30}$	1, 439, 315	123, 654 $\frac{1}{2}$	1, 236, 545	266, 634 $\frac{7}{30}$	2, 675, 860
1876	253, 722 $\frac{13}{30}$	1, 853, 103	104, 356	992, 794	358, 078 $\frac{17}{30}$	2, 845, 897
1877	127, 898 $\frac{9}{20}$	1, 384, 223	163, 916	1, 639, 160	291, 814 $\frac{7}{20}$	3, 023, 383
1878	196, 468	1, 408, 675	183, 919	1, 766, 226	380, 387	3, 174, 901
1879	220, 599	1, 268, 444	190, 076 $\frac{1}{2}$	1, 745, 490	410, 675 $\frac{1}{2}$	3, 013, 934
1880	349, 674	2, 398, 044	233, 669	2, 162, 258	583, 343	4, 560, 302
1881	391, 657	2, 447, 556	105, 772	1, 046, 343	497, 429	3, 493, 899
Total 1873 to 1881	2, 200, 990 $\frac{23}{60}$	18, 531, 009	1, 425, 989	13, 763, 918	3, 626, 979	32, 294, 928