

D.—THE FISHING-GROUNDS OF THE GREAT LAKES.

BY LUDWIG KUMLIEN AND FREDERICK W. TRUE.

19. LAKE SUPERIOR.

On account of the peculiar nature of the fisheries of the Great Lakes, the fishing-grounds are all located comparatively near shore. In considering them, we shall begin at the western end of Lake Superior, and proceed eastward and southward toward the eastern end of Lake Ontario.

ISLE ROYALE TO KEWEENAW POINT.—Gill-net grounds of considerable importance extend almost without a break along the northwestern and southern shores of Lake Superior, from Isle Royale to within a few miles of Keweenaw Point, a distance of more than three hundred miles. The bottom is everywhere clayey, except about the Apostle Islands, where it is sandy and rocky. On the northwest shore of the lake, the depth of water at the outer limit of the grounds varies from eighty to one hundred and forty fathoms, but on the south shore it is much less, being not greater than eighty fathoms at any point.

The grounds on the northwest shore are visited by Duluth fishermen in the fall. They fish commonly about forty-five miles from the village, but frequently go forty or fifty miles further north. In the spring and summer they set their nets at different points along the south shore, between Duluth and the Apostle Islands, but in the earlier part of the season they fish mostly at a station about twenty miles east of the village.

A portion of the grounds, extending eastward from the Apostle Islands one hundred and twenty-five miles, is visited by the fishermen of Bayfield and Ashland. The most favorable localities are off Iron River and Little Girl's Point, and in the vicinity of the Porcupine Mountains and Sleeping River. Different stations from Bark River to beyond Ontonagon are occupied at different times, according to the season and the movements of the fish. In the fall the nets are removed from the south shore and carried across the lake to Isle Royale.

The pound-net grounds of this district are located among the Apostle Islands and in the immediate vicinity. Other portions of the coast are too much exposed to the violence of storms, and in other respects are unsuitable for pound fishing. We may except, however, the sandy bar near the entrance to Superior City, where, in 1879, two pounds were located. During the same year one pound was set in Bark Bay, three in Siskowit Bay, sixteen among the Apostle Islands, mainly inshore, and from the islands nearest the mainland, and seven on the south side of the long sandy bar at the entrance of Chaquamegon Bay.

The most westerly seining-grounds of the lakes are at Superior City and Fond du Lac. In the former locality a very little seining for whitefish is prosecuted late in the fall. At Fond du Lac, at the head of Saint Louis Bay, the seining is more extensive, but the catch consists entirely of pike. There are many seining-reaches farther to the eastward, between Bark River and Bayfield, particularly in the smaller bays and among the islands, but the grounds are changed so often that it is quite impossible to locate them accurately. Bark Point, however, may be mentioned as one of the most favorable localities.

In winter small quantities of pike are taken in different parts of Saint Louis Bay with hook and line, and in the deeper passages among the islands near Bayfield considerable numbers of trout are caught.

ISLE ROYALE.—The fishing-grounds at Isle Royale are mostly off the south shore. The bottom is rocky for more than a mile from the island, but becomes clayey beyond. The fishermen set their gill-nets on the inshore rocky reefs early in the fall, but later in the season follow the fish into deeper water. They frequently set their nets in one hundred fathoms of water. The catch consists principally of trout. The Isle Royale grounds are frequented by the fishermen of Bayfield and of other localities on the south shore of Lake Superior.

KEWEENAW POINT TO GRAND ISLAND.—Gill-net grounds extend along this entire stretch of coast, except between Big Bay Point and Sauk's Head, a distance of about fifteen miles. The land is high at many points, and the water deep at a short distance from shore. The inshore bottom is rocky, but between Keweenaw Point and Big Bay Point it changes to clay and mud farther out, while from Sauk's Head to Grand Island sand and gravel largely predominate. The outer limit of the grounds is uniformly about seven miles from shore, where the water is forty or forty-five fathoms deep, except opposite Marquette and Train Bay, where the fishermen frequently fish ten miles from shore, in water from fifty to seventy fathoms deep.

The fishermen of L'Anse and the neighboring villages commonly set gill-nets in the fall on the west side of Keweenaw Point, opposite the entrance to the Portage Lake canal. In winter they keep near shore, generally fishing in L'Anse Bay, but in warmer weather they venture into deeper water, visiting various reefs and shoals, the position and extent of many of which is known only to themselves. A large share of the fishing is also carried on in the vicinity of the stations where pound-nets are set.

All fishing prosecuted between Sauk's Head and Grand Island is carried on by fishermen from Marquette. In the fall the grounds off Shot and Granite Points are visited, while in the spring the larger proportion of the gill-netting is prosecuted off Big Presqu' Isle and in the vicinity of Grand Island.

The principal pound-net stations of this section of the shore are at Bete Grise Bay, Portage Entry, Keweenaw and Huron Bays, the shallow bay east of Marquette, and the channel between Grand Island and the mainland. Between Keweenaw Point and Sauk's Head the nets are set in seventeen to forty-five feet of water, while further to the eastward the extremes are twenty and twenty-eight feet. During the year 1879 the pounds were distributed as follows: In Bete Grise Bay, one; at Portage Entry, two; in Keweenaw and L'Anse Bays, seven; in Huron Bay, two; between Granite Point and Presqu' Isle, one; between Marquette and Shot Point, three; and in the channel between Grand Island and the mainland, four. In 1878, and again in 1880, there were two more pounds at Grand Island. Some of the more intelligent fishermen of Marquette are now seeking some reef or shoal within convenient distance of that village, where they may catch larger quantities of fish. All the shoals now known are so far distant that they are unable, with their sail-boats, to reach them and return in one day. Many of the best pound-net grounds cannot be utilized on account of their exposed position. Even in the more sheltered localities, in stormy seasons, serious losses of netting are frequently sustained.

Small and unimportant seining-grounds exist at L'Anse and Portage Entry. Eastward the seining is prosecuted entirely in and about Marquette Harbor, and even these grounds are productive of very little except herring.

Stannard's Rock, a dangerous reef lying about forty-five miles due north of Marquette, is one of the most important trout-grounds of the Great Lakes. Marvelous stories are told

regarding the quantities of trout taken there. The grounds extend ten or twelve miles from the rock in every direction, and the water at the outer limit is more than one hundred fathoms deep in many places; the bottom is rocky and clayey. It is a very favorable place for hook-fishing, and is visited from time to time by the fishermen of Marquette.

GRAND ISLAND TO SAULT DE STE. MARIE AND DETOUR.—There are but few fishing-grounds along the south shore of Lake Superior east of Grand Island, except at Whitefish Point. Gill-net grounds extend a few miles on either side of the point, and five or six miles from land. The water is comparatively shallow and the bottom everywhere sandy. A tug visits the western grounds at certain seasons. The fishermen state that the water has receded considerably at this point within the past five years, and that fisheries of all kinds, except gill-netting, have been less successful than formerly.

The exposed condition of the coast about Whitefish Point renders the successful establishment of pound-nets quite impossible. During 1879, however, one net was set a short distance west of the point, and another to the south of it, in Whitefish Bay.

Large quantities of whitefish are caught with dip-nets in the rapids at Sault de Ste. Marie by the Indians. Not infrequently several hundred pounds are taken by a single canoe in one day. Grounds of limited extent exist in Whisky Bay, on which small quantities of fish are taken with trap-nets.

20. LAKE MICHIGAN AND THE STRAITS OF MACKINAC.

POINT DETOUR TO SEUL CHOIX POINT.—The fishing-grounds in the Straits of Mackinac and vicinity are widely scattered and difficult of location, and it is quite possible that some of them have escaped observation.

The first important gill-net ground west of Detour Passage extends from Strong's Island, about sixteen miles in a southeasterly direction, to and about Spectacle Reef. The water is very deep in the southern part of this ground, in some places approaching three hundred fathoms, but about Spectacle Reef and near shore it is of course comparatively shallow, although in some spots, in very close proximity to the former, from forty to sixty fathoms may be found. The nature of the bottom differs very much in different parts of the ground, but mud, sand, and rock predominate. This ground has the reputation of being exhausted at the present time, and very little fishing is prosecuted on it.

Some little gill-net fishing is carried on between Mackinac and Round Islands and to the westward of the latter, and also for a short distance along the shore north of Point Saint Ignace. These grounds are frequented, however, only by fishermen using but ten or twenty nets, who sell their fish to the steamers and hotels.

The whole northern shore of Lake Michigan, from the straits to Seul Choix Point, is one vast gill net ground. It is considered one of the best on the lake. Fishing is carried on at a distance of ten, fifteen, or even twenty miles from land. The favorite grounds are southeast of Point Patterson, between Simmons's Reef and Point Epoufette, westward of Saint Helena Shoal, and southwest of Point aux Chenes. On the first-mentioned ground the bottom is chiefly sandy, but on the others the sand is largely mingled with rock and clay. The depth of water does not exceed sixteen or eighteen fathoms at any point, the average depth being considerably less.

The boats fishing on these shoals belong at different points along the north shore and at Mackinac. Many Beaver Island boats also fish here, especially on the southern borders of the grounds.

Between Detour Passage and the Straits of Mackinac there are but two permanent pound fisheries. One is located at Strong's Island, the most easterly of the Les Cheneaux group. Seven pounds were employed here in 1879. It is a very important and productive fishery. The second is situated at the head of Saint Martin's Bay, where, in 1879, six shoal-water pounds were established.

On the north shore of Lake Michigan, west of the Straits of Mackinac, we find the most extensive and profitable fishing-grounds of the lake, as regards both pound-net and gill-net fishing. The first pound-nets to the eastward are those established at Gros Cap Point, eight and one-half miles west of Point Saint Ignace. The "Six-mile sand-beach," further to the west, at Point aux Chenes, is a noted and productive ground. From this point westward we find pound-nets scattered along the shore at Point Eponfette, Biddle Point, Mille Coquins Point, Point Patterson, and Scott's Point. Between Point Saint Ignace and Scott's Point, a distance of less than fifty miles, there were located in 1879 more than sixty pound-nets, and about seventy-five gill-net boats also fished there.

Along this coast the pound-nets are all set quite close inshore, and generally each man's nets in a line. Prominent exceptions, however, are furnished in the case of two firms, each of which sets two nets on a shoal about seven miles south of Mille Coquins Point. Another firm has nets set in deep water about nine miles south-southwest of Point Eponfette, and two more are set a short distance west of Simmons's Reef, and about the same distance directly south of Point Eponfette. The latter two are among the most profitable pound-nets on this shore.

THE BEAVER ISLANDS.—The shores of the Beaver Islands present very favorable conditions for the establishment of pound-nets, and they have therefore become the center of an extensive fishery. The bottom consists chiefly of sand, although in some parts, especially on the west shore of the main island, rocky grounds are very abundant.

In 1879 thirty-two pound nets were in use at the islands, sixteen of which were located on the east side of the large island which gives its name to the group, and constituted the Sand Bay fishery. Of the remaining nets, two were located at the north shore of Hog Island, two at High Island, and the others at the north, east, and south shores of Beaver Island.

At Beaver Harbor, near Saint James post-office, in the northeastern portion of Beaver Island, there is an extensive seining-reach, where, in 1879, two seines were employed.

Off Gull Island, the most westerly of the Beaver group, is a noted gill-net ground. The island is owned by three persons, each of whom employs two boats in the fishery.

SEUL CHOIX POINT TO POINT DETOUR, GREEN BAY.—The only fishery between Seul Choix Point and Point Detour is located at Point aux Barques, where, in 1879, sixty gill-nets were employed. The ground extends about four or five miles from the point, the outer limit being in about twenty fathoms of water. The bottom is generally hard and sandy.

GREEN BAY.—The fisheries of Green Bay are very extensive, and quite varied in character. The bay is a body of water of no mean proportions, being about two hundred miles in length and twenty miles in breadth at the widest part, or somewhat more than twice the size of Lake Champlain. There are many large and flourishing towns on the west shore, while the east shore is comparatively unoccupied.

In considering the fishing-grounds we shall begin at Point Detour, at the entrance of the bay, and having spoken of the grounds in Big and Little Bays de Noquette, pass southward along the west shore to Green Bay City, and thence northward along the east shore to Porte des Morts.

At the entrance of Green Bay, extending around Summer Island, within a radius of about six miles, we find an important gill-net ground, known as the Sag Bay ground. West of and adjoining the Sag Bay ground is another, six or eight miles in diameter, called the Summer Island ground. As many as three hundred and fifty gill-nets are annually employed there. Extending in a southwesterly direction from the grounds already mentioned, and directly north of Washington Island, is still another and much larger ground styled the Washington Island ground. Every summer about six hundred gill-nets are in use here, and in the fall the number swells to one thousand. The bottom, as might be expected on account of the great extent of the ground, varies considerably in character, but is generally hard and sandy. The water is comparatively shallow, the maximum depth not exceeding twenty-three or twenty-four fathoms.

• There are no extensive gill-net grounds in either Big or Little Bay de Noquette, although in the latter some nets are used in winter under the ice. A few miles south of the entrance to Little Bay de Noquette, and east of Indian Town, we find a ground which supports about one hundred and thirty-five nets. The character of bottom and depth of water are about the same as those of the Washington Island ground, which, in fact, it touches at its western limit.

Between this ground and the next to the southward, a space of about five miles intervenes. The latter ground extends from near shore, in a southeasterly direction from the mouth of Bark River, about nine miles. The depth of water at the outer limit is about seventeen fathoms, and the character of the bottom is similar to that of those previously mentioned.

Farther south there are no more important "open-water" gill-net grounds, or such as are visited during the warmer weather, either on the west or east side of the bay, except at Green Bay City. The grounds extend for about two miles along the low and marshy shores at the mouth of Fox River. The nets are set in the numerous sloughs running into the marsh, and are visited every two days. Nothing is taken in them but rough fish. The only large ground still unmentioned is the Saint Martin's ground, which extends from the island of the same name into Lake Michigan eastward, northeastward, and southeastward, about eight miles.

As we have stated already, "open water" gill-net fishing has died out almost entirely south of the Bark River ground except at Green Bay City. One fisherman set a few gill-nets in 1879 directly north of the bar at the mouth of the Peshtigo River. Summer gill-net fishing is also carried on to a limited extent on the east shore, between Bay Settlement and Chambers Island, especially at the entrance of Little Sturgeon Bay, where formerly it was extensively pursued.

In winter, as soon as the ice is sufficiently firm to be walked upon with safety, the fishermen begin setting their nets. The grounds are located almost anywhere outside the ten-fathom line, often in the middle of the bay, and the nets are moved from time to time. Very few are in use north of Menomonee, many of the more important pound-owners not possessing any. Southward as far as Peshtigo they increase in number. A few are set off Suamico and between Bay Settlement and Chamber Island, on the east shore. They are set across the bay, in gangs of from five to thirty, and anchored.

The pound-net fisheries of Green Bay are very extensive and important. The larger proportion of the nets are set on the west shore, between Cedar River and Green Bay City, but many are also scattered over other parts of the bay.

On the north shore of Saint Martin's Island, at the entrance of the bay, we find the largest and deepest pound-net on the Great Lakes. The pot stands in ninety-seven feet of water, and is inclosed by stakes one hundred and twenty-five feet long, spliced three times. The net cuts off a deep channel by which the fish appear to enter the bay, and the catch is very large.

On the west shore of Big Bay de Noquette, between Saint Vital Point and Chippewa Point, seven pounds were in operation in 1879. The shores of the bay are unsettled, and the region is too far away from any shipping point to enable men to carry on the fisheries successfully. It is believed, however, that the bay abounds in fish.

At the mouth of Big Bay de Noquette, about midway between Peninsula Point and Summer Island, and nearly seven and one-half miles from any land, there is a small pound-net ground, where, in 1879, five pounds were located. The bottom is hard, and the depth of water varies from six to eight fathoms. The ground is very productive.

On the eastern shore of Little Bay de Noquette, directly opposite Escanaba, there were, in 1879, three pounds; at Masonville, at the head of the bay, one; and on the west shore of the entrance of the bay, about five miles south of Escanaba, three. The latter are so near the mouth of the bay that whitefish are caught in them in considerable quantities.

Directly opposite Indian Town, on the west shore, and about six miles from land, we find two more pound-nets. They are set in about thirty feet of water, and are very productive. They are about the only pounds that take considerable quantities of trout. A few miles farther south, but close inshore, there are two more pounds.

Between Cedar River and Little Tail Point, ten or twelve miles north of Green Bay City, we find a remarkably large number of pound-nets. In 1879 there were no less than one hundred and twenty nets situated along this section of coast. In the vicinity of Cedar River the water is very deep near shore, many of the pounds being in seventy-five feet of water, but southward the shore slopes more and more gently, forming sandy reaches, over which the water is but twenty or thirty feet deep. Between Menomonee and Suamico the nets are set on these shoals.

About four miles above the mouth of Little Suamico River, and three and one-half miles from shore, a rocky reef, nearly three miles in length, extends north and south. One net is usually set inside the reef and three placed in line east of it, the one farthest eastward being about five miles from shore.

The catch in all the pounds on this section of coast consists principally of herring.

The pound-net grounds of Green Bay City are located near the mouth of Fox River, in about fifteen feet of water. Four large pound-nets and seventeen "baby-pounds" owned in the city, together with a number of others, were employed here in 1879.

At the present time the pound-net grounds of the east shore of Green Bay are located between Shoemaker's Point and Little Sturgeon Bay. The whole extent of coast occupied is not more than six miles. Two nets are also set off Chambers Island. The latter grounds were formerly of great importance, but they are now almost abandoned.

At the head of Big Bay de Noquette, in Ogontz Bay, there is a single seining-reach, and another at the head of Little Bay de Noquette. The catch in these nets consists chiefly of rough fish and sturgeon, whitefish and trout not being found so far up in the bays.

There are but four seining-reaches on the west shore of Green Bay which are now visited by the fishermen. Two are located a short distance south of the mouth of the Menomonee River. There is also one at the mouth of the Suamico River, and one at the mouth of the Oconto River. Both, however, are insignificant, no large hauls having been made within seven years. Formerly seining was a leading industry in this section, but many of the old grounds are now occupied by pound-nets. From 1858 to 1865, seines were used on all suitable shores in this vicinity, and large quantities of fish were taken.

At Green Bay City five large seines were in use in 1879. The yield of this fishery is very large.

On the shoals south of Green Island, which is situated in the middle of the bay, southeast of Menomonee, hook-fishing is prosecuted to a considerable extent. Prior to 1867, this fishery was quite extensive and important.

At Green Bay City about one hundred and fifty fyke-nets are set in Fox River, near the mouth, and various species are taken.

Hook-fishing is carried on on the east shore of Green Bay, in Door county, to a very limited extent.

De Pere being situated at the head of Fox River, and not directly on Green Bay, its fisheries may be more properly considered separately, although they are of little importance. The catch consists principally of dory, pickerel, catfish, and sturgeon, but some whitefish are also taken. A number of small gill-nets are used and two seines, together with about one hundred dip-nets. In the latter many kinds of fish are taken, such as moon-eyes, which are only used for manure or as bait for catfish.

PORTE DES MORTS TO PORT WASHINGTON.—The first gill-net grounds on the west shore of Lake Michigan, south of Porte des Morts, are near Jacksonport, around the Cana Islands. Gill-net fishing was formerly prosecuted here to a considerable extent, but pound-nets have gradually taken their place so that only about a hundred gill-nets remain between Porte des Morts and Clay Banks, a distance of about thirty miles.

The next gill-net ground is at Clay Banks. It extends about two miles north of the village and the same distance south of it. At the outer limit the water is from ten to fourteen fathoms in depth and the bottom is everywhere rocky. The principal species of fish caught here is the trout.

About four miles south of Clay Banks we find another small gill-net ground. In 1879 there were two small gangs of fishermen here who employed gill-nets in taking trout. As a rule they fish in not more than ten fathoms of water.

Between Stony Creek and Two Creeks on the south, a distance of about twenty-five miles, there are no fishing-grounds of any sort. At Two Creeks, however, we reach the upper end of the great gill-net grounds, frequented by the fishermen of Two Rivers. These grounds extend from nearly opposite Two Creeks on the north to Manitowoc on the south, a distance of about fourteen miles. The inner limit of the grounds is uniformly about two miles from shore, where the water is from ten to fourteen fathoms in depth. At the outer limit of the grounds, about ten miles from shore, we find eighty or ninety fathoms of water. This outer region, however, is visited only by the tugs, the smaller Mackinac boats fishing closer inshore. The catch consists chiefly of trout, blackfins, and lawyers.

Passing southward we find the next gill-net ground opposite Sheboygan. This ground extends from two and one-half to eighteen miles from shore, the water varying from twelve to sixty or seventy fathoms in depth. This ground was abandoned in 1866 on account of the scarcity of fish, but a few years later, fishing being resumed, the yield was as large as, or larger than, ever before known.

The most northerly pound-net ground on this section of coast is located at Jacksonport. The grounds are situated a little to the southward of the village, and the nets are usually set about a mile from shore. At Whitefish Bay, about seven miles south, is one of the oldest and best known whitefish grounds on the lake. The bottom here is ridgy, clay and gravel alternating in furrows. This kind of bottom is believed to be that most frequently visited by whitefish.

The next pound-net ground to the southward is located between Two Creeks and Manitowoc, and between the shore and the outer limit of the great Two Rivers gill-net ground. The bottom

is generally sandy and the maximum depth of water not more than six or seven fathoms. In 1879 thirty-three pounds were situated here.

Another pound-net ground is located about thirteen miles north of Port Washington, opposite the small village called Amsterdam. The ground extends about four miles north and south. The bottom is everywhere sandy. The pounds are usually set in from twenty-five to sixty feet of water. Pound fishing was first introduced here in 1862.

At Oostburg there is a pound-net ground extending along six or seven miles of shore. The outside nets are located about a mile from shore.

At Port Washington the nets are usually set in from thirty to fifty-five feet of water, the majority being in about forty-five feet.

There are no shoals or reefs in the immediate vicinity of Jacksonport, but at a distance of twenty-five miles there is an extensive shoal which was formerly a very famous trout ground. It is now seldom visited.

PORT WASHINGTON TO SOUTH CHICAGO.—The most important gill net grounds within these limits are in the vicinity of Milwaukee. The fishermen set their nets in a southerly and southeasterly direction from Milwaukee from ten to forty miles, northward to northeastward forty to ninety miles, and eastward from fifteen to fifty miles. The principal outside ground is the Big Reef, which is situated directly opposite Milwaukee, at a distance of about forty miles, but runs in a southeasterly and northwesterly direction, so that its most northerly limit is only about fifteen miles off shore opposite Port Washington. Inside of this reef and only about six miles from shore there is another productive ground.

During summer the fishermen go to the outside reef, but in the fall, when the fish are spawning, they visit the inner one. Mr. Schultz, of Milwaukee, states that there are apparently less fish on the outer reef than there were twenty-five or twenty-six years ago, but that there has been no perceptible diminution on the other portions of the grounds.

The gill-net grounds at Racine extend from Wind Point, a short distance north of the city, to about four miles south of the city. The nets are usually set at distances of from three to twenty miles from shore, the water varying in depth from ten to seventy-five fathoms. The greater portion of the fishing, however, is done in water about twenty fathoms deep and from six to ten miles from shore. The catch consists principally of whitefish, trout, and lawyers, and rarely a few other kinds of no commercial importance.

We find the next gill-net ground about three miles south of Kenosha. The southern portion of this ground is about fifteen miles distant from shore. The boat fishermen fish from twelve to sixteen miles from shore, but the tugs sometimes go as far as twenty miles. At the outer limit of the ground the water is about seventy-five fathoms deep.

In the vicinity of Milwaukee the only pound-net station is in Whitefish Bay, a short distance north of the city. Only two nets were in use there in 1879.

In the vicinity of Waukegan pounds are set along the sandy beach for a distance of about twelve miles, the northern limit of the ground being about nine miles north of the city. The bottom slopes gently from the shore, and the character of the ground is such that there is no difficulty in driving the stakes firmly. The quantity of fish taken here is about one-fourth less than it was twenty years ago. In 1879 twenty-nine nets were located on different parts of this ground.

At Chicago a few nets are set directly off the mouth of the river in comparatively shallow water, and at South Chicago also the pounds are located very near shore.

SOUTH CHICAGO TO SAUGATUCK.—There are no fishing-grounds at the head of Lake Michigan, between South Chicago and Michigan City. Between Michigan City and Saint Joseph the gill-net grounds are situated a long distance from shore. In summer the fishermen commonly go seven to fifteen miles from shore, and in winter much farther. The water, however, on these grounds is comparatively shallow, at a distance of twenty miles being not more than twenty-eight fathoms. The bottom is principally sandy, but clay and gravel predominate in some places. From New Buffalo northward the grounds curve gradually outward, the outer limit opposite Saint Joseph being from eight to twelve miles in summer, and in winter from fourteen to twenty miles. Beyond Saint Joseph the outer boundary curves inward again, until at South Haven it is quite near shore. Although the distance to which the boats go is very great, the water is not deep at the outer limit, being scarcely more than sixty fathoms. A few miles south of Saugatuck and comparatively near shore there is a whitefish spawning-ground, which for a long time has been very productive. In 1879 the fishing at this point proved almost a failure. With the exception of this ledge, the bottom is generally sandy or clayey, and the fishermen set their nets almost anywhere in certain depths with equally good success. One fisherman stated that he had fished with his boat to a distance of twenty-five miles due west from Saint Joseph, but it is certainly dangerous for the fishermen to go such distances in small boats, although the steam-tugs, of course, can safely go much farther.

Hook-fishing is carried on on the same grounds opposite Saint Joseph.

In former years seining was carried on to a considerable extent on this coast, but at the present time the fish do not come inshore. It is supposed that the foulness of the rivers has driven them into deeper water.

The pound-net grounds of this section extend from a few miles south of Michigan City to New Buffalo. All the nets are set close inshore, in water from twenty-five to fifty-two feet deep. The bottom consists of hard sand, and is very suitable for the driving of stakes.

SAUGATUCK TO MANISTEE.—From Saugatuck northward the grounds gradually extend outward, and at Grand Haven it is not an unusual occurrence for a boat to go out thirty miles. North of Grand Haven the outer boundary again bends inward, and at Whitehall boats usually fish not further than from two to four miles from shore. The most productive parts of this ground are said to be at Whitehall and Muskegon, but as there are no good shipping facilities at these points, very little fishing is done. No particular kind of bottom is sought for by the gill-netters, the depth of water appearing to be a more important consideration. It is supposed that in cold weather the fish pass out into deeper water, as it is found necessary in winter to go a much longer distance from shore than in summer in order to find profitable grounds.

At Pentwater most of the gill-net fishing is prosecuted in about forty fathoms of water, though the fishermen occasionally go as far as fifteen miles from shore, where the water is seventy or seventy-five fathoms in depth. These grounds are considered to be less productive and to have been greatly damaged by mill refuse. At Ludington most of the fish are taken at a distance of about ten miles from shore, but northward the outer limit of the ground gradually comes nearer and nearer shore. The most productive portion of this ground is at Big Point Sable, although even here fish are much less abundant than formerly. In 1875 the firm of Wilson & Brothers had a line of gill-nets in use here, which was about eight miles in length.

But little gill-net fishing is carried on at Manistee. A few boats fish here in from nine to forty fathoms of water, the outer limit of the ground being about eight miles from the shore.

There are but few pound-net stations along this whole section of coast. A short distance on either side of Big Point Sable six pounds were established in 1879, set close inshore, in from thirty to forty feet of water. A short distance from Ludington one pound is in use.

MANISTEE TO CROSS VILLAGE, INCLUDING LITTLE AND GRAND TRAVERSE BAYS AND FOX ISLANDS.—The most southerly gill-net grounds of this section, of any importance, are situated on the west shore of Grand Traverse Bay between Cat-Head Point and Sutton's Point. Of these the most noted are at the entrance of Grand Traverse Bay, where vast numbers of blackfins are taken. One of the greatest spawning-grounds in the lake is situated off Light-house Point to the eastward and northeastward, but from its position it is so exposed to the winds, and the bottom is also so rocky, that no fishing can be done. South of New Mission Point there are no fisheries in Grand Traverse Bay, on the west shore, except in Sutton's Bay, where large quantities of herring are taken. On the east shore there is but one fishery, which is situated a little to the north of Torchlight Lake.

The most southerly pound-net station of this section is at Good Harbor Bay, where, in 1879, two nets were located. In Grand Traverse Bay there are several important stations, the one most worthy of notice being in Northport Bay. Six nets were in use here in 1879. Just north of Northport Point we find three more nets. At Hog Island, near the head of the west arm of Grand Traverse Bay, there is one pound-net station where one net is located. North of Grand Traverse, between Petoskey and Cross Village, there are three pound-net stations. Two are located on the north shore of Little Traverse Bay, and one farther northward near its mouth. *Five nets in all were employed at these stations in 1879.*

Important gill-net grounds extend from Charlevoix to Cross Village. The outer limit of the ground is about 4 miles from shore. Fishing is carried on at all seasons. The maximum depth of water is about 45 fathoms. The bottom is rocky and clayey.

Off the east shore of North Manitou Island there is a small gill-net ground, which is visited by three fishermen. The water varies from thirty to sixty fathoms in depth. The bottom is clay.

Due east of South Manitou Island, a distance of about three miles, there is one pound-net station.

Gill-net grounds extend about South Fox Island to the outer limit of the great sandy shoal which exists there. The fishermen fish on the north and east shores of Fox Island in summer, but in winter usually fish most extensively on the west shore. Between the two islands two pound-nets are located.

CROSS VILLAGE TO LAKE HURON.—Between Cross Village and Point Wangoshance there are a few pound-net stations, but in 1879 the fishery proved almost a failure. The shore is too rocky and exposed for successful fisheries of this sort. Two pound nets are set to the northward of Wangoshance, a few miles east of old Fort Mackinac.

21. LAKE HURON.

STRAITS OF MACKINAC TO ALCONA.—Very little fishing is done on the section of coast between Point Wangoshance and Thunder Bay Point. In Hammond's Bay, near the eastern entrance of the Straits of Mackinac, there are eleven pound nets.

The Alpena gill-net grounds are located east and north of North Point as far as, and beyond, Middle Island, the outer limit being about fifteen miles from shore. There is no gill-net fishing in Thunder Bay proper. It is estimated that the abundance of fish here is only one-third what it was ten years ago.

The pound-net stations in Thunder Bay are situated on the north shore, between North Point and Whitefish Point. Fifteen nets were located here in 1879. On the shore at the north of Sulphur Island, in four or five fathoms of water, there are four nets. The bottom on this ground is very hard and stony.

ALCONA TO POINT AUX BARQUES, INCLUDING SAGINAW BAY AND THE CHARITY ISLANDS.—Gill-net fishing is not prosecuted to any considerable extent on this shore. The pound-net fishing of Saginaw Bay is very important. The shores of the bay are very sandy, and great shoals extend from the shore, upon which pounds can be established very firmly. The most westerly station is at Ottawa Point, near the mouth of the bay, where two nets are located. Three other stations on the west shore of the bay are located at Gravelly Point, Point aux Grès, and south of the shoal at the mouth of Rifle River. At the head of the bay the stations are very numerous. They are set at approximately regular intervals along the whole shore between Nayaliquing Point and Fish Point. Not less than one hundred nets were in use within these limits during the year of the canvass.

The sandy shoal, on which the nets at the head of the bay are placed, extends out a great distance from the west shore, and in this part of the bay four lines of nets, comprising in all about fourteen, are located at distances of from six to eight miles from land. Three other stations are located respectively at North Island, the main shore about four miles north of Sebewaing, and at about two miles east of North Mineshas Island, at the edge of the inner shoal. The most easterly shoal occupied by pounds is that making off north of Sandy Point. Four lines of nets were in use here in 1879. Three lines of nets are also located on the shoals which extend from the Charity Islands, situated in the middle of Saginaw Bay near the mouth.

The Charity Islands fisheries are considered to be the most profitable on the whole chain of lakes. On the north and northeast portion of these grounds, however, the nets are greatly exposed to storms, and heavy losses frequently occur.

Seine fisheries are still carried on quite extensively in this district. At the head of the bay, on the west shore, there are several important seining reaches. The principal ones are situated, (1) near the mouth of the Saginaw River on the west side of the mouth of the Ogahkoning River, (2) midway between the Opinkawning and Saginin Rivers, (3) midway between the Rifle and Pine Rivers, and (4) on either side of Gravelly Point. The last three fisheries are carried on by the Indians. The one between Rifle and Pine Rivers is the oldest and best known seine-fishery in Saginaw Bay.

There are no gill-net fisheries in Saginaw Bay proper, but to the northward of Point aux Barques and Point au Sable there are several important grounds. Some gill-netting is still carried on in winter, but this branch of the fisheries has declined very much within the last ten years. The same may also be said of the seine-fisheries, but on the other hand the number of pound-nets has considerably increased within that time.

The winter fishing in Saginaw Bay is very important, and gives employment to a large number of men. Not only gill-nets and pound-nets, but hooks and spears are used, the last being by far the most convenient and effective device for the capture of fish. The location of the spearing grounds varies according to the season and the thickness of the ice. The fishery is usually carried on, however, outside of a line drawn from Point aux Grès to the west shore of Sebewaing. During a profitable season quite a village springs up on the ice, and a variety of supplies are brought out by the buyers of the fish. It is stated, however, that the fishery is becoming less and less profitable every year. A few years ago the spearing was so profitable that a supply of fish could always be

depended upon, but the experience of the last few years seems to show that the decrease has been so great that dealers will no longer depend upon obtaining a supply from the spearmen.

Besides the bay fisheries, there are quite a number of pound-nets located in Saginaw River, extending from its mouth about twenty miles inland. They are set in from ten to twenty-four feet of water, and large quantities of fish, especially pike, perch, and suckers, are taken. *The river fishery differs somewhat from the bay fishery, inasmuch as it is only prosecuted in winter.*

At the mouth of the Ojibwaning River, a pond about two acres in extent has been constructed for the purpose of keeping fish when caught in great abundance, so that when the amount of fish taken is small the fishermen may still be able to supply the demand of the dealers. The pond is now only six feet in depth, but the owners propose dredging it and also extending its area.

POINT AUX BARQUES TO PORT HURON.—Gill-net fishing is prosecuted all along the shore of Lake Huron from Point aux Barques to Port Huron, the principal stations being at Port Austin, Grindstone City, Huron City, Port Hope, Sand Beach, White Lake, Forestville, Port Sanilac, and Lexington. Fishing is carried on more or less extensively at all these points, but the most important are Sand Beach and Port Hope. The grounds extend from five to twenty-five miles from shore. *The catch consists mainly of whitefish and trout.*

There are no pound-nets in use between Point aux Barques and Port Huron, the shore being much exposed to the violence of storms. There are many seining reaches all along this section of coast, but the fishing is not carried on so extensively as formerly.

PORT HURON TO DETROIT, INCLUDING SAINT CLAIR RIVER AND LAKE SAINT CLAIR.—All fishing in Saint Clair River is carried on by means of seines. The grounds extend along twenty miles of the river, and there are in all five fisheries on the American side. Seines are also employed along the shore of the lake, but not so extensively as formerly. The season opens about the middle of May and lasts until August.

FISHING-GROUNDS ON THE DETROIT RIVER.—The fisheries in Detroit River, with the exception of those carried on by means of a few fykes and "baby" pounds, is prosecuted by the aid of seines about sixty fathoms in length. There are thirty fisheries on the river between Windmill Point at its head and Bar Point at its mouth. They are located both on the American and Canadian shores, and on the islands which occupy the central portion of the river. The most northerly are situated at Isle a la Pêche, at the head of the river. South of this, on the American side, there are two more reaches. On the east shore of Belle Isle there are three fisheries, and on the west shore one. South of Belle Isle there are no more until we have passed the city of Detroit. Off Fort Wayne, on the American side, there are four fisheries, and a little to the northward, opposite the town of Sandwich, on the Canadian side, one. The next five are on the Canadian side, the most northerly being about a mile north of Sandwich. On the west shore of Fighting Island there are five fisheries, and on the east shore of Grassy Island two. On the northeastern shore of Grosse Isle we find three fisheries; at Stony Island, further to the south, one, and at Sugar Island still another. The latter is the most southerly ground on the river. Many of these reaches are located on the mud banks that make off from the shore, but in some places the bottom is sandy and stony. The catch consists of whitefish and pike. A few days before the whitefish appear there is usually a run of herring, and a smaller mesh in the pockets of some of the seines is used for the purpose of taking them.

22. LAKE ERIE.

MOUTH OF THE DETROIT RIVER TO PORT CLINTON.—Along this section of shore fishing is prosecuted almost entirely with pound-nets. Stations extend without interruption from Bar Point, at the mouth of the Detroit River, to Port Clinton. *Between these two points, in 1879,*

there were not less than 425 pound-nets. Each company's nets are set in a line, the outer net being often four or five miles from shore. The fisheries of Toledo extend from Teal Ground to Locust Point.

Off Toussaint, about ten miles west of Port Clinton and three miles from shore, there is a gill-net ground of considerable importance. The bottom here varies greatly, in some portions being rocky and in others muddy or sandy. The water at the outer limit of the ground is about twenty-eight fathoms in depth.

Some seining is prosecuted in and about the mouths of the various rivers along this stretch of shore. At Portage River it is carried on only in winter. A few fyke-nets are set in Portage and Four Rivers as well as in some of the bayous, but the fishery is not important, although considerable quantities of inferior varieties of fish are taken.

PORT CLINTON TO VERMILLION.—The pound-net grounds continue without interruption along this section of shore. The fishing-grounds of Sandusky and vicinity may be divided into four great districts, each partaking of some peculiarity not shared by the others. They are generally spoken of as the Cedar Point fisheries, the bay fisheries, the island fisheries, and the main shore fisheries. The Cedar Point fisheries are the oldest and most important. They begin at Cedar Point, at the entrance of Sandusky Bay, and extend about six miles towards Huron. There are sixty-six nets in this district. Many of the outside nets are five and one-half miles from shore, the nearest being about one-half mile. They are set in from twenty to thirty feet of water, the average depth being perhaps about twenty-eight feet. The shore as well as the bottom of the fishing-ground is sandy. The catch here consists largely of herring, but great quantities of whitefish are also taken.

The bay fisheries are prosecuted not only with pounds but also with fykes and seines, the stations and reaches being scattered along both shores. The water in both the upper and lower bays being shallow, nets having a depth of five to twelve feet only are used.

The main shore fisheries extend from Sugar Bluff to the entrance of Sandusky Bay, the pound-net stations being scattered regularly along the shore. They are set in from twelve to thirty-five feet of water. The bottom is generally clayey. This fishery is noted for the large catch of herring, the next fish in importance being the catfish.

What are known as the island fisheries are situated about North, Middle, and South Bass Islands and Kelley's Island. On the North Bass Island there are but seven nets, though northward from the island there is an extensive whitefish spawning-ground. On the north of the island it is impossible to drive stakes on account of the rocky bottom. At Middle Bass Island there are twelve nets, many of them being set in thirty-five feet of water. The fisheries at South Bass Island are the most important of the group. On the shoals and reefs about the islands there are extensive and important whitefish spawning-grounds. The most productive of them, however, are those north of North Bass Island, in Canadian waters. At Kelley's Island there are twenty-three pounds, and the fishery would be very profitable were it not that vessels run through and destroy the nets. The principal fish taken on these grounds are herring, whitefish, and black bass. The seine-fishing in this locality is quite extensive and important. The principal grounds are located about Willow Point. In Sandusky Bay seine fishing is carried on all winter. The principal grounds are near the mouth of the Sandusky River.

North and northeast of Kelley's Island there are two reefs, which are frequented by sturgeon, and about two hundred gill-nets are set here annually.

The pound-net grounds of Huron extend about five miles east and the same distance west of the mouth of the Huron River. In 1879 seventy-four pounds were located in this district. Five

miles east of Huron there is a small whitefish spawning-ground, but the bottom is very rocky and only one net is located there. The pounds are set in from twenty-two to forty-two feet of water, most of them being from seventy-five rods to three and one-half miles from shore. The "driving bottom" in most portions of the Huron grounds is excellent, the outer portions being better in this respect than the inside grounds. The clay bottom of the lake is covered by layers of sand forming the best kind of "holding ground." The catch at Huron consists chiefly of herring; in fact, these grounds are considered the most favorable for herring fisheries of any on the lake. The general fishery is also very profitable, there never having been a failure since it was begun. The migratory varieties, such as whitefish, are taken only while passing, but herring and blue pike are always present in abundance. Such fish as go towards the head of the lake to spawn sometimes fail to reach that locality, and consequently there is liable to be a failure there, but small quantities, at least, are always caught on the Huron grounds. Very extensive herring spawning-grounds are situated here, and this fact possibly accounts for the extraordinary numbers of this fish which are taken here in autumn.

The Vermillion fishing-grounds occupy but a very small extent of shore, the nets being set at but one station and close together about four miles west of the mouth of Vermillion River. Nets are set in from thirty to forty feet of water, and from two and one-half to three and one-half miles from shore. The bottom is all clay, and very favorable both for driving the stakes and holding them firmly.

VERMILLION TO CONNEAUT.—The most westerly pound-net grounds of this section of shore extend from Vermillion to the mouth of Black River, a distance of about eleven miles. The next station to the eastward, known as the Dover Bay fishery, is about six miles east of Black River. Only twelve pounds are set here in water from twenty to forty feet deep, the inner pounds being about seventy rods from shore, the outer about one and one-fourth miles. The bottom is sandy and the "holding ground" very good. Passing easterly we find the next stations between Onagrin River, near Willoughby, and Grand River, near Painesville. Thirteen nets were used here in 1879. The only other station in this section is situated about three miles east of the mouth of Grand River, where there are four nets. The bottom, as at other points along this shore, is sandy and gravelly.

Between Ashtabula and Conneaut we find important gill-net grounds extending twenty-five miles from shore. In spring the fishermen do not go farther than twelve miles from shore, but in summer they go to the outer limit of the ground, about twenty-five miles distant. Large quantities of whitefish and blue pike are taken on these grounds. The fishermen are well acquainted with the migrations of the different species and follow them from shoal into deep water and *vice versa*.

There are two seining reaches at the mouth of Conneaut Harbor, which are visited for a short time in the spring and in some years a few days in autumn.

CONNEAUT TO BUFFALO.—The fishing-grounds of Erie extend from about eight miles west of the "Head" to the western part of the peninsula encircling Erie Bay and pass in a northeasterly direction, the distance from shore varying from four to fifteen miles according to the season. The greater portion of the fishing is prosecuted in from twelve to eighteen fathoms of water. In the spring the fish come from the westward and the grounds earliest visited are west of the "Head," but the best fishing is always north-northeast of the mouth of the harbor and about ten miles out. No considerable quantity of whitefish is taken within four miles of shore. The abundance of fish on the Erie grounds is thought to be increasing. The largest quantities of whitefish are taken in June and July and in the fall about the middle of October. Later than this, quantities of pike are

taken in small-mesh nets, set three or four miles from shore. Pound-nets are not allowed nearer shore than three miles, so that all fishing is done with gill-nets and hooks.

Many years ago Barcelona was the most important fishing town on Lake Erie, but at present the grounds are almost entirely depleted. The grounds at Dunkirk were also famous for a long time, but very little fishing is prosecuted in that locality at present.

23. LAKE ONTARIO.

There are no important fishing-grounds on the south shore of Lake Ontario between the Niagara River and Port Ontario, and very little fishing is carried on along this shore. The only important grounds are located at the east end of the lake and on the north shore within Canadian limits. There are small and unimportant gill-net grounds at Poultneyville, Fairhaven, Oak Orchard, Wilson, Braddock's Bay, Charlotte, and Cole's Landing, near Oswego, where a limited amount of fishing is carried on, the products of which are principally for local consumption. A few small seines are also employed along this stretch of coast for the same purpose.

At Port Ontario the seining-grounds begin a mile and a half north of Salmon River and extend along the shore towards Sturgeon Point, a distance of about six miles. Outside are located the gill-net grounds, the nets being in from sixty to two hundred feet of water, and from one and a quarter to seven miles from land.

Near Cape Vincent one pound is located, set in about twenty feet of water, and at Bear Point there are two in eighteen feet.

Along the entire shore from Port Ontario to Amherst Island, there are numerous gill-net grounds, famous localities being about the Duck Islands and Torch Islands, Long and Bear Points.

This whole stretch of shore also furnishes suitable grounds for traps and fykes, some localities being particularly suited for bull-head fishing. Southwest of Point Peninsula there is a famous white-fish ground. Traps and fykes are set along the Saint Lawrence River, on the American side, for a considerable distance.

Sacket's Harbor grounds are situated about Black River Bay, Chaumont Bay, and in the lake off Grenadier and Fox Islands, Stony Point, etc. The principal fishery, however, is located at Duck Island, in Canadian waters. These grounds are considered the most profitable on the entire lake.