

Royal Dublin Society.

THE SEA FISHERIES

OF THE

SOUTH & SOUTH-WEST OF IRELAND.

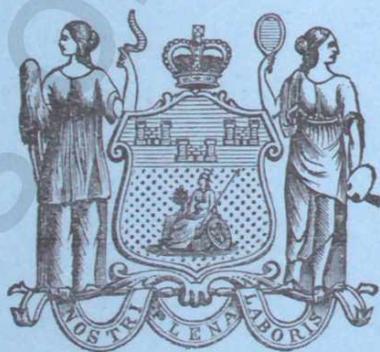
SECOND REPORT

OF

THE FISHERIES COMMITTEE;

Including a Report by

REV. W. S. GREEN, M.A.



DUBLIN:

PUBLISHED BY THE ROYAL DUBLIN SOCIETY,
AT LEINSTER HOUSE.

PRINTED AT THE UNIVERSITY PRESS, BY PONSONBY & WELDRICK.

1888.

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With a Report

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SECOND REPORT

OF THE

FISHERIES COMMITTEE OF THE ROYAL DUBLIN
SOCIETY,

To the Council.

FEBRUARY 6th, 1888.

A FISHERY COMMITTEE, consisting of the following Members of the Royal Dublin Society :—Professor FITZGERALD, Dr. E. PERCEVAL WRIGHT, GREENWOOD PIM, M.A., and Professor A. C. HADDON, was appointed by the Council of the Society, on February 24th, 1887, for the purpose of collecting information about the Sea Fisheries in the south and south-west of Ireland, and suggesting how the Fishing Industry in Ireland could best be promoted.

In order to gain the requisite information, preparatory to arriving at a decision in such matters, two courses are open—the one to publicly solicit evidence in the manner of Government commissions; the other for one individual to collect information on the spot. While the former method has undoubted advantages, your Committee resolved to adopt the latter, owing to the fact of several Royal Commissions having already reported on the subject.

With this in view, the Committee entrusted the duty of collecting and sifting evidence to the Rev. W. S. Green, of

Carrigaline, Co. Cork, a gentleman who has had great experience in marine fishing, and who is intimately acquainted with the coasts of Waterford, Cork, and Kerry.

A preliminary Report from Mr. Green was presented by the Committee, at the Stated Meeting of the Royal Dublin Society, held on June 2nd, 1887, and was printed in the Report of the Council (pages 11-15). This Report referred to the Baroness Burdett-Coutts' perpetual Loan Fund to the Cape Clear fishermen, and to the Baltimore Industrial Piscatorial School, with suggestions as to the manner in which the school could be best assisted, and the education of the fisher-boys improved.

The present Report deals—(1) with the more important fish and their relative abundance on the south coast; (2) with the local and distant markets, the fluctuations of prices, and the question of transport; (3) suggestions as to the best means of improving the fishing industry. It is shown that it is not desirable, in most instances, to increase the number of boats or, at first, to introduce a better class of boats, or even to construct harbours, but to facilitate the means of transport, so that the fish obtained by the existing machinery may be cheaply and rapidly conveyed to the home and foreign markets. Several short extensions of railways would largely effect this purpose. The introduction of well-vessels for the conveyance of live cod and ling to the market would result in higher prices being obtained. The conveyance of lobsters from the south of Ireland in well-boats would appear to be already a commercial success.

In order to secure a good average price for fish, depôts and public markets should be established at suitable spots, where fish could be preserved in a fresh condition, or cured, and from which fish could always be procured by wholesale or retail inland consumers. The bad effects of gluts of the market, alternating with times when fish cannot be obtained, would thus be obviated.

The enormous consumption of cured fish in Ireland, of which practically the whole is supplied from Norway, Scotland, and Newfoundland, is a matter which deserves close attention. Many attempts have been made in different places along the coast of Ireland to establish fish-curing establishments, but from various causes they have one and all failed. By collecting information upon the causes of these failures, it is very probable that most of the dangers could be avoided which have beset the carrying out of such enterprises. The germ of a new departure in this direction is alluded to on p. 25 of Mr. Green's Report.

One great difficulty in fish-curing in this country is the lack of uniformity in quality, and it is probably this cause, as much as any other, which has prevented the development of local industries. An obvious remedy for this is the appointment of Inspectors to testify, by a brand, to the quality of the cured fish. The Herring Brand has had an effect in promoting the sale of the Scotch herrings, and there can be but little doubt that a beneficial result would accrue to Ireland were a brand in use here for mackerel and other fish. In a few years the fees would help to pay for the cost of inspecting and branding, as is the case in Scotland.

The Committee express no opinion concerning the re-establishment of bounties.

Mr. Green's note of warning concerning the "copers" is well-timed: this unmitigated curse should not be allowed to gain a foothold in our fisheries. The immeasurable evil done by these traffickers in the North Sea is only too well known.

Lastly, the Committee desires to record its firm conviction as to the necessity for enlarging the powers of the Irish Fishery Board on the same lines as that of the Scotch Fishery Board. There is a great deal to be done of local importance, even apart from the more general problems of the natural history of fishes. Two members of this Committee were associated, in 1885 and 1886, with Mr. Green, on a Com-

mittee for investigating the marine zoology of the southwest of Ireland. In the second cruise of the *Lord Bandon* (1886) a most important fishing-ground was accidentally discovered off the Skelligs, and the systematic exploration of our coasts would doubtless reveal other valuable fishing-grounds, all of which should be accurately mapped.

The Committee desire to express their indebtedness to Mr. Green for the great trouble he has taken, and the energy he has displayed, in collecting the information upon which his report is based. There are few persons, with the requisite special knowledge, who would have given so much valuable time gratuitously to such a laborious task.

REPORT ON THE SEA FISHERIES
OF THE
SOUTH AND SOUTH-WEST OF IRELAND.

By REV. W. S. GREEN, M.A.

—◆—
I.—SUPPLY.

FOR hundreds of years the abundance of fish frequenting the Irish coast has been well-known. The Irish fisheries have been the subject of many treaties, and at various times they have been successfully worked.

Our most important sea fisheries are those of mackerel, herring, cod, ling, and hake.

Mackerel.—The mackerel approach the south-west corner of Ireland early in March, unless retarded by easterly winds: in the latter case they arrive after the first south-westerly breeze and consequent rise in temperature, to which fish are very sensitive; they also seem to be attracted by the arrival or development of vast swarms of bright-red copepods, on which they feed. The nets, as they are taken from the water, are often covered with the "red stuff," as the fishermen call it, and they say that when much of it is going the mackerel taken quickly decompose.*

At first the fish keep 15 to 30 miles from land, but as April and May advance they come quite close in. During these early months they take no bait, and can only be caught in drift-nets. In the height of the season the take per boat might average about 4000 fish, varying greatly, from 1000 to occasionally 10,000. The fish are very large, from 2½ to 3 lbs.

* See Appendix A, p. 37.

each, and fetch nearly twice the price in Billingsgate of the mackerel caught on the English coast. After June their habits change; the schools appear to break up; they accept bait, they seem to haul off the coast, and their place is afterwards filled by schools of smaller autumn mackerel. During the autumn of 1887 immense schools of these mackerel were all round the coast, but were fished for by only a few boats. In one haul, in Valentia Harbour, 17,000 were taken; they were good-sized fish, those I saw being about two-thirds the size of the spring fish. They were sold for 2s. 6d. and 3s. per hundred.

Herring.—Soon after the mackerel immense schools of herring make their appearance; but owing to the men being employed in mackerel fishing, and the markets being well stocked with the more valuable fish, their coming is more a matter of vexation, at not being able to utilize the herring, than of profit to anyone concerned. True, they bring a number of Scotch fishing-boats and buyers to the coast in the season when the mackerel fishing gets slack; so in circulating money and giving employment the herring fishery indirectly benefits our coast population.

Herring caught in May, June, and July, are a rich, oily fish, good when eaten fresh, but not suitable for curing. There is abundant proof that herrings frequent the coast all the year round; the winter herrings are not thought so good for eating fresh, but, no doubt, at certain seasons of the year great numbers could be taken in the condition most favourable for curing. Attempts have been made to utilize these great schools of herring in the manufacture of oil and manure; but a company started for the purpose at Kinsale failed. The price they could pay for the herrings would not make it worth the fishermen's while to fish. In July the herring-boats leave our south-west coasts for the Irish Sea—not because the shoals of herring have decreased, but because the fish can then be caught nearer to the markets and curing establishments.

Pilchard.—Pilchards have been taken on the south-west coast in vast numbers, but are not valued by the coast population, who do not care to fish for them, believing that the oil from these fish rots their nets. For about the last ten years, however, pilchards seem to have almost deserted the coast.

Sprat.—The sprat fishery, which for the last few years had shown a falling-off, has this year resumed its importance.

The long continuance of settled weather evidently induced the schools to accumulate on the coast and far up the estuaries. In October and November Cork Harbour was full of sprats, and all along the coast they were taken in such quantities that the price fell to 3*d.* per firkin, and large quantities were wasted for lack of buyers.

Ling.—The ling fishery ought to be of the greatest importance on the Irish coast. The amount of ling frequenting our seas is, I think, quite under-estimated.

Cod and ling are fished all along the coast, by means of row-boats, or by the 30-ton boats, which are for a portion of the year engaged in the mackerel fishery, and on the west coast by canvas canoes. This fishery lasts on the west coast from October to July, a longer series of months than any other; and, I believe, if it were conducted in the same systematic manner as the mackerel fishery, that the actual weight of fish captured might be equal or greater, it would deteriorate less in transit, and be more valuable for curing. Ling are caught by long lines or spillers, in 40 to 50 fathoms. To reach this depth the boats belonging to such places as Dungarvan, Youghal, and Ballycotton have to go distances of 12 to 40 miles, whereas off the west coast, near Valentia and Dingle, the canoes lay their spillers within two miles of the land. Ling seem to frequent roughish ground: the deeper the water, the greater the amount and size of the fish. The quantity of ling and other fish actually caught will be made known when the statistics now being collected by the coast-guards are published in the report of Her Majesty's Inspector of Fisheries. For the present purpose it is enough to say that a mere fraction of what might be taken are actually captured by the small boats, upon which the greater part of the fishery devolves.

The ling frequenting the Irish coast are second to none in quality and size. With regard to the latter the following may be sufficient:—In the summer of 1886, while engaged in a dredging expedition, under the auspices of the Royal Irish Academy, we touched on certain ground which, from the amount of living creatures obtained in one haul of the trawl, we argued, ought to prove a first-rate fishing-ground. Accordingly, while on a cruise during the past summer, for the purpose of acquiring information for this Report, I determined to test it. We shot a short spiller, consisting of 280 hooks, baited as follows:—100 hooks with lug-worms, 180 hooks with mackerel and conger. At 4 P. M. the line was laid; in

less than an hour it was hauled. On the 100 lug-baited hooks there was nothing except six Bergylts (*Sebastes Norvegicus*), a beautiful but worthless little fish. On the rest of the line every mackerel bait had been accepted. There was a fish on every fourth hook; but, though the gear was both new and strong, half the fish were lost by the snoods breaking before the fish came within the reach of the gaff. Our take consisted of cod, ling, tusk, ray, and a few dog-fish. The ling and ray were unusually large: three of the former measured over 5 feet 6 inches each in length.

The most important ling fishery in the British Islands is that off the north of Scotland, Shetland ling being celebrated. In the "Fish Trades' Gazette" for May 7, 1887, special mention is made of the great size of some ling taken in Orkney, "one measured 5 feet 6 inches in length." It is not likely that we caught specially large fish; but, judging from our samples, I think it probable that a fully equipped boat, with a line of 3000 hooks, might catch 10 tons of fish in a day in this locality. All this ground is as yet unfished.

Cod.—In speaking of the long-line fishery I give cod the second place—1st, because they are not so numerous as ling. Their proportions may be judged from extracts of reports from widely-separated stations. At Ballycotton, Co. Cork, a boat with a crew of 6 men would take in a good night's fishing in the month of March—about 2 score cod, 6 score ling, 2 score haddock, 4 score ray, and other fish. At Port Magee, Co. Kerry, the proportions in same month are about the same. In some places cod seem more plentiful, in others haddock; but a general view of returns before me would give as a result, that out of every 100 fish taken in 40 fathoms, and deeper, we might expect 40 ling, 20 cod, 20 ray, 10 haddock, and 10 of other sorts, including conger eels, occasionally turbot, and, on the west coast, tusk.

Secondly, cod are out of season for some time within the months when this fishery can be carried on. The height of the spawning is about the end of March, and they are then out of condition, but in June and July they begin to recover. We found, in our experimental "shot" off the west coast in the end of June, two cod in prime condition, while two others were slack and poor.

Hake.—Hake visit our coast in vast numbers, and at a season when full advantage can be taken of the fishery. Dungarvan, in the times gone by (before 1847), was famous for its hake fishing, but the present generation there have

given it up, and say that the hake have been destroyed by the herring-nets. Great numbers of young hake and other fish are, no doubt, killed in the herring-nets, owing to their being sunk deep, not set, like mackerel-nets, on the surface of the sea. All the same, the hake are not banished, for the Kinsale boats were killing from six to eight hundred per boat each night before last Christmas, and during the past autumn hake were taken in such quantities all along the south coast that they were sold for 2s. and 3s. per score.* The hake on the south coast are a particularly good fish, usually of medium size. To the westward very large hake are often taken, likewise of excellent quality, and not like the huge, worthless creatures sometimes taken by trawlers in the Irish Sea. Hake come close in, which facilitates the fishing; they even enter the harbours. On one occasion I killed 30 hake, between four and seven p.m., in Queenstown Harbour.

With regard to the valuable food fishes, mackerel, herring, and ling, I have shown that the supply is prodigious, and cod and haddock are in sufficient numbers to meet all the demands of the country. We have yet to consider the fish which remain, such as sole, turbot, and plaice.

Sole, Plaice, and Turbot.—Trawling is carried on in all the bays along the coast from Dungarvan to the Blaskets, to the eastward of Cape Clear; principally by hookers of from 10 to 30 tons, using for the most part pole and otter trawls. The grounds are of limited extent, chiefly narrow strips of sand between patches of rocky ground. West of the Cape we find such large bays as Dunmanus, Bantry, and Dingle Bays, worked by beam trawlers of about 50 tons. There is also some trawling in Kenmare River and Ballinskelligs Bay.

The supply of sole and plaice varies with different seasons, but in the autumn and early spring months there still seems to be an abundance of fish, and there are certain wise by-laws in force restricting the trawlers from overworking shallow bays. I have been trawling on the coast alluded to every year for twenty years, and so far as my experience goes I do not think the pole and otter trawls, with light-leaded foot-rope and large-mesh nets, do any harm to the ground frequented by them from time immemorial. But I do believe that the heavy foot-rope of the large beam trawl is a powerful engine for grinding young

* A score means 21 fish.

fry, molluscs, and worms to death, while the small mesh, $1\frac{1}{4}$ inch square, ensures the capture or destruction of the young fish which would be the supply for the next season.*

Sixteen years ago I remember killing 28 sole and 5 turbot in one scrape of a small trawl in Ballinskelligs Bay. Later experiences have proved a great diminution, chiefly in the case of turbot. The area is limited; the water is shallow; both the food supply and young fish have, perhaps, suffered from the large beam trawlers.† Out in the wide areas of deep water restrictions as to mesh or limits fished would only be mischievous. But I think the limitations of Her Majesty's Inspectors of Fisheries have been wisely planned. They certainly have not erred by over-interference.

The wide areas of Dingle Bay have been trawled for many years by large beam trawlers. I saw some new boats there this year, purchased in Yarmouth, fine Ketch-rigged vessels, and owned by residents in Dingle, but some of the fishermen told me that they were just about starting for Killybegs to try the recently proved trawling grounds of Donegal Bay. In the spring of this year English trawlers worked in Dunmanus Bay; but as a rule this fishery has been left to local enterprise. There seems always to have been certain months in which the fishing has been slack; in other months the fishing on the whole seems to have been well maintained; but with regard to such important fish as sole and turbot, it is much to be desired that their life history should be better understood, and this can never be until competent observers are induced to devote years to such investigation.

Plaice, sole, and turbot migrate within certain limits, and sometimes return in abundance to their former haunts, without regard to the theories which had been elaborated meantime to account for their disappearance.

Queenstown Harbour abounds with trawling grounds, and at the entrance is a celebrated turbot-bank. A small area on this bank is prohibited for trawlers, but day after day, all the year round, dozens of small 10 to 15 ton trawlers may be seen working the other grounds over and over again. Plaice and sole come in at their appointed times as usual, and neither steamers nor trawlers seem to affect them. The

* See Appendix C, p. 38.

† This year, however, proved a most wonderfully rich one for all kinds of fish on the coast; so it is possible that other causes than trawling may have effected the diminutions of past years.

trawls used are beam trawls, but not provided with the great ground-rope or small-meshed nets of the large trawlers. The turbot-bank is only fished by spillers, and of late years the fishing had so fallen off that the chances of getting a turbot scarcely compensated for the expenditure of bait and trouble. This falling-off has been accounted for by the number of great ocean liners and hosts of smaller steamers which disturb the waters, also by the ejection of mud from hopper barges, and lastly by the periodical heavy firing from Forts Camden and Carlisle, their target being always moored on or close to the turbot-bank. In spite of all these theories accounting for the disappearance of fish, the turbot seem this year to have returned to their former haunts, one amateur party having killed, on the 16th July last, in the one day's fishing, no less than 10 turbot, weighing in all 108 pounds.

The high temperature of the sea this season, compared with that of the last decade, may have something to say to these migrations.

Lobster and Crab.—Lobsters are taken in abundance all round the coast, and are brought up by well-boats, which come for them from Southampton. Crabs are much more numerous: they are of smaller size than those often seen in south of England markets. No use is made of them. Lobsters, crayfish, and prawns are the only crustaceans for which there is any demand.

Oysters.—The oyster-beds of Cork Harbour and Kenmare River have long been celebrated, but beds, formerly good, have been silted up by alterations of currents and other causes. Some of the newly-made beds have succeeded; but a systematic periodic planting is necessary to maintain the supply, the fattening-beds, and not the breeding-beds, being alone attended to.

Numerous details have been omitted; but what has been said will be, I trust, sufficient to show that the supply of fish on the Irish coast is practically unlimited. We have now to look at the other side of the question.

II.—THE DEMAND.

To properly estimate the demand we must take into account two classes of markets—the local and the distant. The local consumption of fresh fish is extremely limited. There is no wholesale market for fish in Cork; and men with donkey carts—“jolters,” as they are called—find the practice of hawking fish from house to house and village to village, within a few miles of the sea, but a poor business. The consumption of salt fish and dried fish is much greater. Cod, ling, hake, mackerel, scad, bream, gurnard, and conger are caught and dried for winter use by the coast fishermen. On some of the headlands and islands this is done on such a large scale that a regular, though limited, trade is carried on. Dursey Island, one of the most remote places in the south-west, will afford a good illustration. This island (about three miles long) is situated off the end of the long promontory which separates Bantry Bay from the Kenmare River. From the landing-place in Dursey Sound I visited three little hamlets, into which all the habitations have been grouped. Much of the island consists of heath-covered moorland; but, wherever cultivation is possible, small fields are tilled. The houses are, for the most part, roofed with great slabs of stone, which make excellent drying-places for the fish, with which they were thickly covered, as was also every available slab of bare rock in the vicinity. Some of these fish are for home consumption, others are for trade, and are taken in boat-loads up the Kenmare River, and to various places on the coast, for sale. Some of the Dursey men came to Ballinskelligs Bay when we were there last summer, camped on the beach, sold the dried mackerel to all comers, and then returned to their island home. Often they encounter great dangers in prosecuting their trade. A friend of mine lent a cart to them, some time since, to enable them to convey their boat from the stormy coast, when they had disposed of their cargo, to the calmer waters of the Kenmare River, that so they might get back to their homes. These men, and many others on the headlands and islands, are doing their best to make the most of the harvest of the sea, and to meet the wants of the coast population. In some places these cured fish are carted inland on fair-days, and are bought freely, because they can be retailed at a lower price than the im-

ported fish. But, from a conversation I had with an enterprising curer in one of the coast villages, I gathered that he could not afford to sell cured fish at the present *wholesale* prices of imported fish. This is possibly owing to the thing being done on too limited a scale; but it is also partly due to the difficulty of procuring skilled splitters who can do their work neat enough for the market. At the same time, such curers never purchase their fish except when there is a glut and prices are at their very lowest.

In 1846, when curing stations were established by the aid of the Reproductive Loan Fund, they seemed to pay very well. From various local causes some were failures; but the Commissioners reported "that on many of these separate transactions the sales effected by our agents showed a profit of from 50 to 80 per cent. on the purchase, cure, and sale of fish, independent of the cost of the establishment.

The demand for salt fish in Ireland is greater in proportion to the population than that in England or Scotland; but it is met by importing Norway cod, Scotch herrings, and Shetland ling. The amount of cured fish imported at nine Irish seaports is given, in the appendix to Her Majesty's Inspector's Report of Irish Fisheries for 1886, as 1802 tons, 29 cwt., for one year; but when we observe that such important seaports as Belfast and Waterford are not included, it is easy to see that such figures fall very short of a full estimate of such importations. From other returns, I believe we may accept as a fact that about £200,000 worth of cured fish is imported each year. So much for the demand in Ireland.

The French markets are practically closed to all except the French fishermen. Usually the French boats on our coast salt the mackerel down in bulk; and when a cargo is complete, sail with it to France, and sell the slightly salted mackerel as fresh fish. During the past spring, however, they adopted the plan of sending mackerel packed in ice; and I have good authority for stating that £800 profit was made on three cargoes thus run during the season of Lent. In some cases fish were bought by the Frenchmen from the Irish boats to complete their cargoes. Quite recently a brisk demand for Irish-cured mackerel has been found in America.

All other markets, however, sink into insignificance before Billingsgate, Birmingham, and Liverpool; and the demand in these is the most important for our present consideration. The mackerel fishery commenced about the 20th of March, 1887, and some early takes of fish met with high prices:

one boat, that landed 5000 mackerel during the last week in March, netted for the one take £157 5s. These prices rapidly declined. On April 1st Irish mackerel, bought at the boats at from 3s. to 4s. per score,* were selling in Billingsgate at 9s. per score. By the middle of that month the London price had fallen to 5s. There came a temporary rise in the first week in May, but prices quickly fell to a range between 2s. 6d. to 4s. per score. In April, when fish were bought in Bantry Bay for 2s. per score, they sold in Billingsgate for about 7s. per score, leaving 5s. per score for carriage and profits to dealers. When, however, the prices in Billingsgate fell to 3s., and less, it is easy to see there could be little or no profit to anyone concerned save the railway companies. The supply thus came to exceed the demand.

Next to Billingsgate, Birmingham is the most important market for Irish supplies. In the early months prices there ranged about 1s. per score dearer for Irish mackerel than in Billingsgate; but, by May 18th, we find the report:—"Irish mackerel very plentiful, and quite a drug in the market": 2s. to 2s. 6d. per score.

The flood of mackerel which poured into England in the month of May may be estimated from the return of one port. At New Milford, £84,000 worth of Irish fish entered the port during the month of May, showing an increase on same month in 1886, of no less than £22,000 worth.

Up to the present year mackerel found their way to London only by rail; but this year seven steamers went direct from Kinsale to London with iced mackerel. It is said that the water-borne fish arrived in better condition than that which went by rail, and the cost of transport was only 15s. per ton, against 80s. by land.

Hitherto the great idea for the improvement of Irish sea fisheries has been to multiply boats. Loans have been charitably and wisely administered; but let us face the necessary consequence. This year there was an unusually large number of boats engaged in the fishery, and though the takes per boat were often below the average, the amount captured was so large as to threaten a reduction of prices, which would ruin or impoverish all concerned.†

* In the trade a hundred mackerel is supposed to mean 120 fish, and a score = 21; in practice, however, a hundred now means 42 "casts," of three fish each, six extra fish thus going to the buyer.

† It is often difficult to find out from the Irish fishermen whether their work

A very intelligent skipper, who was offered full security if he would accept a loan, and provide himself with a boat, told me he would not take the risk under the present prospects of prices. In Scotland, no less than 1000 boats were laid up during the past season, the low prices prevalent not being considered sufficiently remunerative for the cost of fitting out.

With regard to the herring fishery on the south coast, the market difficulties seem greater, and it can only be rendered remunerative by the boats abstaining from fishing every now and again to let prices rise. A Scotch skipper told me that this fishery did not really pay at all, but it kept them going, and helped to cover expenses in the slackest months of the year.

The difference between the prices of living and dead cod in Billingsgate and other markets is very great, cod brought alive in well-boats, fetching often 140s. per score, while from 60s. to 30s. is the value of dead fish on the same day. The south of Ireland is most favourably situated for sending fish alive to the English ports, and getting the higher price, but nothing of the sort is at present attempted.*

About the year 1800, The Royal Dublin Society appointed a Mr. Fraser to report on the fisheries of the county of Waterford. A revenue cruiser was placed at his disposal, and experiments made on the fishing-grounds known as the "Nymph Bank,"† situated off the coast of Waterford and

is paying them or not—not because of their reticence on the subject, but because they look to the gross earnings and do not calculate out the wages, interest on capital, &c. One thing however is clear, that they are able to live better and have more nourishing food than any labourer or small farmer in the country; and though their work may be more risky it is not really so hard, and is more interesting, than that of many others who must live by manual labour. See Appendix B, p. 38.

* The well-vessels which sail from Great Grimsby to fish the banks of the North Sea are from 70 to over 100 tons register, and draw about 11 feet of water. Fore and aft are two cabins for the captain and crew, and amidships a compartment strongly built of oak forms a well, to which the sea water has free access by holes bored through the vessel's sides and bottom. In this well a number of fish are brought to port alive—the ling all tied by the tails, the cod swimming about free. On reaching port the live fish are transferred to great chests or trunks, which float in the dock, and through which the water circulates freely.

These cod-smacks remain at sea from one to three weeks. The cost of one fully equipped is £1600. About 120 of them sail from Great Grimsby alone. During the past autumn the Norwegian well-boats brought 6000 cod alive from Iceland to Bergen.

† The eastern portion of this bank is clean ground, and worked by the Dunmore, and at certain seasons by the Ringsend trawlers; its extension westwards as a *bank* is rather mythical; the old charts give it much prominence, but the new Admiralty charts show nothing to the south of the Cork coast of

Cork, at a distance of 12 to 15 leagues from the land. These experiments were so satisfactory, that the Government encouraged the formation of a company known as the "Waterford Nymph Bank Company." The fishing proved most successful, and two well-vessels sailed to Billingsgate, on one occasion taking 35 score of live fish, while other cargoes of cured fish went at the same time. Everything seemed to be most promising; but the Company rapidly came to grief, owing, according to Mr. Fraser's account, to the party struggles which took place amongst its Managing Committee.*

Ling does not usually seem to be quoted in Billingsgate; but in Birmingham and many other English markets partly supplied from Ireland, ling ranges in price from 1s. 6d. to 2s. 6d. each, while at Great Grimsby, live ling fetched from 4s. to 7s. each during the whole spring of this year. It pays fishermen on the Irish coast to prosecute this fishery when they can get 9d. apiece for the fish, and on the west coast, I think, properly equipped boats could make it pay if they were certain of getting 6d. There ought to be ample margin for profit between 6d. to 9d. on the coast, and 1s. 6d. to 2s. in England, but the high railway rates absorb it all. A Kinsale dealer informed me that it costs him about 9d. a-head to place his ling in the Dublin market. At Kinsale there is a railway; but what must be the loss to the Ballycotton fishermen, who must, in despatching their fish to England, pay 15s. per ton cartage between Ballycotton and Cork. At Kinsale 13 first-class boats carry on the fishing in the early spring. Ballycotton, which owns but three first-class boats, carries on the fishing by means of large open whale-boats. A new fishing-pier has been built there, at a cost of £20,500; but unless the means of getting fish to market is improved, the pier alone is not likely to lead to the development of the place. At Glandore and Castletownsend the fishing is prosecuted chiefly by small boats, which do not venture sufficiently far out to sea. Some large Dublin boats visited the latter harbour this spring, and, making it a base of operations, worked the ling fishing most successfully, salt-

the nature of a bank, except the small Labadie bank, 60 miles away. I have several times been on what the county of Cork fishermen call the "Nymph Bank," the depth ranging from 45 to 50 fathoms, with certain patches rich in animal life.

* See also "The Sea Fisheries of Ireland," by John A. Blake, Esq., M.P., 1868.

ing down and taking with them full cargoes. The Cape boats also work the grounds off Bantry Bay. Next we come to the region of canvas canoes, by which the fishing is done on the west coast. All the fish thus caught, and not needed for home consumption, finds its way over the railways, *viâ* Cork and Dublin, to the English markets. Considering the prices which might be obtained if these fish could be landed in Liverpool, Milford, or Plymouth, *alive*, we can see how important it is that the well-boat system should be established in connexion with the cod and ling fishing.

Ray, not valued as food in this country, meets with a large sale in all English markets, fetching a price nearly equal to that of ling. Hake, on the contrary, is much prized, and considered very good eating in the south of Ireland, whereas it is only lately coming into notice in Dublin and the more distant English markets, where it fetches a wholesale price of about 15s. to 24s. per score.

III.—THE MEANS, EXISTING OR POSSIBLE, BY WHICH THE SUPPLY CAN BEST BE AVAILED OF AND THE DEMAND INCREASED.

From what has been said it is evident that, although the seas all round the British Islands abound with fish, no portion of them present so rich a mine of wealth as those seas off the south and west coasts of Ireland. It might therefore be expected that these same coasts should present us with the greatest activity in all things connected with the fishing industry. This, however, has not been the case. The harvest of the sea is, indeed, gathered in, but it is chiefly by Manx, Scotch, English, and Frenchmen, and until lately the Irish fishermen were merely picking up handfulls where tons weight were being taken by the strangers. At last the time came when the men in Kinsale and near Cape Clear awoke to the facts of the case. Resolute efforts were made by the men themselves to obtain suitable boats for the fishing. These efforts have been fostered by the assistance afforded by Her Majesty's Inspectors of Fisheries in their administration of the "Irish Reproductive Loan Fund" and "The Sea Coast Fund;" and, in the case of the Cape Clear district, by the munificence of the Baroness Burdett-Coutts. This revival in fishing dates from about 25 years ago.

To show how far behindhand, however, the state of Ireland

still is, I place three Scotch fishing ports opposite the three chief centres of south Irish fishing activity, and the numbers of boats owned in the respective places will speak for themselves :—

Scotch Ports.	First-class Boats.	Irish Ports.	Boats.
Buckie,	640	Queenstown, ..	77
Anstruther, ..	607	Kinsale,	45
Wick,	399	Skibbereen, ..	91

In the above table the case for the Irish ports is considerably over-stated in this way, that owing to the want of accurate classification in the Irish fishery reports, all boats engaged solely in fishing are included, many being row-boats, while from the Scotch report I have selected only those which are of 30 feet keel and upwards, *i. e.* boats of more than 20 tons. In the case of Queenstown only 10 out of the 77 are first-class boats.

The total number of boats exclusively engaged in fishing in Ireland, including small boats and first-class fishing vessels, seems to be 1478, while Scotland owns no less than 5175 fishing vessels of the 1st class alone; and if we include in our comparison, as in the case of Ireland, small boats as well, we find something over 15,000 boats engaged in fishing.

There are many reasons for this great discrepancy, some of which, being based on natural conditions, are difficult to face. The first is, I fear, of an ethnological character. Scotchmen and Irishmen differ widely in their ways of looking at life; and though both have striking virtues peculiarly their own, the self-reliant nature of the Scotchmen is an important help in the development of anything of a business undertaking. Anyone who reads the story of how Scotch skippers and crews combined, without any external help, to tax themselves sixpence a-week, and thus build the harbour of St. Monance, at a cost of £18,000, will see this trait brought out to a remarkable extent.

The east coast of Great Britain, being for the greater part of the year a weather shore, is also favourable for the development of nautical habits and the prosecution of fishing; and the nearness of these coasts to the great markets of England and the Continent gives them a very decided advantage in the fish trade.

When we come to consider how our great ocean harvest can be reaped, to the best advantage to our own people we must face the above disadvantages, and see how each can be reduced. The constant looking for some social change, and the distraction of mind thus caused has been fatal to many of the collateral industries of the Irish fisheries. It has not affected the fishermen themselves so deeply, but ship- and boat-building has practically been made impossible* in Cork Harbour, where once it flourished.

Education will, it is to be hoped, show the short-sightedness of such conduct, and the training of boys to those callings in such places as the Baltimore Fishing School will, probably, make them more business-like, and give them deeper interests in their work in life. The local revival of the fishing industry shows that we have some self-reliant men among us, and the Irish deep-sea fishermen are acknowledged to be the most daring. Such is the material to work with.

From the prevailing west winds the east coast of England is sheltered, and, therefore, seafaring is safe, except in occasional periods of easterly gales. On the west of Ireland the reverse is the case. For months no ordinary fishing-boat can leave shelter, while the great seas of the Atlantic roll in before westerly gales. Safe harbours are, however, numerous on the south and part of the west. Few coasts in the world are so well provided by nature in this respect, and a sum of £250,000, was recently intrusted to the Board of Works out of the "Irish Church Fund," for the building of harbours, piers, &c.†

* A case arising out of the building of fishing-boats at Passage West, which came before the Recorder of Cork in October last, will illustrate this. The boats built were on lines furnished by the designer of the "Thistle," and are the finest on the coast. The cost of building them was, however, ruinous.

† Doctor Sullivan, President of the Queen's College, Cork, in his evidence (question 580) in the Report of Commission on Irish Industries, 1885, remarks that grants to Irish fisheries are "given in a haphazard kind of way." So long as no Fishery Board exists, as in Scotland, this will be true.

Railway Extension.

As I have already remarked, the prevailing idea in the minds of those interested in developing the fishing industry seems to be to provide facilities for the multiplication of boats; and piers have been built at great cost, to enable men to keep large boats, in places where before they could only keep small ones. But taking a broad view of the coasts under consideration, we must see that owing to their being remarkably well supplied with safe harbours, there are other ways in which money could be more profitably expended.

The third disadvantage, I mentioned when comparing the Irish and Scotch fisheries, was the distance of the Irish coast from the chief markets. To reduce this disadvantage to a minimum, would be far more important than multiplying boat harbours and encouraging the landing of vast quantities of fish, while the means of transit remains so imperfect that the mere catching of fish is an unprofitable business. To reduce the cost of transport between the fisherman and the market is, beyond all other questions, the most important for the south of Ireland fisheries.

Take, for instance, the case of Ballycotton. A large number of men there live solely by fishing. A small pier has existed there for many years, and gives sufficient shelter for a couple of hookers and the large whale-boats which are employed in the cod, ling, and hake fishery. Within the last twelve months a fine pier has been completed, sheltered by a breakwater, at a cost of £20,500. The little harbour thus formed will afford shelter for a number of first-class boats. Three only are owned in Ballycotton; but I believe a fourth is to be purchased. It is not likely that the pier will be much used for landing large quantities of fish, owing to the fact that it is eight miles distant from the nearest railway; and the cost of carting fish to Cork, through which port the bulk of it finds its way to England, is 15s. per ton. £20,500 has thus been spent without any commensurate prospects of advantage, unless eight miles of railway are also made.

If the Great Southern and Western Railway Co. were to construct this branch-line, it would make the present expenditure remunerative, and ensure the success of at least one undertaking. The present harbour is likely to fill up with sand; but from its small area and its nearness to the ap-

pliances kept for deepening Cork river, it could easily be dredged out, if money were forthcoming. The money would come if there was any trade through the place; but without a railway nothing of this sort can be expected. This has been a remarkably good season for hake and winter herrings, but the Ballycotton fishermen are landing the bulk of their fish at Queenstown or Youghal, and not at their own pier.

Persons on the coast are always ready to agitate for these piers being built, because the immediate expenditure of money in labour benefits the place for the time being; but while a wise expenditure might be permanently beneficial, this kind of expenditure is only waste.

Ardmore, too, is a bay in which a similar pier may be built; but with Youghal Harbour and its railway only five miles distant, the advantages to the Ardmore people would seem hardly commensurate with the very large sum which should be spent to make anything like a safe harbour in such an open bay. A small breakwater to protect the boat-creek would, however, be an advantage.

As the conditions of the fishery are not always such as to induce steamers to ply specially for the transport of fish, we are compelled to look upon the railways as an essential factor in fishery development; and as the cost of getting the fish to the railway is at present often very great, anything which could lessen this drain on the profits, and place the money spent on carting, to the credit of the fisherman, fish-dealer, or consumer, would prove a great stimulus to the fishery; and it is a well-known fact that the carters never lose by improved facilities for trade.

In the following table I put forward a few suggestions for railway extension, in order of importance and feasibility combined:—

1. Ballycotton to Mogeley, about seven miles.
2. Connexion at Cork of Skibbereen and Bantry Railway with Great Southern and Western Railway.
3. Kinsale Railway Station to entrance of harbour, where a pier should be built.
4. Baltimore Harbour
5. Castletownsend Harbour
6. Glandore Harbour
7. Cahirciveen to Killorglin.
8. Dingle to Great Southern and Western Railway near Tralee.
9. Bantry Station to harbour.

1. I have already entered into details concerning the case of Ballycotton.

2. There are several projects for connecting these two lines of railway. One is, to continue the Muskerry light railway as a tramway through the streets of Cork. At present the chief difficulty seems to lie in the opposition on the part of the Corporation of Cork to anything like goods traffic being conducted on such a line. The difference of gauge is also a serious drawback, and in any railway extensions should be avoided when at all possible.

3. The Railway Station at Kinsale is about a mile from the pier, and the approach to it is by a very steep hill.

The quays are a long way from the entrance of the harbour, so that with light winds and a contrary tide much time is lost by boats bringing in cargoes or leaving again for the fishing-ground. A pier near the entrance would facilitate matters, and a gradient could thus be found by which the fish-trucks could descend to the sea-level.

4. Baltimore, now thoroughly established as a fishing port, is about nine miles from a railway, and no great engineering difficulties in the way.

5. Castletownsend Harbour is a favourite resort of the Scotch and Manx fishing-boats; but it is badly in want of a leading light, it being very difficult to make off the entrance at night.

6. Union Hall, in Glandore Harbour, is only two miles from Castletownsend. The two could easily be linked together with Skibbereen. At present the cost of carting fish to the railway is about 7s. 6d. per ton.

7. This line means simply a utilization of the splendid harbour of Valentia.

8. Dingle, a most important fishing station, maintaining a fleet of large-beam trawlers and several mackerel boats, is heavily handicapped by its distance from a railway. At present the fish are carted to the G. S. & Western Railway at a cost of £1 per ton. No fish but sole and other valuable fish could stand this expense. In the mackerel season the buyers bring their steamers. On May 15th last two steamers arrived at Billingsgate, one direct from Dingle, and one from Kinsale. The Dingle fish were in the best condition, and fetched 3s. per score.

9. This, though last, is very important, owing to the fact that the Berehaven fish must come by this route.

If money to help the construction of such lines of railway

was forthcoming, any subsidies granted should be conditional on favourable rates being ensured for the transport of fish.

I am quite aware that the above suggestions would require a considerable outlay; but in each case there would be a large return in various kinds of traffic, in addition to the advantages to the fish trade; the whole country would be benefitted, and remote districts opened up.

When I am asked, therefore, to say how I think the fishing industry could best be improved, I do not hesitate to place improved means of transport foremost. Instead of building harbours on a coast already wonderfully well provided in this respect, I would say—for the present, at all events—spend all available money on railway extension, or in some way reducing the charges between the fisherman and the market.*

Fish Curing.—On looking over the last Report of the Fishery Board for Scotland, we find that, in 1866, Scotland exported to Ireland 27,538½ barrels of herrings, and 38,845 cwt. of cured cod, ling, and hake, the money value of which was about £66,300. Add to this the large importations of stock fish from Norway and Newfoundland, and the value of cured fish imported by Ireland rises above £200,000 for the one twelve months. Here we have a demand on the spot, which I have above referred to, for the products of Irish industry. For many years there have been no curing establishments in Ireland. The fish cured by the coast proprietors is of too uncertain a quality to command the market. There is no brand for cured fish, as there is in Scotland, to guarantee to the merchant the quality of the fish offered for sale; and for these reasons we must import our cured fish.

At Baltimore Fishing School a curing establishment is to be started as soon as possible, the hope of the trustees being that, owing to the labour of the industrial school boys being free, they may be in a position to produce material to meet the market at a low figure. Whether this kind of labour will prove cheap or not remains to be seen.

Quite recently a demand for Irish-cured mackerel has been found in the inland States of America. Owing, I suppose, to the great cheapness of Irish fish and the lowness of freights, a Boston firm, with the aid of Messrs. Philips &

* Great benefit has been conferred on the district under consideration by the Clyde Shipping Company's weekly steamer, which touch at all the important ports between Cork and Dingle.

Co., of Liverpool, sent agents this autumn to the coasts of Cork and Kerry for the purpose of purchasing cured mackerel. In some places the fish had been taken from the pickle and dried, or were otherwise unfitted for the American market. The agents, however, succeeded in purchasing about 200,000 mackerel on the Cork coasts at about 4s. per 128 fish, ready cured and packed in pickle in barrels containing about 280 fish each. Later on, the agents visited the Kerry coast, and purchases were effected at 5s. per 128 cured fish.

The right system of curing being now understood, many hands at Portmagee and other places are hard at work preparing fish for this trans-Atlantic trade. This revival of an industry, on a purely commercial basis, is one of the most hopeful signs in the present outlook.

Bounties.—If bounties ever did good anywhere, they ought to be useful in Ireland now, when signs of reviving trade are visible. It is one thing to plant a tree where it never grew before; it is a more hopeful undertaking to encourage the growth of a seedling which has taken root of itself. Competition with old-established firms is the great danger we must face; and it is always likely to nip a new branch of the fish-curing trade in the very first years of its existence. There are good reasons why the bounties granted to Ireland, and which came to an end in 1830, left no permanent improvement. One is, that they were not continued long enough. In Scotland bounties were given from the year 1810 to 1830; in Ireland for only half that time.* The effect of bounties on the Irish fisheries was to raise the number of fishing vessels from 27 in the first bounty year to 12,611 in the year when bounties ceased. When the bounties ceased, a collapse came in the fishing industry.

The effect of bounties in Scotland can best be seen by the following Table:—

[TABLE.]

* From 1800 to 1811 bounties were actually paid to the amount of £23,028 on cured fish *imported* into Ireland, in order to promote the Newfoundland and other fisheries.

TABLE OF BOUNTIES IN SCOTLAND.

Periods.	Total quantity of Herrings cured in Scotland, England, and Isle of Man.	Total Exported.
Bounty, 2s. per barrel. { 1810, one year.	90,185 $\frac{1}{2}$ barrels.	35,848 barrels.
{ 1812, ,,	111,519 $\frac{1}{2}$,,	62,820 ,,
{ 1815, ,,	160,139 $\frac{1}{4}$,,	141,305 $\frac{1}{4}$,,
Bounty, 4s. per barrel. { 1816, ,,	162,651 $\frac{3}{4}$,,	107,688 ,,
{ 1826, ,,	379,233 $\frac{3}{4}$,,	217,073 $\frac{1}{2}$,,
*1830, ,,	329,557 ,,	181,654 $\frac{1}{2}$,,
1831, ,,	439,370 $\frac{1}{2}$,,	264,903 ,,
	<i>Scotland and Isle of Man.</i>	
1851, ,,	544,009 $\frac{1}{2}$ barrels.	266,908 ,,
	<i>Scotland only.</i>	
1869, ,,	675,143 barrels.	381,333 $\frac{3}{4}$,,
1886, ,,	1,312,223 $\frac{1}{4}$,,	938,369 $\frac{1}{2}$,,

From the above it is evident that from the time bounties were granted the herring-curing industry in Scotland grew rapidly and became firmly established. The curing of cod, ling, and hake, exhibits a similar state of things, except that for the year immediately following the cessation of the bounties there was a smart drop in total amount cured, which, however, was gradually regained: the return for 1852 shows a greater quantity than the best of the bounty years.

I would therefore suggest that an attempt should be made to start curing establishments in suitable places. That for some years assistance should be given, say 3s. per barrel or cwt. at first, and then a lesser sum till a vanishing point were reached, when there seemed a fair chance of the undertaking being permanently established.

I consider that somewhere on Valentia Harbour would be a very suitable place for such an enterprise.

Firstly, because it is central for the fishermen of Ballinskelligs, Port Magee, and Dingle Bay; secondly, because

* All Bounties ceased A.D. 1830.

very rich fishing-grounds are near to hand; and, thirdly, because, owing to the remoteness of the locality, the market for fresh fish is lower than in places nearer to the centres of population. The fishermen would be benefitted by the market thus created for their fresh fish.

Fishery Boards.

The same Act which abolished the bounty system in the United Kingdom abolished also the Irish Fishery Board, with its forty inspectors and commissioners, but it continued the Scotch Fishery Board, which has done much good work.

The present state of affairs will best be illustrated by extracts from the "Estimates for Civil Services for the year ending 31st of March, 1888."

Inspectors of Irish Fisheries, 1887-88.	Fishery Board for Scotland, 1887-88.
Salaries, £2916	Salaries and allowances, . £9045
Travelling, 800	Travelling, 1400
Incidental Expenses, . . 645	Scientific investigation, . 2000
	Cutter and boat service, . 3615
<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> £4361	<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> £16060

In the Scotch estimates occur other items, such as "Grants in aid of Piers or Quays," &c., which may be set against the funds in the hands of the Irish Inspectors for similar purposes. But the advantages on the side of Scotland are beyond all comparison greater.

The fact is, we want those things which have produced such good results in Scotland—bounties, a properly constituted fishery board, scientific investigation, and a brand system—the fees from which bring in a good return to the Scotch Board, and concerning which I have more to say.

The Brand.

The brand system has proved such a great success in Scotland,* that it ought certainly be accorded to Ireland. Up

* The following extract from the Report of the Fishery Board for Scotland will show the estimate in which the herring brand is held:—

"Although the total quantity of herrings cured and exported in 1886 was less than in 1885, the proportion of barrels branded to the number cured greatly

to the year 1859 the Scotch brand was given free. Since that date a charge has been made. The fee at present charged is 4*d.* per barrel, and this brought in, to meet the expenses of the Board, in 1886, no less a sum than £8649 18*s.* 2*d.* The standard for which the brand is given has, at the request of fish curers in Scotland and merchants on the Continent, been slightly raised; and an important fact to remember in considering the brand is, that it is in favour of small or newly-established curers rather than the large firms of well-known reputation.

In extending the brand system to Ireland we should not think, as too often has been thought, that its use in this country must be an exact copy of what is done in Scotland. The conditions in many ways differ. The curing of herrings would succeed very well, no doubt, on our East coast, but on the South and West the herrings caught, as before pointed out, seem too rich and oily for curing purposes. Our specialty in the south and west is MACKEREL, and, as when cured mackerel are so much prized as to pay for their transport across the Atlantic, the sooner a brand is adopted for them the better. A natural growth like this ought to be stimulated and encouraged at once in every way possible; and, as we have seen, nothing is more necessary for the export trade than the Government brand.

An agent for purchasing dried mackerel visited Berehaven this autumn; but I am informed that, owing to the fish being split along the bellies instead of down the backs, he went away without buying any. With a Government brand the expenses to a firm of sending agents to inspect their purchases would be saved, and the trade encouraged.

Cod, ling, and hake, were branded in Scotland up to 1850. The fishery for these fish covers nearly the whole year, so that there ought to be no slack season in our curing houses, and market for these fish would quickly be found, beginning in our own country, if the quality was only guaranteed.

exceeded the average of recent years. . . . As the taking of the brand is entirely optional on the part of curers, the large continued demand for branded herrings is gratifying to the Board, as showing the estimation in which the standard of cure required is held."

Despatch of Fish in a Frozen State.

This, probably, is the best place to consider the questions (A) Whether fish may not profitably be stored and despatched in a frozen state? and (B) Whether any serious deterioration in quality takes place in the act of freezing?

(A.) The frozen meat trade is thoroughly well-established; and as I had the opportunity of observing the process on a voyage to Australia in a steamer fitted with every appliance for this trade, I shall briefly describe it.

The hold of the ship is lined with boarding, leaving a space between floor, ceiling, and sides, of a foot or more, which is filled with sawdust; the entrance doors are cased and packed in a similar manner. Racks are provided for receiving the carcasses of mutton and beef.

The chamber for the meat cargo being thus ready and insulated by the non-conducting layer of sawdust from the temperature of the surrounding atmosphere, a small steam engine is set to work to compress air in a cylinder; the temperature is raised by compression; but when the compressed air has cooled down to the temperature of the atmosphere, it is allowed to expand; in expanding, its temperature necessarily runs down, and it is discharged into the ship's hold so cold that the general temperature quickly falls to 10 or 15 degrees below freezing-point, and everything in the hold turns to solid ice. On shore, stores are fitted with a similar contrivance; so the cargoes are ready to ship already frozen, and all that the engine in the ship has to do is to keep the temperature at freezing-point during the voyage.

Stores already existing in close proximity to quays in our southern and western ports might, at small cost, be lined with sawdust and converted into freezing chambers. In some places water-power might be available to work the freezing engine, but the saving of expense in water power over steam power would not compensate for the expenses of carting, if the store had to be any distance from the place of shipping and landing fish.

Fish could be stored in such a place, and probably an entirely new aspect given to the fish trade; for, nothing has a more depressing influence on the market than the necessity of parting with fish at any price when once caught; at one time there being a perfect glut of fish, while at another a fish famine.

By freezing, fish could be stored like corn or any other commodity and sent to dealers all through the country in quantities sufficient for their daily needs, and the possibility of getting a supply thus regularly would lead dealers to enter into the trade in inland towns, where now fresh fish is rarely or never sold. I see some slight practical difficulties in the way of adopting such a scheme: fish could not be frozen in great heaps; they should be either placed in layers in racks or packed in small boxes, in which also they could be despatched and then frozen. In the case of small fish, such as mackerel, they would require more manipulation than in the case of cod, hake, or other large fish; but these being only technical difficulties, they would, no doubt, easily be overcome in practice.

(B.) It has been urged that fish deteriorate in freezing. This may be true to a very small degree, but that the keeping qualities of the fish on being thawed are lessened is beyond doubt. This latter drawback to the system cannot, however, be of much importance in the British Islands, where the distance to be traversed between the store and the consumer is so small, when we consider that for many years this system has successfully been adopted in North America. In Canada the storing of fish in a frozen condition, and then despatching it over thousands of miles by railways to the great cities of the United States, has been most successful. At the present moment the system of freezing fish for the purposes of exportation to Continental towns is being practised in the western ports of France, a chemical process, and not the one I have described, being that adopted.

On my Australian voyage I partook of turbot, soles, plaice, and salmon, taken from the freezing chamber, and considered that the quality was similar to that usually obtained at a fishmonger's.

Live-fish Trade.

I have already spoken of the great difference between the value of fish taken to market *alive* and dead fish. From such distant fishing-grounds as Rockall and Iceland fish can be brought to market alive by well-boats: why, then, should not some effort be made to develop this means of benefitting the Irish market? A Cornish gentleman, who takes a deep interest in the Irish Fisheries, and whose business engagements

place him in a position to understand the case, expressed to me his opinion that, with a little trouble in organizing the supply and arranging depôts, cod, ling, and haddock, might easily and most profitably be delivered alive in such markets as Liverpool and Plymouth. If any assistance were offered in the way of guaranteeing a new company against the loss usually incurred in a first year's work, well-cutters could easily be induced to visit the Irish coast during the cod and ling fisheries. At present well-boats do come to our shores for lobsters. Depôts for these exist in every creek on the south-west coast, and a cargo is always ready for the Southampton cutter when she arrives. Depôts for live fish would involve a larger expenditure; but if these existed, the well-cutters would soon make their appearance. Some of our fishing-boats should be provided with wells to keep the depôts supplied; but as the fish need never remain more than twenty-four hours on board, these wells need not be so large as to interfere with the boats being also used for drift-net fishing.

Large sums of money entrusted to the Irish Fishery Inspectors are tied up, owing to each sea-board county having a share allotted to itself. In some of these counties no use is made of the fund, while, in other counties, where the fishing industry is developing itself, the amount available for loans is a long way short of the demand. If the fund could be made a general fund for all Ireland, I believe there would be plenty of money available for starting a live-fish trade from the south and south-west of Ireland.

If anything further is necessary to show how our west coast fishermen suffer from the want of means of conveyance, this one fact will be sufficient. At the same time that sole were quoted in Birmingham market at 1s. 4*d.* per lb., sole of fair average size were being sold by beam trawlers on the Kerry coast at 3*d.* each. This low price was exceptional, but was entirely due to want of land conveyance.

Investigations now being carried on on the Scotch coast seem to show that beam trawling in shallow bays does permanent injury to the fishing. If this is proved to be the case, further restrictions may be advisable on the Irish coast. In view of these being made, or even owing to the decrease of fish on certain portions of the coast, it would be most important that the deep-water grounds should be explored and charted out. At Milford, steamers have recently been specially fitted for carrying on trawling in the deepest water

of St. George's Channel. The enterprise seems to be a very paying one, and might, no doubt, be carried on from Waterford with nearly equal profit; but I have every reason to believe, chiefly from our experiences on the Royal Irish Academy expedition, that off the west of Kerry there are fine deep-water trawling grounds. I spoke to the Dingle trawlers on the subject, but they dreaded tearing their nets. The one haul I took in 80 fathoms in a twenty-ton yawl, during the course of last summer, did result in a torn net, but the fish "meshed" in the portion which came up showed plainly that the fish were there. Mere sounding will not do in order to test the safety of a trawling ground. The trawl itself must be used along certain carefully-defined lines. Many nets would, no doubt, be lost; but the cost of mapping out the clear ground would be trifling, compared with the information which would be thus placed at the disposal of local fishermen.

So far I have spoken of the ways in which the fishing industry of the south of Ireland might be benefitted: it remains for us to see whether anything might be done for the men themselves. It is an unfortunate fact—but the trawlers at Killybegs and other places on the Irish coast, and the mackerel and herring fisheries, prove it to be true—that when a fishery seems to offer a fair chance of profit, English, Scotch, or other boats turn up at once, and prosecute it to the best advantage. However, experience shows that, in many localities, Irish fishermen are pulling up lost time, and coming to the front. The Ringsend, Dunmore, and Dingle trawling fleets, the Kinsale and Skibbereen mackerel boats, and the east coast herring fleet, are evidence on this side of the case. In each case they have waited till strangers showed them how the thing might be done—a legitimate conclusion from this is, I think, that probably there are other ways in which development might take place, if the men were only *shown how*. In the Blue Book on "Irish Industries," we find the Rev. T. G. Flannery, P.P., of Connemara, giving evidence as follows:

Question "13193. Are there any of those men who have got boats who distinguish themselves, and who would be fit for employing in larger boats; enterprising men?—Yes, they are very enterprising men. The only thing that would be required is, that they should be taught how to fish as they are fishing in this particular time; that there should be large boats sent down by the Government to instruct them how to fish."

Here is more work for a fishery Board. H. M. Inspectors seem to have been untiring in their efforts to promote advance in all these points, but the field is too vast.

In America, as the Reports of the U. S. Fish Commission show, no pains or cost is spared in helping men thus to help themselves. I recently received from the Secretary of the U. S. Fish Commission a pamphlet published and circulated for the instruction of fishermen. Nothing could be more practical and simple: it is entitled, "Gill Nets in the Cod Fishery, &c." by Captain J. W. Collins, where an improved method of prosecuting the Cod Fishery—one which I have seen myself at work in the Lofoten Islands—is illustrated and explained.*

The effort being made by the trustees of the Baltimore fishing school is to provide such instruction.

The Appendices to the U. States Reports, the Reports of the Fishing Board for Scotland, and various works in our own and foreign languages, contain much valuable information, which might with great benefit be popularized in a reading book for coast National Schools.

There is much ignorant prejudice, all through the country, against the use of fish as a diet with any other kind of food than potatoes. When potatoes are to be had, large quantities of salt fish are sold in Ireland, but when potatoes cannot be had, the labouring population feed almost exclusively on bread and tea. If bread and fish are not thought to go well together, nothing gives a cheaper and more palatable meal of the kind than rice and salt fish, and of course the nutritive qualities are beyond all comparison greater than those of bread and tea; the exclusive living on which fosters laziness in the cooking department. This is easily recognizable when we compare the fishermen who eat fish with the rural labourer.† Instruction in points of this nature, on what is the meaning of properly cooked food, &c., though apparently unconnected with the fisheries, is really of fundamental importance.

* When visiting Ballycotton I was shown by the Rev. J. Hodges a glass ball which had drifted on shore. I recognized it as one of the floats used instead of corks by the Americans and Norwegians for their deep-water nets. It may have been one of the waifs of the Gulf Stream. On chance of any of my readers being able to name its port of departure, I may mention that it bore the mark "BV" stamped in the making.

† See the evil effects of this prejudice enlarged on in "The Sea Fisheries of Ireland," by John A. Blake, M.P.

Coast Fishermen.—On the west coast of Ireland a difficulty arises in the way of the fishermen there taking part in the great deep-sea fisheries. They are fishermen and boatmen, but not sailors. Take a sailor, put him into a mackerel-boat and he picks up the work in a week. Take a coast fisherman, he could, no doubt, dig a potato garden very well, but put him into a mackerel-boat or a big trawler, and he is "quite at sea." The whole business is new to him, he does not like going far from home, and all the ways of a sailor's life have to be learned. If, then, we want to make our west coast fishermen truly fit for our deep-sea fisheries, some provision should be made for binding the boys as apprentices in boats already engaged in the deep-sea work; and the fees for such apprenticeships might be very well given, in certain districts, as prizes in the Coast National Schools.

If they could only be bound to Scotch, Manx, or Cornish boats they would learn far more than seamanship and fishing; they would be in the way of picking up habits of thrift, cleanliness, and other qualities too often conspicuous by their absence on board our Irish boats. I believe prizes given for the best equipped and cleanest mackerel-boats actually at work would be most desirable.

It is a mistake, however, to think that the only way we can benefit the coast fisherman is by turning him into a deep-sea fisherman. Many places on the west coast, quite too dangerous for carrying on *continuously* the deep-sea fishing, are just the places where the coast fisherman, with his couple of acres of garden, boat and trammel-net, or lines, is the very man for reaping the harvest of the sea. When the weather suits he can put off at once. What he wants most of all is to be shown how his fish can become of marketable value. In Ireland I know of no place where the plan of hauling up boats by means of a capstan, so common on the English coast, is practised. Many of our coast fishermen might have larger boats, without the expense of building costly harbours, if they would only learn from English fishermen on this point. The bumping of a big fishing-boat ashore in a surf, and then hauling her up the beach in safety must be witnessed to be appreciated. I have never succeeded in persuading any coast fisherman that such a thing is possible, and commonly done in many places.

The Evil Genius of the Fishery.—The floating grog shops, which for many years were the curse of the North Sea fishing-fleets, are now being successfully combated by the mission

boats. Unfortunately for us, however, whether owing to their trade being thus spoiled, or for some other reasons, they have recently put in an appearance on our coasts. This year, at least, two of these "copers" lay off our south-west coast, selling bad spirits, tobacco, and other contraband goods, to the mackerel fishermen. It behoves everyone interested in the welfare of our countrymen, and in that of the fishermen who visit our shores, to use all the influence they can to prevent the fishermen from having any dealings whatever with these boats. The great saving point of a deep-sea fisherman's life is, that no matter how he may be tempted on shore, he is free from temptation while at sea. If these copers continue to visit our shores this is all at an end.

In a school like that at Baltimore much might be done to give the youths, who it is hoped, will be our future fishermen, some interest in marine natural history. The benefit to the men themselves would be very great. I have often been struck with the intelligence shown by fishermen when discussing natural history subjects. In landmen, of the same class, it is very difficult to promote an interest in anything which cannot be turned into a money value on the spot. With more knowledge to start with, natural history would add a new pleasure to many of their lives; and, no doubt, many a real naturalist has been lost to the world for want of some simple guidance.

In the foregoing pages I have attempted to show—(a) That the supply of fish is unlimited. (b) That the demand is good in certain markets, but that owing to the cost of conveyance there is a difficulty in distributing the fish through the country. (c) That the existing boats and harbours are sufficient for the present demand. (d) That improvement should be sought for by improving the demand—(1) by providing buyers with greater facilities of land carriage; (2) by organizing the despatch of live fish; (3) by encouraging curing establishments, and branding the fish. (e) That the condition and early training of our fishermen might, in many ways, be improved; and, lastly, that a properly constituted Fishery Board* should be appointed to carry out every-

* If, taking pattern from the constitution of the Scotch Fisheries Board, scientific study should ever be encouraged, a marine laboratory should be established, towards which much help would probably be given by scientific societies, and if a vessel was set apart for marine investigation, I think the best class of

thing necessary for the advancement of the fishing industry, to take charge of all grants for the same, and to be solely responsible for such grants being wisely expended.

In concluding the report I must tender my best thanks to the Rev. J. Hodges, Rev. J. L. Darling, Rev. I. Reeves, Dean of Ross ; Rev. C. Davies, P.P. ; Daniel O'Connell, Esq., of Derrynane ; and Rev. A. Delap, and many others for the kind assistance they gave me in collecting the necessary information.

APPENDICES.

APPENDIX A.

FOOD OF MACKEREL.

HAVING questioned some intelligent fishermen, I find that, besides the presence of red copepods,* the sea, when the mackerel are met with, is clouded, or "dirty," with some scum diffused through the water; also that on some nights a vast amount of phosphorescence abounds, the nets looking like a "wall of fire" in the sea. Taking into account the *Challenger* observations of the supposed phosphorescence produced by swarms of pelagic unicellular organisms, and also the recent observations of Dr. Kuckenthal of Jena, in the Arctic Seas on the association of diatomaceæ and red copepods, I am inclined to think that a vast development of unicellular algæ takes place in the early spring off our coasts. The red copepods swarm to feed on these, and the mackerel are attracted by the great supply of food. If this is true, it may turn out that the movements of mackerel depend on the development of an alga. I have not been at sea myself on the south-west coast in the very early season, but I have arranged with a mackerel-boat skipper to send me specimens of the water in the season of 1888.

craft for the work would be a well-vessel, fitted to sail fast, and provided with auxiliary screw and steam capstan. She would be thus fitted for all practical work and likely to maintain herself for a part of the year by carrying cargoes of live fish to the markets.

* See page 1.

APPENDIX B.

MANAGEMENT OF A MACKEREL-BOAT.

The Manx boats, which first visited our shores some twenty-five years ago, were thirty-ton yawl-rigged boats, and gave the model on which most of our boats have been built. Now they have all, or nearly all, become luggers. The Irish boats, however, adhere to the fore-and-aft rig. The Manx men use slightly longer nets than the Irish, 6-score nets in the train for the former, 5-score nets for the latter. Most of the Manx boats, and some of the Irish boats, are provided with steam engines for hauling their nets. Steam is a great advantage, for with it they can often haul their nets in a gale, when otherwise they would be lost; also the nets can be left longer fishing, owing to the time saved in the hauling. A steam-engine costs seventy pounds, and counts for one man, one man's share going to pay for it, while it gives the help of three.

In a boat without an engine the crew consists of a captain and seven men. One half gross receipts goes to the owner of the boat; the other half is divided into nine shares, of which the captain gets two, and the men one each. The advantage of men who are also part owners working the boat is thus obvious. When they are members of one family it is best of all, for then disputes arising out of part-ownership are obviated.

APPENDIX C.

BEAM, OTTER, AND POLE-TRAWLS.

One thing which makes it unadvisable to change the size of mesh found most useful by beam trawlers, is that their trawls are fishing for many hours at a time; in the open sea grounds six hours is the usual time that the trawl is down. If the mesh is too large a great number of marketable fish would be spoiled, particularly the sole, by getting their heads out through the meshes, and so being torn to pieces. The ground-rope of a large beam trawl, to which I have referred, may be described thus:—The lower edge of the net is mounted first to a small rope, alongside which a heavy three- or four-inch rope is bound, the two are parcelled round with old net, and then

served closely with an inch and a half rope, so that the whole has a circumference of 6 to 8 inches or more. This great complication of ropes slides more easily over mud than a thin rope, and when on hard ground it gets so weighted with sand that it takes "a good grip of the bottom," *i. e.* grinds along. I have several times asked beam trawlers why they would not use a small leaded rope on hard sand, and the reply always is, that experience has proved that the heavy sand-laden foot-rope disturbs the ground to a greater depth, and so they catch fish that the other rope would pass over.

The foot-rope of an otter or pole-trawl is simply a leaded rope, and does not disturb the ground to the same depth. It may be asked, if the big foot-rope is the best, why is it not used with the otter and pole-trawls? The answer is simply this, that owing to there being no rigid beam to keep their mouths open these trawls would close up and so not fish if the foot-rope took a grip of the bottom.

These facts will, I hope, explain what I mean, when I say that a large-beam trawl is well calculated to destroy the molluscs, worms, crustacea, &c., on which fish feed.

December, 1887.

Houses of the Oireachtas