PART I.

Chap. I.—The North Sea Fisheries.

In addition to trawling, with which we are here almost exclusively concerned, the North Sea furnishes scope to a number of other branches of the fishing industry. Of these, line-fishing and drift-netting are the most important; oyster-dredging is a considerable deep-sea industry, and whelking may almost be included in the same category. The remaining branches, such as crabbing, lobster-potting, shrimping, and seining, are carried on in the more or less immediate neighbourhood of the coast. We are concerned with none of these except in so far as they may be shown to affect, or be affected by, trawling.

The North Sea fishery, if the apparent paradox may be pardoned, is by no means confined to the North Sea itself, since it is impossible to leave out of consideration the fishing operations of vessels belonging to, and regularly landing their fish at, North Sea ports. Many of these, chiefly liners, derive the bulk of their fish from grounds which lie altogether outside the limits of the North Sea. The Orkney, Shetland, and Faröe Islands, Rockall and Iceland, are all extensively worked by North Sea codmen, and the last-named district to some extent by trawlers also; the fish from these grounds pass through the North Sea markets, and are not discriminated in any Government returns from those caught in the North Sea.

A certain number of boats belonging to North Sea ports are engaged in fishing operations on the west coast of England and elsewhere, but, for the time being, they land their fish on the west coast, and so may be considered to cease to belong to the North Sea fishery. Drift-net boats—at least those which are worked the whole year round—may be said to be nomadic, making their headquarters in whatever district the fish may be at the different times of the year.

Fisheries of various kinds are carried on all along the east coast of Scotland, and these must of course be held to belong to the North Sea group. The bulk of the line-fishing, however, is done close to the ports to which the vessels belong; and even the trawlers,

which are by law excluded not only from the territorial waters, but also from some grounds which can hardly be said to lie within the territorial limit at all, take very little part in fishing the grounds frequented by vessels from the east coast of England. An occasional Scotch steam-trawler may be found fishing the southern part of the North Sea, and landing her fish at an English port, but otherwise the industries of the two nations do not seem to commingle much. Consequently I do not think it would be profitable to enter here into a discussion of the Scotch trawl-fishery, even if I possessed any special qualification for the task.

The trawling industry of the east coast of England centres itself at various points along the coast, which are roughly divisible into a northern and southern group. The northern group comprises Grimsby and Hull, and several ports of minor importance, while Lowestoft and Yarmouth are the chief centres of the southern group. At certain seasons of the year, vessels from all ports may be found on the same grounds; but, speaking generally, those of the northern group are occupied on more northerly grounds than the rest.

The relative importance of the different trawling ports may be judged from the subjoined list of the numbers of boats owned and resorting to each. The figures, however, have at best only an approximate value, since of the total number of boats belonging to, say Grimsby, there is nothing to show how many may have been employed away from the North Sea, and for how long, during any one year. Again, in the number of boats resorting to a port, the statisticians of the Board of Trade (from whose returns this column has been taken), if they possess any information as to how often boats belonging to other places visited the port in question in the course of the year, do not take the public into their confidence. It appears to be the peculiar function of the Fisheries Department of the Board of Trade to formulate statistics which shall be just sufficiently complete to bring into strong relief the importance of what is omitted from them.

The preponderance of Grimsby as a fishing port is entirely independent of the drift-net fishery, since it sends not a single vessel to that industry. It rests almost entirely on the deep-sea trawl and line fisheries, although a certain number of its first-class vessels are engaged in deep-sea oyster dredging and whelking. Hull, though owning a less number of vessels than Yarmouth or Lowestoft, is only second to Grimsby in the trawl and line fisheries, since the whole of its fleet is devoted to these industries, and its large fleet of steam trawlers much more than compensates for its inferiority to southern ports in the number of its sailing trawlers.

The conditions under which the deep-sea trawl-fishery is carried

Table showing the number of first-class Trawling Vessels owned (i) *and engaged* (ii) *at the chief ports on the East Coast of England.*

	i.			ii.		
	Steam.	Sailing.	Total.	Steam.	Sailing.	Total.
NORTHERN GROUP:						
Grimsby	124*	460*	584	184	546	730
Hull	173	250	423	160	280	440
SOUTHERN GROUP:						
Yarmouth	11	456†	467	11	422	433
Lowestoft	0	300‡	300	0	320	320

Table showing the total number of first-class Fishing Vessels of all sorts owned at different ports on the East Coast of England.

	Steam.	Sailing.	Total.
Grimsby§	143	664	807
Hull	160	280	440
Boston	35	12	47
North Shields	88	0	88
Scarborough	16	71	87
Sunderland	10	0	10
Hartlepool	0	39	39
Yarmouth	11	498	509
Lowestoft	0	447	447
Ramsgate	0	159	159

* Of these vessels, 4 steam "fleeters" and 82 smacks may really be eliminated, as belonging to a company which fleets all the year round, and lands its fish at London by steam cutters.

† Of this number 71 sometimes trawling, at other times drift-netting.

‡ Mr. B. M. Bradbeer (in litt., 19/2/95) remarks that there are between 30 and 40 Ramsgate trawlers which work from Lowestoft. Column ii (from Board of Trade Returns for 1893) is therefore too low for the present year.

§ The number of trawling vessels has already been specified; the balance is made up as follows:

(i) Steam codmen 20
(ii) Cod smacks 76
(iii) Oyster smacks 14
(iv) Whelkers 17

The crews carried by these vessels are—for (i) skipper, mate, four deck-men, three or four apprentices, two engineers, two coal-trimmers, and steward; for (ii) skipper, mate, two or three deck-men (three if there are less than four apprentices), and two to four apprentices; for (iii) six men, including skipper; for (iv) four men including skipper.

out at the different ports differ, so far as I can learn, chiefly in regard to the grounds affected, and in regard to certain market customs and requirements with which we are not here much concerned. My own knowledge of the deep-sea work is derived almost entirely from Grimsby, so that any remarks I have to make must be taken as applying to that port, unless special mention is made of another. I do not know of any particulars in which the Hull fishery differs from that of Grimsby; the boats seem to work precisely the same ground, and are of the same build and average tonnage. Much of the Scarborough trawling fleet is more or less constantly employed at Grimsby, and steamers from the more northern ports are at least frequent visitors.

The fine fleet of steamers owned in Boston appears to be engaged in the same operations as those from Grimsby and Hull. I cannot claim much special knowledge of the boats belonging to southern ports, but I believe that the necessarily scanty nature of the account which I give of them is of little importance, owing to the absolute preponderance of Grimsby and Hull in the North Sea trawl-fishery as a whole.

Besides the deep-sea fisheries, in which we may include trawling, lining, and drift-netting, and, at Grimsby, oyster-dredging and whelking, there are a certain number of men at most of the larger ports engaged in longshore work of one sort or another, such as shrimping, prawning, crabbing, seining, whelking, stake-netting, inshore line-fishing and trawling, &c. &c. With some of these we shall have to deal in a later chapter.

The regular prosecution of the deep-sea fisheries may be said to be confined to such large centres as our remarks have hitherto dealt with. Such centres have, no doubt, attained their present importance in virtue of physical conditions which have lent themselves to the development of the fishery on a large scale, but there exist, of course, a great number of smaller communities.

In fact, wherever the nature of the coast permits of the launching of a boat of any sort, there will be found a race of fishermen engaged in such operations as the harbour or beaching accommodation and the resources of the adjacent grounds permit.

But the conditions of these small communities are altogether different from those of the larger centres. Their importance, in fact, may be said to be purely local, and the share which they bear in the production of the general food-supply of the nation is so insignificant that the extinction of any one of them as a fishing community would hardly be felt outside the limits of the parish. It needs, however, no argument to demonstrate that their welfare is none the less important on this account; and I believe that for many years the

recently constituted District Fisheries Committees will find the most profitable outlet for their legislative energy in safeguarding the true interests of these smaller communities, while they are fitting themselves for the much more difficult task of coping with the problems in connection with the greater fisheries.

Apart from the question of its production, a small fishing community differs essentially from the larger ones in what may be termed the social conditions of the industry. In many cases—in fact, in most—the men are fishermen by heredity, and every member of the family assists in the trade to the best of his or her ability. For generations the men have been fishermen, intermarrying almost entirely amongst families engaged in the same occupation, and it seems quite possible that it will be some time before those twin reformers, the board school and the penny novelette, will succeed in seducing any considerable proportion of the race to pursuits which may appear to offer greater profits at less outlay of work and hardihood. In these small communities there is hardly such a thing as specialisation in fishery; every man is acquainted with, and practises in due season, every mode of fishing which is possible to him, and frequently ekes out his subsistence by farming on a very small scale.

There are among them no fishing companies, not even smack-owners on a large scale, but each man either owns his own boat, or at least stands in a much more familiar relationship to the owner than is the case in the larger communities.

My own acquaintance with the small fishing centres is confined to those on the coast of Yorkshire, and among them we find represented almost all stages in the evolution of a modern fishery. Some appear to have retained unchanged the condition which must have been ancestral to that of nearly all the large stations. Others are perhaps in a state of transition. I include Scarborough among the larger centres, in virtue of the number of first-class vessels which are owned at, if not by any means constantly worked from, that port, but it presents certain peculiarities of interest. The development of the fishery, due to the introduction of trawling, has by no means swamped the inshore fisheries; while the limitations of the accommodation for large vessels, and the competition of other centres possessing better harbours and greater railway facilities, appear to have put a term to much further progress in the deep-sea industry. At the same time the protection afforded to the inshore men by the District Committee's regulations appears to be materially improving their welfare, and may tend to bring about something of a reversion to the more primitive condition.

The important part which the introduction of trawling has played

in the modification of the fishing industry of communities which were originally devoted to longshore and drift-net pursuits, cannot be better illustrated than it is in an account which my friend Mr. T. N. T. Potts has given me of the Sunderland fishery during the period covered by his own memory. It is reproduced at length in a succeeding chapter (p. 367).

In the smaller fishing stations, where no sufficient harbour or beaching accommodation exists, it follows that there are no large fishing vessels. Such may be owned and manned by the men of a small station, but of necessity they frequent some port with a suitable harbour. The work is chiefly carried on in small open boats, cobles and whalers, which can be beached without much difficulty. The nature of the fishing varies with the time of year. In the spring and early summer the manipulation of crab-pots will occupy the bulk of the community; later in the year the herring make their appearance, and promptly receive due attention. For their capture either the small open boats are used, or larger decked boats which spend the rest of the year high and dry on the beach, or, at Whitby, far up the river.

The herring season (or in the south the crabbing season) over, recourse is had to line-fishing, chiefly for cod and haddock, and the question of bait at once becomes of importance. If a productive mussel-bed exists within a reasonable distance, cargoes are brought and re-sown by the larger vessels before the latter are laid up, and from time to time the supply is renewed,—by the cobles, if weather permits; if not, by rail. Where the coast is rocky, "flithers" (limpets) are collected, as required or available. Lugworms are highly prized, but are comparatively little used, as few are obtainable at any place where an inshore line-fishery is carried on, and their perishable nature has so far militated against their dispatch from the Humber estuary, where they swarm unmolested in countless thousands. On the sandy part of the Yorkshire coast south of Flamborough the chief bait supply appears to be whelks, obtained by "potting;" but other bait, such as squid, herring, and mussels, is imported.

It need hardly be remarked that the conditions, social and otherwise, under which the deep-sea fisheries are carried on from large ports, such as Grimsby and Hull, are altogether different from those which obtain among the small inshore communities with which we have just been dealing. Deep-sea fishing, involving prolonged absence from port in every possible kind of weather, can only be carried on in decked vessels of considerable size, and manned by a number of skilled hands; and we find the fisherman, instead of being owner or part owner of the boat in which he fishes, is usually

a hired servant, receiving a regular wage, and interested to no considerable extent in the pecuniary success of his fishing operations. In some cases, which are becoming, I am told, fewer in number every year, the skipper is also the owner of his vessel,—either actually so, or, much more frequently, owner only in name and on sufferance of the mortgagees. By far the greater number of vessels, however, are in the hands of companies or large private owners, and the hands engaged in working them are simply the servants of the owner. The method or rate of payment differs according to the rank of the hand. Thus the master or skipper, and the mate or "second hand," are paid in shares of "clear money" or the profits, and are held responsible in corresponding shares of the expense if the vessel is worked at a loss. In the case of a steam-trawler the expenses reckoned in estimating the clear money are coal, engine-room expenses, ice, and men's food, and 5 per cent. on the price obtained for the catch. After these items have been deducted from the gross receipts of the voyage the skipper gets "one share, and one quarter and one half-quarter" of the balance, which is divided into fourteen shares. The mate, or second hand, takes one share and one eighth. Both skipper and mate pay for their food, provided at retail prices from the company's stores by the steward. The "third hand" and the "deck hands" are paid a fixed salary, are provided with food by the owners, and are also, in common with the apprentices, allowed to make what money they can by the sale of "stocker bait," a term which formerly included a number of the less valuable kinds of fish. Some years since the owners, finding a decrease in their profits, and noting, no doubt, a rise in the price of fish which had previously been hardly saleable, came to an arrangement with the men by which the latter surrendered their rights to the "stocker" and received an increase of pay, which was supposed to compensate them for the loss. They have, however, retained the right of selling fish-livers for their own profit. The livers are stored in ordinary petroleum casks, and sold to oil refiners at ten shillings per cask. As may be imagined, it takes the livers of a considerable number of fish to fill a cask, even when liberally adulterated with sea-anemones (*Actinoloba dianthus*), so that the profits accruing are not excessive. I have known instances in which the men have been allowed to sell such fish as gurnards and rays for their own profit, but I believe that the owner is strictly within his rights in laying claim to everything that comes on deck. It will hardly be credited, perhaps, that within the memory of living fishermen, haddocks were a perquisite of the apprentices!

In a steam-vessel the engineers receive a fixed wage, and have no interest whatever in the catch. The coal-trimmer is usually an

apprentice; his duties are by no means confined to trimming coal, and he receives his share of the "stocker," besides many attentions from the superior members of the crew, with which he would probably be glad to dispense. Line-fishermen, besides their regular pay, receive a certain sum per head of fish, but this is not the case with trawlers. In all cases the owner finds everything in connection with the equipment of the vessel, and provides a steward or cook, who is paid a fixed wage. The remainder of the crew are paid weekly wages, and are supplied with food by the owners.

The skipper of a steam codman receives 9 per cent. of the "clear money." The mate gets £1 per week, and 3*d*. in the pound on the clear money; deck men £1 per week and 2*d*. in the pound on the clear money. The engineers get respectively £2 5*s*. and £1 15*s*. and their food while at sea, but take no share of the catch.

Now the conditions of service, which I have endeavoured to sketch, obviously involve a social atmosphere very different from that which one encounters in the small communities of inshore fishermen.

The duties of the deep-sea man commence when he goes on board his ship; and when he has landed the fish and cleaned the vessel his interest in her ceases until she starts on her next trip. In consequence his family, if he possess one, takes no sort of share in the fishery. Again, the large size of the vessels and gear employed in the deep-sea fisheries involves a considerable intricacy in the technique of fishing operations, and thus to a great extent the men become specialists either in trawling or lining: some adaptive geniuses of course there are, but as a rule a man is either a trawler or a liner, and not both, and the members of these two branches of the profession appear to have surprisingly little intercourse with each other. But if there is not much intercourse, neither is there much friction, and you shall hear from ten inshore line-fishermen more abuse of trawlers in ten minutes than you shall hear from a hundred deep-sea liners in a year. The fact appears to be that the social conditions of the larger communities, if not very obviously conducive to the higher graces of manners and speech, at any rate tend to evolve an independence and self-reliance which are not always as evident among the inshore men as they might be.

It has often been suggested to me by persons well acquainted with the district that the conversion, for part of the year, of some of the smaller fishing centres into watering-places has had rather a demoralising effect on the fishermen. The prospect of being able to make a good deal of money by pleasure-boating in the season is said to make the men rather careless of the fishing, and it can be well understood that a fisher-lad is not likely to attain to great skill in his profession if he employs a large part of his time in other pursuits. Indiscriminate

charity is also said to have had a bad effect; and, indeed, it can hardly conduce to a man's independence to have benevolent old women advertising for his relief!

The deep-sea fishing is not entirely confined to trawling and lining, though these pursuits occupy by far the largest proportion of the Grimsby fishermen. In addition, a certain number of smacks are engaged in deep-sea oyster dredging, and there is a considerable fleet of "whelkers." Judged by Hull and Grimsby standards, the boats engaged in whelking are comparatively small, but since they remain at sea for prolonged periods they may conveniently be classed among the deep-sea craft; they are all sailing-vessels, as are also the larger boats engaged in oyster-dredging. Lining and trawling are carried on both by smacks and steam-vessels. The former are nearly all first-class vessels, varying from 95 to about 60 tons (displacement measurement), though there are a few liners of small size. The steam-vessels do not differ from each other greatly in dimensions, but they are still undergoing a process of evolution. The present fleet includes a few which are simply smacks into which engines have been put, while the rest have been laid down as steam-vessels, and exhibit various stages of improvement according to their age. The very newest departure is the adaptation of the petroleum engine to fishing purposes, an enterprise which has yet to stand the test of experience, but which seems to have all the elements which should conduce to a successful issue. Steam is not utilised in fishing purposes for motive power alone, since even the sailing trawlers are fitted with a small engine for heaving up the trawl and hoisting the sails. The lining vessels have no use for steam except as motive power, since, as the long-lines are hauled by the ship's boat, no adaptation of steam-power to an "iron man" is practicable. These vessels are of course fitted with a well, while trawlers have an ice-room and fish-hold. At least one steam-vessel, the S.S. 'Aquarius' of Grimsby, has a compartment which can be filled with water as a well for lining purposes, or pumped dry to serve as a fish-hold, and can therefore be utilised for either branch of the industry. In the majority of lining vessels there is no means of closing the apertures by which the water is admitted to the well, an obvious disadvantage when it is necessary to bring the vessel a considerable distance up an estuary or into a harbour, where the low specific gravity and general impurity of the water are prejudicial to the living freight. If the well is fitted with valves, good water can be brought in from the open sea, but there is a disadvantage on this side also, since, if the ship has to lie in dock some hours before unloading, the water stagnates and the fish are asphyxiated. The leading spirits of the fishing community have, however, proved

equal to the emergency by devising an air-circulation. The device has been arrived at, I believe, quite independently, although the principle of an air-circulation has long been familiar to those interested in aquaria, and we have here an instance of a case in which the "practical" man might have saved himself much expenditure of ingenuity by a little attention to what is being done by his scientific brethren. It may be urged, perhaps, with equal truth that the biologist should have perceived the opportunity of an economic improvement, and I have to confess that the idea of adapting an air-circulation to a ship's well did not occur to me until last spring, when I had occasion to fit such a circulation to the Cleethorpes tanks. On communicating my ideas to a smack-owner I found that he was at that time actually engaged in patenting an apparatus essentially similar, but devised entirely by himself and friends.

The preceding remarks will perhaps suffice for our purpose, without entering into a long technical description of the various classes of fishing vessel. Indeed, such is hardly necessary, as Professor M'Intosh has recently published in the Association's Journal a detailed account of Scotch steam-trawling vessels, and the later types of these agree with the Grimsby boats in all essential details. It may be remarked, however, that a deck-house is confined to Aberdeen boats, and no English trawlers that I know of carry an otter-trawl.

Grimsby steam-trawlers are divided into two classes. Those ranging from 35 to 40 tons nett register are spoken of as "inshore" boats, though it must not be supposed they work what are, strictly speaking, inshore grounds. These boats carry a 50-foot beam-trawl and 200 fathoms of warp. The larger steam-trawlers range from 50 to 70 tons, and carry a 56-foot beam and 250 fathoms of warp. The bridles in both cases are 26 feet long.

The smaller trawl-smacks carry a beam of 44 feet, and 140 fathoms of warp. The larger ones have the beam 50 feet long, and 180 fathoms of warp. The warp of a steam-trawler is of wire, smacks using warps of manilla rope.

The sailing trawlers at Grimsby and Hull are fast being superseded by the steamers. The latter increase every year, while the former are gradually disappearing, those which succumb to wreck or old age being seldom replaced by new ones. At Boston the deep-sea trawling industry was started by steamers, and has never been carried on by smacks at all.

At Lowestoft it appears that steam-trawling has been considered unsuitable, and that the smacks are increasing. Moreover, at this port a class of vessel smaller than that generally in use at the Northern ports finds most favour, and the modern type of smack

is only from about 45 to 50 tons. Yarmouth and Ramsgate smacks are, I believe, essentially similar to those of Lowestoft.

It is hard to see why Grimsby men should consider that the large smacks are the best, while Lowestoft men prefer the small ones, since I know of no difference in the conditions under which the fishing operations are carried on from the two ports to account for this. The Grimsby smack has been evolved, chiefly by gradual increase of size, from the much smaller South coast boats, which first opened up the North Sea trawling; and every step in their enlargement seems to have been viewed with apprehensions, which were never justified by the results. The largest I know of exceed 90 tons register, and it is impossible to say that the size would not have been further increased had not the immensely superior catching powers of the steamers practically diverted all piscatorial ingenuity into a new channel.

One branch of trawling remained exclusively in the possession of smacks until quite recently. This was fleeting,* the function of steam being confined to the carriage of fish, caught by fleeting smacks, to market; but within the last two years there have been launched several steamers designed especially for fleeting purposes, and no doubt, if there remain anything to trawl for, the sailing smack will be gradually driven from this, her last vantage-ground.

Chap. II.—A "Voyage" on a Steam-Trawler.

It may be of interest to give a brief account of a trip on board a trawling vessel, as giving some little insight into the life led by our deep-sea fishermen when engaged in their calling.† For this purpose a voyage in July, 1893, as having covered more grounds in one trip than is usually the case, will best serve. The ship, a steam-trawler, was due to sail with the morning tide, and I found my way on board, at the hospital dock, in good time. The engineers were already on board, and one by one the rest of the crew dropped in, the skipper arriving just as it was time to make for the dock gates. Subject to occasional exceptions, the skipper has absolute discretion

* In "fleeting" the trawlers remain on the ground, and transfer their catches to carriers instead of returning to port themselves with the catch.

† I gladly take this opportunity of saying that I have always found both owners and skippers most willing to give me a berth on board their boats, and have received the greatest possible kindness and assistance at sea.

as to what grounds he will fish, and in this instance, as far as I could gather, our skipper had decided to try for a catch of small plaice, and anything else he could come by, south of the Horn Reef, on the Danish coast. However, the plans of skippers are notoriously changeable, and that they should be so is perhaps as good a proof as any of the uncertainty which attends the North Sea trawl-fishery in its present condition. We were hardly clear of the dock gates before we met another trawler of the same firm coming up the river. Professional etiquette, not to speak of other considerations, demanded that both skippers should slow down and have a parley, and the usual query "How's trade?" was, for a wonder, answered with "A good living." Inquiries as to where this "good living" was to be found elicited the information that plaice were plentiful "below" (north of) the Reef, so our skipper determined to give the ground a trial, and laid his course accordingly on clearing the Spurn Lightship. I may here remark that fishermen at sea always appear most willing to give each other information as to the fish to be found on grounds which they have been working. Whether it is correct information or not is another matter.

Having left the river and got a clear course for the Horn Reef Lightship, we have now leisure to have a look at the principal members of the crew. Pretty nearly all the nations of the earth are represented in the North Sea trawling community, from Kroomen to Faröe Islanders, and on this occasion our skipper was a Prussian, and his mate a Dane. The former has the reputation of having landed more undersized plaice than any other man in the world, and it was chiefly this consideration that induced me to seek a berth on his boat. He was fully acquainted with the object of my inquiries, and was, and I believe is still, as anxious as any man that the destruction of small fry should be stopped, but made the perfectly candid reservation that, as long as there was a market for such stuff, he did not see why he should not make use of his experience of the coast, and knowledge of the habits of the fish, to catch more of them than anyone else could. It would be libellous to suggest that a wholesome contempt for the three-mile limit may not have been an unimportant factor in his previous successes. He was excellent company, and certainly did not betray his foreign origin by any ignorance of the intricacies of the English language, as commonly spoken at Grimsby. To his other accomplishments he added that of the violinist, and usually beguiled the tedium of the evening with frequent renderings of the one tune with which he appeared to be acquainted.

The mate, a huge Dane, was known as "Tom," because, I suppose, that was not his name. He was a good-natured soul, and

submitted to any amount of chaff from pretty nearly every member of the crew, but knew perfectly well, nevertheless, how to get the required amount of work out of them. The captain and he were very fond of indulging in elephantine gambols, and gave and received, with perfect unconcern, blows which seemed calculated to stave in the side of a hogshead. The chief engineer, of course, had been brought up in that calling, but his subordinate was an ex-dragoon, whose capabilities did not extend much beyond stoking. The steward had served twenty-one years in the Black Watch, and had lost a thumb, not in the service of his country, but from the sting of a weever (*Trachinus draco*), which he had incautiously handled on one of his earliest voyages. The symptoms, as described by him, appeared to be precisely similar to those which one reads of as resulting from the bite of an adder. The rest of the crew do not call for special remark, but, taking them all round, they were as pleasant and good-natured a set of fellows as one need wish to meet with in any rank of society. They all arrived on board in shore-going costume, looking very unlike the fisherman of romance, and it was not until the evening that they got into their jerseys, oilskins, and sea-boots. The skipper despised the latter altogether, and affected a very ancient pair of "clumpers" (shoes with a thick wooden sole), when the deck was too wet for even him to be comfortable in stockings only. Once the sea-going kit is donned, I have never observed that any change is made until the boat reaches the river on its homeward voyage; and ablutions, if carried on at all, are certainly infrequent. However, any part of the person not covered by oilskins is sure to encounter plenty of water, if no soap.

To resume our narrative, the south-westerly wind had freshened very considerably before we made our land-fall, and the skipper remarked that such weather would have been certain to have spoiled his chances of a catch south of the Reef, since fish will not stay there with heavy weather from that direction, especially so late in the season. The weather had its usual effect on myself, since, though my business takes me a good deal to sea, I am an incurable victim to *mal de mer*, and on this occasion I spent the usual day or so of misery before I was thoroughly right. It did not prevent my noting the duration and locality of hauls with the net, or the fish caught, but tow-netting and microscope work were out of the question. The skipper was exceedingly sympathetic, and prescribed remedies, but to my exceeding good fortune had mislaid the key of his medicine chest, so I escaped with nothing worse than the sea-sickness itself. I should say that the decoction known on North Sea smacks as "tea" had made its appearance not long after we left the Humber.

It consists of a quantity of tea, a tin of condensed milk, and about two pounds of sugar, boiled together for some hours in a huge kettle. Day and night this remarkable beverage is on tap as long as the vessel is at sea, and every man has a mug of it within reach, whatever he may be doing. I can confidently recommend it to anyone who wishes to experience most of the sensations of sea-sickness without the trouble of going to sea. For any other purpose I have nothing to say in its favour, nor, I believe, have those who have medical cognisance of the piscatorial constitution.

Our first haul was made late at night on the Danish coast to the north of the Reef, and for a day and a half we worked along northwards, fairly close inshore, without any luck at all. A heavy sea was running, and we did little but tear our nets, so that all hands were busy mending one net while the other was fishing. The skipper of a steam-trawler appears to have no actual duties beyond that of command, except when the net is being shot or hauled. In the first case he takes the helm, and in the last he has charge of the steam-winch. He takes no share of the watches, nor does he assist in the cleaning and stowing of the fish, but in mending the gear he generally lends a hand. The skipper should be, and generally is, the best hand on the vessel, and with the netting needle certainly no one could come near our particular skipper. All hands, except the engineers, have to turn out when the trawl is shot or hauled, but are otherwise divided into watches. The usual practice on steamers is to make two hauls of six hours at night; and the same, or one of twelve hours, by day. On bad ground, or when fish is very plentiful, shorter hauls are made. Sailing vessels, when "fleeting," usually shoot towards nightfall and haul by daybreak, the daytime being occupied in getting their fish on board the cutter and beating up to windward towards the place where they shot on the previous evening. "Single boating" smacks either follow the same practice or take whatever chance of fishing may be offered by the wind, and of course all sailing vessels are dependent on the vagaries of the weather to an extent from which the "wind-jammers" * are exempt.

The technique of hauling is as follows.† The ship is brought round broadside to the wind, and the main engine stopped. The skipper takes charge of the steam-winch, and the warp is got in until the shackle appears. Then the after-bridle is unshackled and passed to the stem, where the mate makes it fast to a hawser borne

* Steam vessels.

† The mouth of the trawl is formed above by the "beam" terminating in the "heads" or "irons," and below by the heavily weighted "ground-rope." From each "head" runs a "bridle;" the two "bridles" meet at the "shackle," which is connected with the winch of the trawler by the "warp."

on a separate drum of the winch; the after-head is made fast to the ship's side as soon as it arrives in place, while the fore-head is put on to the tackle and hoisted on board. All hands lay over the beam, which is now along the gunwale, and get in the net by hand, getting the ground-rope on board as soon as possible to prevent any fish escaping. As soon as may be a rope is got round the neck of the cod-end, and the bag of fish is hoisted on the tackle and swung inboard, forward of the steam-winch. If the other net is to be shot at once, the bag is usually left swinging until that operation has been accomplished. Then the cod-end is untied, and the contents come down on deck with a rush. The crew at once set to work to clean the fish, pitching them as they are cleaned into the different pounds, which have been formed on deck by letting boards into slots provided for the purpose. Turbot are most carefully bled, and care is taken that they only lie on the coloured side, as the natural position spoils their appearance for market. In winter, plaice are often brought in "alive," *i. e.* with the viscera intact. After being cleaned, the fish are thoroughly washed, with the aid of the hose, in large tubs, and then stowed away in separate compartments in ice in the fish-hold. The rubbish and viscera are shovelled overboard and the decks washed.

The regular round of duty is broken only by meals, and it may be said that the steamboat men live well, though I believe the same is not always the case on smacks. All meals take place in the saloon, but as it will not comfortably hold all the crew at once, the officers—skipper, second hand, and third hand—and the engineer off duty are first served, and then give place to the rest. Breakfast appears at about 7 a.m.; it consists of tea, bread and margarine, and fried fish, generally dabs. Dinner arrives at twelve noon, including hot meat, generally two vegetables, and a pudding of some description. Tea is at six, and consists of cold meat, if there is any, bread and margarine, biscuits and cheese, or jam. Excellent bread is baked by the steward several times a week. The only beverage is tea, except that cocoa or chocolate is sometimes served out after the midnight haul, and anyone who wants it gets a biscuit at the same time. I have not seen beer or spirits on any fishing vessel, and I believe teetotalism is the general rule with Grimsby fishermen when at sea, whatever may be their custom when ashore. Personally I have seen nothing of "coopers," but these work chiefly among the sailing fleets, with which I have had little to do. I remember, during the trip of which I am writing, that we were hailed by a Dutch salt-herring boat who offered us a bottle of Schnapps for a dish of fish, an offer which our skipper declined in language which, if not concise, was certainly lucid.

To resume our narrative. The coarse weather continued for

several days, but after passing to the northward of the "Holman" (Hantsholm) our skipper tired of tearing his net in the heavy swell so close inshore, and steamed outwards to shoot inside the "rough" which runs north and south about fifteen miles from the Danish coast. It is, I believe, what is known to geologists as a "moraine," and consists apparently of detached boulders of various sizes. We got very little fish, but venturing too far out we managed to capture a lump of granite (resembling that from Shapfell) about three feet long by two in breadth. It is the custom when a big stone or other impediment to trawling is brought up in the net, to keep it on deck until the Humber is reached. It is then pitched overboard off the New Sand Buoy, where it will be in nobody's way. Tom, however, would not be bothered with this particular geological specimen, and had it lowered overboard as soon as the net was cleared. The skipper remonstrated, remarking that some one else might "get" it. "Let 'em get it," responded the mate, "they'll get nowt else here," —which seemed likely enough, to judge from our own success.

By this time I had got to work with tow-nets and microscope, and the antics of Copepods and "such small deer" were a source of constant delight to the crew. More astonishing still were the minute pelagic stages of the turbot, which I believe came then for the first time under human ken, though my colleague Mr. Cunningham had already discovered the older pelagic forms at Plymouth. I was able also to introduce my friends to the mystery of artificially fertilising fish eggs, and had hatched out a small family of turbot in a pickle-bottle before we got back to port. Developing eggs of different sorts were of course constantly captured in the tow-nets, and every night the microscope would be requisitioned for the use of the crew, to see how the youngsters were getting on, and to find out how it was possible to tell one from another.

I never lacked assistance in hauling my "trawls," as the skipper elected to call them, and by the end of the voyage that worthy had become comparatively expert in sorting out and pickling the young fish. To subsequent tow-netting operations, carried out by him independently, the world of science is indebted for the completion of the series of the pelagic forms of the turbot and for the discovery of several stages of the mackerel which were previously unknown.

To return to the business of the ship, we moved along inside the "moraine" to a point about thirty-five miles north-north-west of the Reef, and got a few haddock and plaice, with occasional turbot, brill, and hake, but hardly enough to pay expenses. We fell in with a couple of foreign steam-trawlers, but they had had no luck either, so our skipper determined to strike out for fresh ground

altogether. He had rather a hankering after the grounds south of the Reef, as the weather was moderating, but finally determined to try the Great Fisher Bank, so we shaped our course northerly, taking a night-haul by the way on the oozy ground to the east of the Dogger. Going on deck as the trawl came aboard, I was greeted with a sickening odour, apparently of rotten onions, but proceeding in reality from a vast mass of sponge and mud with which the net was choked. There were hardly any fish worth keeping, so we steamed straight on until the leadsman felt the Bank, and then proceeded to hunt about for what the skipper considered the most likely part at that season of the year. The Bank is of great extent, and navigation is not, perhaps, conducted by fishermen in the most exact manner, but in course of time we hit on the "Inner Shoal-water," and got decent, if not large, catches of haddock for some days. The Bank has only been regularly worked by trawlers during the last ten years or thereabouts, and its intricacies are known to comparatively few, of whom our skipper claimed, with apparent reason, to be one. He told me of several parts where the soundings are such as the Admiralty charts (accurate as far as they go) give no hint of, and of one spot in particular, known only to himself and a friend, where splendid bags of fish are always procurable, if you can only find it. On this occasion both coal-bunkers and fish-hold were too empty to allow of any time being spent in what might be a fruitless quest after all, so we remained on much the same ground as long as we could get our fish, chiefly haddocks. Occasionally we got among the dense masses of lemon or scented weed (*Flustra foliacea*), which covers a great part of the Bank, and, especially when using the heavy ground-rope,* we brought cartloads of it aboard. Entangled among it were quantities of tiny cod; and here too we got a few haddock, with the adult conformation, but smaller than any which had previously been immortalised in alcohol. I was surprised to find the anemone *Chondractinia digitata* extremely plentiful; it was almost invariably attached to the shell of a living almond or smooth whelk (*F. antiquus*). The habits of naturalists have hitherto induced them to consider this a rather rare species. I brought many alive to the Cleethorpes aquarium, and was able to verify the correctness, as to colouration and certain other points, of the drawings and description given by Gosse, on the authority of J. Alder, the only actinologist who appears to have been acquainted with living examples. Other equally interesting actinians were met with, and I believe that the obscurity in which several genera are now involved might be

* Some boats have the two trawls fitted with different ground-ropes—one rather light, designed for the capture of haddock; the other weighted, for flat-fish.

cleared up by material collected from the Fisher Bank and adjacent grounds.

After several days on the Bank our skipper began to think of getting nearer home, so a course was steered for the west end of the Dogger, where we had pretty fair catches, and finally we ran home after an absence of twelve days. It was not possible to say anything really complimentary about the weather the whole time, and luck was completely against us at the start, but by sheer perseverance the skipper had managed to get together a very fair "voyage" of fish. Indeed, I am of opinion that what is called "luck" has a less share in determining the fortunes of a fisherman than is generally attributed to it. A man who will have fish, gets them somehow or other. Many men, no doubt, on finding a poor supply after running over to the coast of Denmark, would have simply lamented their ill-fate and fished about on the same ground until the coal ran out, and then come into port without enough to pay wages. Not so our friend, who got his fish, though he had to steam pretty well all round the North Sea to get them, covering about 700 miles, without counting actual fishing operations.

Fishing can hardly be called a lucrative business at the best of times, and the discomforts are greater than can readily be imagined by anyone who has not witnessed, and to some extent taken a share in them. It is astonishing how extremely cold it can be even in the height of summer, with a keen wind blowing and the water splashing all over you as you sit cleaning the fish on deck at one o'clock in the morning. In winter of course the discomforts are intensified. It happened that when I was at sea in March, 1892, we encountered a snowstorm which lasted two or three days. The cold on deck was intense, but of course the work had to be done. When the trawl-beam comes aboard, all hands have to get in the net. The boat is broadside on to the sea, rolling her utmost, as the sails are nearly always left standing to intensify the roll, so as to make it easier to get in the slack of the net as she dips; and laying over the beam under such circumstances of weather, with the sea breaking all over you, is about as unpleasant a job as a man need wish to avoid.

Chap. III.—An Outline of the Rise of Trawling in the North Sea.

Although the North Sea trawling industry has long exceeded in importance that which is carried on along the rest of the sea-board of the United Kingdom, it is probably well known to most people that this method of fishing is not, so to speak, indigenous to the district, but of comparatively late introduction.

No serious attempt at a history of the origin and progress of trawling has yet been made, and it may be feared that by the time it is attempted some attention will also have to be given to its decline. The few remarks which I have to make on the subject here are put forward in all diffidence. They contain only the barest outline of the history, and rest entirely upon information which I have collected from old fishermen, and others who have taken an interest in the trade. I know of no documentary evidence to which reference can be made, but from the general harmony of oral accounts derived from different sources I believe the facts, as far as they go, are approximately correct.

The date of the discovery of the trawl, or of any fishing instrument at all resembling it, is altogether uncertain. On our own coasts the doubtful honour of its introduction seems to have been disputed by the fishermen of Brixham and Barking, but without claim on either side to any very remote antiquity of practice. It seems possible, however, that a fearful engine described as a "Wondyrchoum," against the use of which petitions were presented in the Parliamentary Session of 1376–7, may have more or less resembled a trawl.

Be this as it may, it seems at any rate certain that beam-trawling had been established as a regular industry at Brixham at a period considerably antecedent to the outbreak of the French wars. The boats in use then were quite small, and the trawl-gear could be carried with ease on a man's shoulder. The war naturally interfered greatly with the prosecution of a fishery on the south coast, although in some ways, less reputable than the practice of their legitimate industry, some of our south-coast fishermen seem to have found it not altogether a source of loss.

At the close of the war in 1815 there was a revival of the trawl-fishery, and enterprise began to manifest itself in the search for new grounds. I believe that about this time an attempt was made by the Brixham men to establish themselves at Dublin; but the honour does not seem to have been appreciated by the native fishermen, and the adventure was abandoned. About 1818 we hear that a certain

number of Brixham trawlers migrated eastwards, and established their headquarters at Dover, trawling in Rye Bay and the neighbouring grounds. In or about 1821 the North Sea may said to have been first reached, since at that time the Brixham men began fishing off Ramsgate. The chief ground seems to have been the New or Sandettie Bank, where fine takes of turbot were made for some time, and a more or less regular system of transporting fish to London was now organised.

The tide of migration crept slowly northwards, as new grounds were discovered and in turn exhausted, and about 1828 the system of "fleeting" seems to have been first adopted. Certain boats, instead of returning to port as soon as the catch had been made, banded themselves into fleets, and the catch of the whole fleet would be collected every day by a fast "cutter," and conveyed to market. The system appears to have been organised by fish merchants, who found the cutters and paid contract prices for the fish delivered. It prevailed only during the summer months. Harwich was the port chiefly engaged in these operations, but Barking seems to have had considerable importance as a trawling port either at this time or a little later. The Brixham men, I believe, were in the habit of returning home for the most part in the winter, and, throughout the migration, the most northerly ports reached were always used at first as summer stations only.

About 1830 the discovery of the productive grounds along the Dutch coast gave a great impetus to the trade, and smacks increased both in number and average tonnage. Brixham and Ramsgate seem to have had an aggregate of about fifty-five sail engaged in trawling operations. Local enterprise opened out certain fishing grounds off Yarmouth and Lowestoft; trawlers were hired for this purpose from Ramsgate and Barking, and the fish, chiefly soles, were despatched to London in light waggons, with relays of horses at various posts.

The Dogger was certainly worked by trawlers some time between 1830 and 1840, but it does not appear that it was at first a very remunerative ground. Haddock were of little or no value, and the Dogger plaice are said at first to have been large coarse fish. Boats continued to push northwards, and before 1840 Hull and Scarborough were summer trawling stations, but very little frequented in the winter. The average tonnage was about twenty-five to thirty-five.

One of the most important events in the history of the industry was the discovery, in the winter of 1837, of the now famous sole-ground known as the Great Silver Pit. The master of a Hull trawler, William Sudds by name, being blown out of his reckoning by heavy weather, had the curiosity to shoot his gear in the unusual depth of water which his soundings revealed. The result was

an enormous draught of soles, and the circumstance gave rise to the institution of a regular winter fishery. Boats and capital were attracted from all parts, and Hull became the principal centre of the North Sea trawling industry. The tonnage of smacks also underwent a rapid increase, culminating in that which is now in general use.

What has probably been of more lasting importance to the trade than the transitory productiveness of the Pits, was the introduction of haddock-curing at Hull, which took place about 1840. The haddock is after all the trawlers' best friend, as alone of all the trawl fish it seems able to make headway against the devices of man. Before curing was introduced, there was practically no market for these fish. I am told that only the largest were ever thought worth bringing ashore, and sometimes not even these. Statements have been made that there were no haddock on the Dogger when that ground was first worked, but the balance of the evidence obtainable shows that the fish were exceedingly plentiful there, though of no account, for the reason I have mentioned.

The introduction of ice and the adaptation of steam to fishing purposes occurred, almost simultaneously, about 1850. Steam power, I believe, was first used in the North Sea by Mr. Rushworth, and in connection with line-fishing. The advantages of ice are obvious, since its use permitted the boats to make much longer voyages than had previously been possible. Steam does not appear to have been very extensively used until about 1860.

It will have been noticed from the foregoing remarks that the development of the North Sea trawling has been effected entirely by fishermen from the south coast, and to the present day we find that the bulk of the trawling fraternity are the descendants of south-coast men. Of the rise of the deep-sea line fishing I have little knowledge, but I believe it is also owing, at least in great part, to exotic enterprise. In most of what are now large fishing centres there have existed, in all probability, minor fisheries from a very early period, which have been to some extent masked by the more important modern methods. I do not know that this was the case at Hull; while at Grimsby, which has not yet been mentioned, there was certainly no indigenous fishery of any importance.

Grimsby, in fact, is an altogether modern fishing station. Early references to the port make no mention whatever of any existing fishery, though the adjacent hamlet of Cleethorpes seems to have been always occupied in longshore fishing, whenever its inhabitants had leisure from less reputable pursuits. At Grimsby the existence of a very indifferent natural harbour permitted a certain amount of shipping trade to be carried on from the earliest period of English history, and in 1801 this natural harbour was considerably improved.

The real importance of the port, however, dates from the time at which it began to attract the attention of the Manchester, Sheffield, and Lincolnshire Railway Company. The Company acquired possession of the existing dock, now known as the Old Dock, and proceeded to construct new ones, the first of which was opened in 1852. Additions have subsequently been made, and the dock accommodation at the present day exceeds 100 acres; the population, 3688 in 1841, is now something over 60,000.

The bulk of the dock accommodation is, and has been, devoted to ordinary trading vessels, but the Company seem early to have cast covetous eyes upon the fish trade at Hull, and to have offered every inducement in their power to obtain a share of it for Grimsby. The latter port possesses natural advantages over its older rival, being nearer the mouth of the Humber, and in more direct railway communication with the principal markets,—facts which the fishermen and smack-owners were not slow to appreciate. Special accommodation was provided for fishing vessels, which now have two docks, covering an aggregate of twenty-three acres, and two graving docks, devoted to their sole use. The progress of the trade can in some way be judged from the Railway Company's returns: previous to 1854 there was little or no inland fish traffic; in 1854 the Company despatched 453 tons, in 1860 4537 tons, in 1870 26,234 tons, in 1880 43,415 tons, and in 1893 80,134 tons. An export traffic was also established, and reached about 3000 tons in 1877, but has not materially increased since that year.

It can well be understood that the development of the new fishing port was not viewed with any particular favour by its neighbour on the opposite bank of the Humber, and for many years the rivalry between Hull and Grimsby is said to have been keen and bitter, though nowadays it has no more than a merely formal existence. Hull has been gradually outclassed as a fishing station, not by any intrinsic decay, but simply by the extraordinary development of the Grimsby trade; it has merely had to take the second place in the deep-sea trawl and line-fishery of the nation, and shows no signs of relinquishing it for a lower one.

The Boston trawling industry is the most modern of all, since it was originated within quite recent years under the most modern auspices. There never has been a first-class smack trawl-fishery at Boston, doubtless owing to the intricate navigation of the Wash. This presents but little difficulty to steam-vessels, and the steam-trawlers, devoted to the deep-sea trade, in no way interfere with the pre-existing inshore fisheries.

The later developments of the North Sea trawl fishery can only be very briefly summarised. Boats found their way along the

Continental coast by gradual stages, opening up the grounds north of the Horn Reef about 1868. The liners, or codmen, seem to have been the pioneers in the exploration of the more central parts of the North Sea, since the Great Fisher Bank had been frequented by them for many years before it became a recognised trawling ground. I believe it was first trawled about twenty years ago, but has only been generally resorted to as a winter ground during the last ten years.

The Iceland grounds were also discovered by liners, and it was not until 1891 that they were first visited by a trawler. They have been worked, though not at great profit, by a certain number of steam-trawlers ever since; whether the fishery will continue is doubtful, but certainly the local authorities have done their best to discourage it. I have given rather a detailed account of the early condition of this fishery in the Association's Journal (vol. iii, 129), but, in view of recent developments, I fear that certain predictions I ventured to make will have only the average value of prophecy.

Chap. IV.—The Introduction of Trawling at a Northern Fishing Station, and its Influence on the Fishery.

In answer to my inquiries on the aspect of fishery matters at Sunderland, and on the past history of the industry at that port, my friend Mr. T. N. T. Potts has kindly drawn up the following sketch, which I make no apology for publishing *in extenso*.

"I am forty-two years of age, and have resided in the locality of Sunderland since childhood. The sea and the sea-shore are the first things I can remember, and as a child I took the greatest interest in its living creatures. My earliest knowledge of the fishing will date from about thirty years ago. At that time fishermen really were fishermen, their forefathers before them had been fishermen, and they brought up their families as fishermen. All did what they could; the girls and younger branches of the family sought bait, while the boys who were old enough went with their fathers to the fishing. In many cases the fishermen made their own lines and nets, during bad weather when they could not get to sea. At that time each family possessed their own 'cobles' (local boats, of which there are two sizes, the large herring cobles about 30 to 40 feet over all, and the small cobles about 20 to 30 feet over all used for line-fishing, crab, lobster, and salmon fishing), nets, lines, and gear sufficient to conduct the various kinds of fishing suitable to the

season. At this time stake-nets were allowed for salmon fishing, and many salmon and sea-trout were taken in this manner.

"At the end of the herring season (then about the end of September) they went to the Tees with their herring cobles for mussels, which they laid down in sheltered positions to form 'scarps' (a local name for mussel-beds) to last them over the winter; the herring cobles were then hauled up, and the line-fishing conducted in their small cobles.

"All bait was locally procured, and such a thing as sending away for bait was quite unknown. In the winter they prosecuted the haddock or small-line fishing, which was conducted comparatively near to the shore; this they did in small cobles, and it is thus managed:—Three men, or three men and a boy, have a coble amongst them. Each man provides what are termed two half-lines; each half-line is coiled up on a flat-shaped basket, and consists of six or seven pieces of line, each piece being 65 fathoms. The hooks are whiting hooks, and the fishing is for whiting and haddock, though not infrequently cod and ling of large size are taken in consequence of their having swallowed a whiting or haddock already hooked. These lines are baited with mussel, limpets, and sandworms, and, if possible, shot before daybreak, and the principal time for this fishing is from October to March.

"As the season advanced, the same cobles and crews would commence the long-line fishing, at which cod, ling, turbot, halibut, conger, skate, and other large fish are taken. Twenty years ago, skate were of no value, and were cut adrift as they came to the surface, and they were hooked in enormous quantities, so much so as to be a nuisance to the fisherman; but since steam-trawling has commenced, they have become very scarce, and a moderate-sized skate will sell at the fish-market for from 5*s*. to 7*s*.

"The lines used at the long-line fishing are much stronger, the hooks of course being larger and stronger also, and the fishing conducted at a greater distance from land. In the first place the small lines were shot as in the haddock fishing; the long lines were then got ready for shooting at the after end of the coble, and as the small lines were hauled in, the haddock, whiting, and other small fish would be used as bait for the large lines, which were shot over the stern as the small lines were hauled. The large and dead fish would be cut up into suitable sized baits; the live fish were hooked by the lip, thus forming a very attractive bait. The long lines were then buoyed, and left until the next morning. Of course this cannot now be done, as the lines would be swept away by steam-trawlers. The quantity of fish taken in this manner was immense, considering the amount of line then used, about five

or six baskets being as much as a coble could use, and I can well remember as a boy having often to throw out the ballast to enable the coble to carry the fish, which often amounted to several cart-loads, while now thirty baskets of line may be shot 100 miles off, for not a third the quantity of fish. On one occasion last winter while fishing with the 'Fingal' we shot twenty-four baskets of line 100 miles off the land, amounting to over 3000 hooks, each baited with a whole herring, and only caught eleven fish! Many other steam line-boats can give similar cases. Since the commencement of steam-trawling, this fishing has been abandoned by cobles, owing to the fish having become extinct on the inshore grounds, and to the impossibility of allowing lines to remain at sea overnight.

"At this time there were sailing-trawlers belonging to Hull and Grimsby, fishing on the Dogger Bank, and occasionally landing a catch of fish at Sunderland; and several sailing-trawlers were built and owned in Sunderland, and worked on the same grounds, and in the same manner as the Grimsby trawlers.

"These vessels did no appreciable harm to the inshore fishing-grounds, as they seldom if ever fished within fifty miles of the land.

"About twenty-five years ago, in the summer, owing to that year being exceptionally hot, and prevailing calms preventing them reaching their fishing-grounds, two of them, the 'Henry Fenwick' and the 'Fearnot,' were towed about the inshore grounds by the steam-tug 'Heatherbell,' and I remember having made several trips in them. The mode of working was as follows:

"The 'Heatherbell' would go to sea about noon, and join the two vessels from five to ten miles off the land, take them in tow, when they would shoot their trawls and be towed at an easy speed all night. The trawls would be hauled up at about midnight, and again about 6 a.m.; the 'Heatherbell' would then go to shore with their fish in baskets, and after it was sold, go off again with the empty baskets to repeat the same operation. This might have continued during the months of July and August, and as it was an exceptional occasion, and almost all the line-fishermen were engaged in the herring fishery, no opposition was offered by them at that time to this proceeding, and the practice was never again repeated to my knowledge.

"Many years afterwards, towage being slack owing to the increased development of screw steamers, several of the paddle-tugs, both on the Tyne and Wear, were fitted with trawls, and worked as trawlers on the inshore fishing-grounds.

"At first they caught a prodigious quantity of fish, and their temporary success was so great that every one was induced to embark in the enterprise. Old tug-boats completely played out, unseaworthy,

and unfit for further service as tug-boats, were bought up by persons with no knowledge of the business, and converted into steam trawlers. At first the supply of fish seemed almost inexhaustible, so great was the amount of fish landed, and for a time all went well; but after a year or two of this wholesale destruction the catches gradually diminished, so much so that many of them could no longer find profitable employment.

"This class of paddle-trawlers has gradually died out, there being few remaining at present owing to the fish within a reasonable distance from the land having been exterminated by continual trawling; their large coal consumption rendering them unprofitable for long runs. They have therefore been superseded by screw vessels, specially built for the purpose, and fitted with fish-holds and ice rooms to enable them to keep their fish a considerable time; and as the machinery of a screw vessel is much more compact and more economical in regard to consumption of fuel, they can go a much greater distance from land, and remain much longer at sea.

"These vessels have in their turn almost exterminated the fish on the Dogger and Great Fisher Banks, and several of them this year (1892) have landed their trawl gear, fitted out with lines, and worked at Faröe, &c., at the halibut fishing.

"The extermination of large fish on the inshore grounds has gradually introduced screw steam line-boats. At first paddle-tugs went into the venture, going off from twenty to twenty-five miles from land, and carrying the fish caught on deck; but as fish became fewer, necessitating their going a greater distance into the sea, they in their turn were superseded by screw vessels built for the service, and fitted with fish-holds, &c.

"This class of vessel is largely on the increase, and on the Tyne there is now a fine fleet of steam line-vessels, many of them going a great distance from land, some of them in the herring season catching their own bait, and at other seasons having herring bait sent to them by rail from Yarmouth or Scotland according to where the herring fishery may be.

"It seems as if the steam line-boat will in time supersede the steam-trawler, as they can be of less size and power, consequently less coal consumption; their fishing gear is less costly, the cost of a trawl and rope being from £100 to £150, while a set of lines can be had for about £40.

"A very much better price can also be obtained for line fish than for trawled, only healthy and well-conditioned fish being caught on lines, as sick and spawning fish seldom take bait.

"This steam fishing has of course greatly reduced the number of cobles formerly employed in fishing; at one time there was a

fleet of herring cobles at Sunderland, Shields, and Hartlepool, now there will not be more than twenty altogether, the herring fishing being almost entirely done by Penzance, Isle of Man, Scotch, Lowestoft, and Yarmouth vessels, who make the herring fishing a speciality, and follow the herring round the British Isles.

"There are now but very few fishermen in the old sense of the word, that is, where the whole family lived by fishing alone; but there are still a few cobles fishing with lines in winter, and catching crabs and lobsters in summer.

"Of late years mackerel seem to have entirely deserted this coast; at one time they were taken in large quantities by sweeping on the shore, but now they are seldom seen and only a few taken in herring-nets.

"Stake-nets were at one time allowed for salmon fishing, but now they have to be caught by drift-nets only."