

From: 'Fishing from the Earliest Times' by W. Radcliffe; Murray, 1921
Egyptians carrying a large fish

Fisheries in History

The tunny, the herring and the cod

C. M. Yonge

WHEN HE SURVEYED the shores and the shallower seas into which he might penetrate, early man must have been preoccupied with the possibilities of the food they contained. Vast kitchen middens composed of the shells of oysters and other molluscs, with fish bones and similar remains, bear impressive witness to the extent he relied on fish. In the words of a mid-Victorian writer, 'Fish being more distinguished for the size of their heads than for the amount of brains lodged in them and affording consequently an easier capture than either beasts or birds, fell easy victims to the crafts and assaults of their arch-enemy, man.'

Palaeolithic gorges (pointed bone rods) preceded the more sophisticated neolithic hooks of shell, flint or bone in the capture of fish. Traps of stone and probably of wickerwork early appear, and then harpoons with detachable barbed heads made from reindeer antlers or horn. Nets and baskets of primitive design still in use in the

undeveloped world have probably changed little over the centuries. There are Biblical references to fishing methods first depicted in Egyptian paintings around 2000 B.C. where the precise fish, such as the impressive Nile perch or species of *Tilapia*, African fishes now widely cultivated throughout the tropical world, are easily recognizable.

The first fisheries, confined to rivers or estuaries or along sheltered coasts, could only have been of local importance. But as navigation developed – and we are initially concerned with the Mediterranean – mariners and fishermen were to discover that the sea varies greatly in fertility in different regions, that certain fishes are excessively abundant, and that some of them, particularly those inhabiting surface waters, make extensive migrations, concentrating at particular times of the year in certain regions. Gradually it became clear that such movements were associated with feeding and with spawning.

These early impressions were later found true over wider and wider regions as western man explored the globe. As populations and the demand for food increased, control of the major fisheries assumed ever greater importance. The maritime nations of Europe fought about them on both sides of the Atlantic and the outcome of their struggles affected the history of both Europe and America. More, of course, than fish comes from the sea, notably the marine animals – whales, seals, sea cows and sea otters – many of which provide for human needs other than food. Their search and capture has also affected history, but attention is restricted here to fish and to only three of these, each of supreme importance, the tunny, the herring and the cod.

The Mediterranean tunny is a magnificent fish, attaining lengths of up to twelve feet and reaching hundreds of pounds in weight. The skin is stretched tightly over the rotund and streamlined body. Dark red flesh carries the oxygen needed for an incessant activity that raises the body temperature appreciably higher than that of the surrounding water. With relentless vigour, tunny pursue their prey of smaller fishes and squid.

These great fish fascinated the Greeks. Aristotle, first and among the greatest of marine biologists, has much to say about them. In his (mistaken) opinion, and the story is repeated by Pliny, the tunny came annually from the Atlantic to proceed along the north coast of Africa and through the Dardanelles and Bosphorus into the Black Sea to breed in the Sea of Azov. Later, they were said to return hugging the southern coast of Europe – this preference for keeping land on the right side attributed to better sight by the right eye! They moved in impressive numbers, Pliny telling how the fleet of Alexander the Great was only able to proceed 'by facing them in order of battle, just as it would have done an enemy's fleet. Had the ships not done this . . . they could not possibly have made their escape. No noises, no sounds, no blows had any effect on these fish; by nothing short of the clash of battle were they terrified, and by nothing less than their utter destruction were they overpowered.'

Headlands were identified past which the great shoals of tunny annually passed. Here nets were

fixed to divert and then entrap them, nets which over the centuries evolved into the French *madrague* or Italian *isola*, walls of netting separating a series of compartments, the final one a 'death chamber' where the fish were butchered – a procedure of such ferocity (as it still is) that Aeschylus compared to it the slaughter of the Persians at Salamis.

Careful watch was maintained when shoals were due. Mention in the Bible of the watchman on the hill overlooking the sea may refer to this. The Greeks constructed stagings of cross-connected tree trunks from which came the tall inclined ladders, the *Thynnoscopi* or *Ichthyoscopi* described in a book on the fisheries of the Adriatic in 1885 by G.L. Faber, then H.M. Consul in Fiume; a book dedicated, it is interesting to note, to his fellow consul at Trieste, Captain Richard Burton.

The proximity of such fisheries influenced the sites of both Phoenician and Greek colonies; Sidon and Carthage, Syracuse and Marseilles, were all established near great tunny fisheries, and there were further fisheries outside the Mediterranean near Cadiz. Early medals from Carthage and Cadiz portraying tunny emphasize a local importance that has since become world-wide. Different tunnies are now widely hunted in the open waters of the great oceans, caught by unbarbed hooks or, largely by the Japanese, with buoyed lines many miles in length. Tinned tuna is now a major commercial product.

From the earliest beginnings of such fisheries there was more to them than discovery of the fish and elaboration of the means of capture. Fish is a highly perishable commodity, the flesh rapidly penetrated and spoiled by bacteria. Great quantities taken in the few weeks of a transient fishery were useless unless the fish could be preserved for later consumption and for transport to distant markets.

As with so many of the basic activities of mankind, first attempts at fish-preservation go back far before the beginnings of recorded history, the result doubtless of accident rather than design. In the hot dry climate of countries such as Egypt, fish could be temporarily preserved by exposure to the sun, dried fish being possibly the earliest of preserved foods. In colder and wetter climates,

drying was conducted in the smoke of fires, doubtless in the caves that formed the earliest human habitations. Such simple methods of preservation are to be viewed today along coasts and lake shores in Africa and Asia.

The use of salt came later, probably not until man changed from a hunting to an agricultural economy, when salt became an essential article of diet and served other functions, including the salting of fish. By experience – there was no other guide – it was found that some fishes, and this comprises those that feed in the surface waters like tunny and herring, were too oily to be dried when they became rancid and uneatable. The Egyptians appear to have been the first to overcome this by immersing such fishes in salt brine which prevents entrance of the oxygen responsible for the rancid condition as well as of bacteria. Such technical processes were the concern of priests who were also responsible for embalming the dead.

Fish cured in these various ways, drying, smoking, salting or by a combination of them, became a staple product in the Mediterranean as far back as the sixth century B.C. Vessels traversed the Black Sea carrying dried and salted fish to the cities of Greece. Jars of pickled fish were among the most welcome trophies encountered in abandoned villages by Xenophon and the Ten Thousand during their retreat along the southern shores of that sea. This trade developed greatly during Roman days with Sicily, Sardinia, Tarentum and Cadiz (Gades) major sources of supply. Jars of salted tunny (*salsamentum*) had a particularly high reputation.

Salt becomes of supreme importance. What could be produced in Mediterranean coastal pans by solar evaporation had to be mined in colder climates or produced by evaporation of brine over smouldering logs, the final product mixed with ashes and black. Pliny is full of information about the various sources and innumerable uses of salt, notably in prevention of putrefaction. A much prized liquid, known as *garum*, was prepared from the intestines of fish that had been macerated in salt.

After the decay of the Roman world, a cruder civilization gradually became established in northern Europe and attention passed from the

Mediterranean tunny to fish that dominate boreal waters, and first to the similarly surface-living herring. Much smaller but in vastly greater numbers than the tunny, herring resemble that fish in motility and predictable annual appearance. Shoals containing countless millions occurred in the North Sea, around the coasts of Great Britain and penetrated to varying extent into the Baltic. We do not know how herring were first caught, but possibly it was by means of seine nets from the shore. As boats became larger, these may gradually have evolved into drift nets, walls of netting buoyed along one edge and weighted along the other which were 'shot' across the line of movement of the fish which, swimming into them, literally catch themselves. How soon such methods developed we have no idea, although evidence for the existence of the East Anglian herring fishery goes back to the seventh century and it could be much older.

For centuries the prosperity of the maritime peoples of northern Europe was largely dependent on the exploitation of this fabulously abundant fish. Viking raids and settlements into the North Sea and around the north of Scotland into the Irish Sea may have been forays after food, with herring as a prime factor. Such was the view of S. M. Toyne in his article on 'The Herring and History' published in the second volume of *History Today*. While this remains a possibility, we pass to the certainties of history with the Hanseatic League. This federation, largely of northern German cities centred at Lubeck, dominated trade in northern waters between the thirteenth and fifteenth centuries, its power based primarily on control of the herring fishery in the Baltic. The League did not engage in fishing, but controlled fisheries that extended into the Baltic as far as the island of Rügen. The major centre was at Scania on the island of Skanör at the southern point of the Scandinavian peninsula, at that time within the kingdom of Denmark.

This fishery lasted from mid-August until into October with fishermen coming from far and wide and living in temporary wooden huts. Fish were caught near the coast and landed daily, to be purchased and cured by Hansa merchants. Everything was strictly controlled by the Danish state and by bailiffs representing the Hanseatic



From: 'Fishing from the Earliest Times'

Cutting up tunny; an illustration from a Greek wine-pitcher, sixth century B.C., now in Berlin State Museum

towns, each of which had its own camp, including a length of shore off which the herring boats anchored and along which the fish were unloaded. Only there could merchants purchase herring, which were gutted by women, after which they were 'roused' in salt, then packed with salt in barrels, the contents allowed to settle before closure. The entire process was controlled and the final product inspected. Up to 50,000 barrels might be produced in the season.

Not surprisingly there were frequent riots among the motley assemblage of fishermen and curers; and major battles were fought largely between Germans and Danes. In his book on *The Herring and the Herring Fisheries*, J. Travis Jenkins gives a vivid account of the dense accumulations of people crowded into largely temporary buildings, 'Dozens herded into every wooden hut, unable to change their clothes for

weeks at a time, and living almost entirely on animal food . . . The work of gutting, cleaning, salting and packing the herring into barrels, the utilization of waste for the preparation of oil, was carried on everywhere, and scattered around were debris, fragments of fish and foulness of all kinds. On warm days flies, bacilli and foul smells made the neighbourhood unbearable to those not accustomed to it.' This was an occupation only for the most hardy.

It was also one of high significance throughout the Middle Ages and later, with salt herring a supreme source of preserved food. Armies depended on it; it maintained those of Gustavus Adolphus, possibly tipping the scales of victory in the Thirty Years War. It supported life in beleaguered garrisons; monks in their monasteries; and princes in their castles depended on it. The Hanseatic towns controlled all.

But the herring were to leave the Baltic. The reason for this is debatable, although the Swedish oceanographer, O. Pettersson, believed it was due to long period tidal oscillations, more saline water with herring alternately penetrating into and then withdrawing from the Baltic. Whatever the reason, the herring fishery declined and with it the power of the Hansa towns, already threatened by the Dutch who had established themselves in the Baltic at the Peace of Copenhagen in 1440. But the fisheries they were to dominate were those in the North Sea and around the British Isles.

Dutch success was due to improved methods of preservation attributed to George (or William) Benkel or Benkelen, born in Sluys in the middle of the fourteenth century, a 'barreler of herrings' reputedly responsible for the 'Dutch cure of herrings', a surprisingly long-kept secret that, backed by adequate force, ensured success during the next three centuries. These saw the successful revolt of the United Provinces, creation of a mercantile marine three times the size of that of the rest of Europe, and a navy that crushed the Spaniards and the French and was to sail up the Medway in 1667.

The greatest sustaining factor was the herring fishery, 'every movement of the Dutch fishing fleet', we are told, 'and every operation on board was fixed by law, precise sailing instructions being issued annually by the College of the Herring Fishing.' Fishing began in June around the Shetlands and north of Scotland, culminating off East Anglia in September. Some 20,000 sailors manned a great fleet including hundreds of great 'busses' of up to 100 tons and guarded by warships.

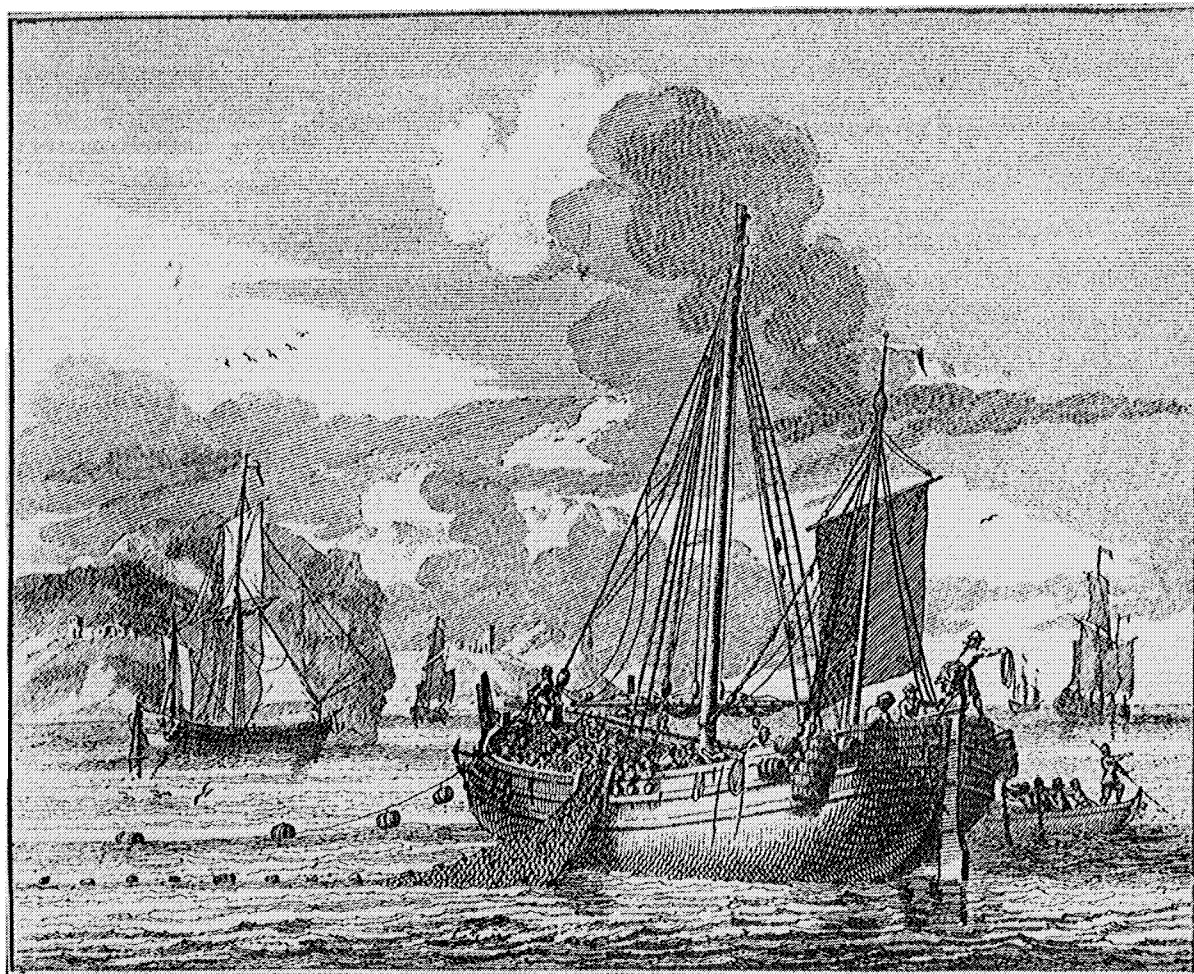
This invasion naturally provoked response. James V of Scotland fought the Dutch on this issue between 1532 and 1551, and his great grandson, Charles I, took steps to prevent flagrant exploitation of the East Anglian fisheries. Dutch fishing was prohibited off English coasts and several busses captured, the Dutch then sending warships to protect their fleet of some 1,600 vessels. It was the imposition of Ship Money – with its momentous consequences – that financed the fleet which established British rights and began the long series of actions and reactions, Navigation Acts and repeated Dutch wars, during

the Commonwealth and Restoration. Dutch naval power waned, but their control of the herring fishery persisted until about the middle of the eighteenth century when bounties were given to British companies and ships which, although they were withdrawn in 1771 in Scotland and some sixty years later in England, consolidated British control. A great export trade in herring grew up which persisted until the first World War, but today the once great East Anglian fishery is dead, although the Scottish herring fisheries remain a national possession of increasing value.

About the time the herring left the Baltic, the more northern cod assumed increasing importance. Intermediate in size between tunny and herring, it is totally different in habits, living and feeding on shallow banks and making annual movements well below the surface to and from its spawning grounds. It is the commonest fish in the north Atlantic; it is not oily and in a dry climate can be sun-dried, which is how Norwegian fishermen treated fish caught around the Lofoten Islands for sale as 'stockfish' to the Hansa merchants at Bergen. In the fifteenth century cod-fishing developed on the teeming banks around Iceland, attracting fishermen in two-masted vessels from Scarborough, Cromer and Bristol, each returning with around thirty tons of dried and salted cod. The fishermen were welcomed by the Icelanders, in those days happy to share apparently unlimited harvests.

John Cabot, a Genoese in the service of Henry VII, sailed across the north Atlantic in 1496 in the hope of finding a northwest passage into the Pacific. Before making landfall on Cape Breton Island, he sailed over the wide area of shallow banks stretching from Newfoundland to New England, over which the cold waters of the Labrador Current mingle with the warmer waters of the North Atlantic Drift. In these mixed waters a rich surface life is carried down to support a dense bottom population, in turn providing food for immense stocks of cod.

Cabot had discovered one of the best fishing grounds in the world, on return to Bristol reporting that 'the sea there is full of fish to such a point that one takes them not only by means of a net but also with baskets to which one attaches a stone to sink them'. These were richer grounds



From: 'The Herring' by A. M. Samuel; Murray, 1918

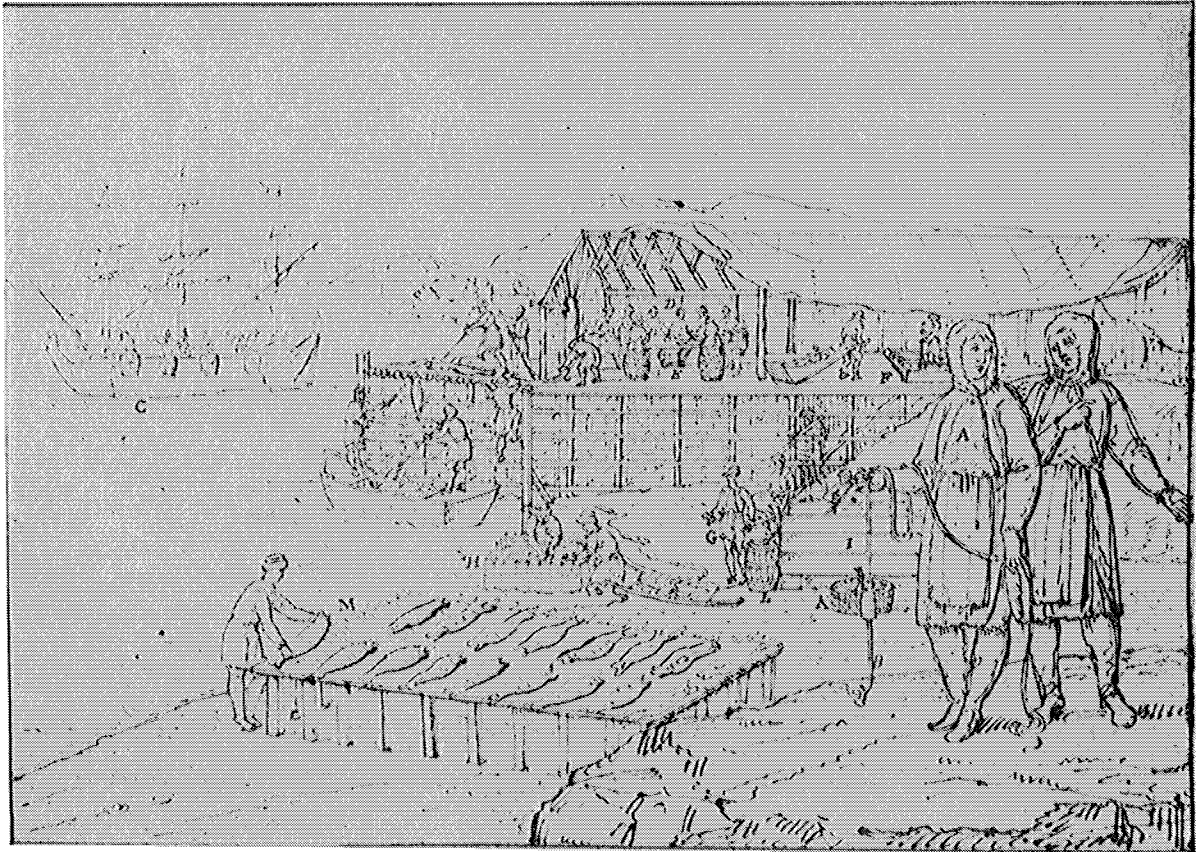
A hulk, or great hoy, herring fishing; an engraving of 1792

even than those of Iceland and very soon English fishermen were sailing to the Newfoundland Banks rather than northward for cod. They had probably been preceded by Basques and Bretons and not improbably by the Portuguese – indeed an expedition from Lisbon led by Gaspar Corte Real may have been responsible for the first landing on Newfoundland.

This great island was for long no more than a convenient base, a source of shelter, water and timber. Salt was carried there, but food and bait were collected locally, in part from the immense populations of great auks or garefowl, flightless sea birds, here half way between their breeding

grounds off Iceland and their winter quarters along the coast of North Carolina. This defenceless bird, now represented by a few stuffed specimens and some eggs, was gradually reduced below the possibilities of survival, the last individuals apparently killed in Iceland in 1844. Although not an event in human history, this is a major tragedy in the far longer history of evolution.

With their source of cheap solar salt, the French and Portuguese exploited the bank fishery, catching the fish by hook and line and preserving them 'wet' or 'green', that is in barrels with salt for later drying on return to the home port.



By courtesy of the Trustees of the British Museum

Cod-fishing factory on the coast of Newfoundland; a drawing of 1715

Below: Cod being laid in piles to dry with salt sprinkled between each layer



From: 'Traité général des pêches' by H. L. Duhamel Dumonceaux; Paris, 1772

Without such supplies of salt, the English needed drying facilities on land and so tended to exploit the inshore fisheries and to establish seasonal encampments where less salt was needed because the fish could be dried. The process is described by James Yonge of Plymouth during the season of 1662, when he served as surgeon on the *Reformation* of 100 tons with a crew of seventy. A base was established near Cape Race where the ship was unrigged and a staging and temporary houses erected while fishing proceeded from small boats. Fish were thrown on to the staging, split open and laid in neat piles with salt spread on each row, a skilled operation because too much salt was as harmful as too little. Later the fish were washed and dried, the salt 'sweated out' and so transported. All was abandoned at the end of the season; there was no permanent settlement on Newfoundland until 1603.

So a great international fishery came about, to be further developed by the American colonists, particularly from Gloucester in Massachusetts, a period when, in the words of H. A. Innis in his book on *The Cod Fisheries*, 'a thousand miles of misty sea competed in importance with the produce of the land mass of north America'. There hangs to this day in the House of Representatives at Boston a representation of a cod fish 'as a memorial of the importance of the cod-fishery to the welfare of this Commonwealth'. Salt cod became an article of commerce rivalling and then excelling the herring and over a wider area. Cod became an essential article of diet throughout the Catholic countries of southern Europe, also in Greece, and during the eighteenth century increasing quantities of usually inferior fish were exported to the West Indies for feeding the slaves working on the sugar plantations, and the more these were exploited the greater grew the need for slave labour and so for dried cod. European fortunes based on sugar, the greater number in Great Britain, were in large measure dependent on Newfoundland cod.

Just as French and British competed in the West Indies so they did off Newfoundland. During the reign of Charles II, the French established a settlement at Plaisance not far from St John's, only to be expelled during the War of the Spanish Succession when they were left with

the Islands of St Pierre and Miquelon (held to this day), with their sea power based on Louisbourg on Cape Breton Island. Rights for fishing and drying were recognized along the 'French Shore' extending around the north-eastern and western coasts of Newfoundland and the opposing coast of Labrador. At the end of the Seven Years War in 1763, the French lost everything except the two islands and the shore rights. But reoccupation was deliberately delayed until James Cook, Master of the *Antelope*, who had previously surveyed the St Lawrence ahead of Wolfe's army, charted the coasts of St Pierre and Miquelon, the first stage in the survey of the coasts of Newfoundland he conducted between 1763 and 1767. The qualities of leadership and exactitude he revealed during the course of these surveys were directly responsible for his selection to command the *Endeavour* on the Transit of Venus Expedition in 1769, and then the *Resolution* on his two subsequent voyages. In this indirect but highly significant manner did the Newfoundland cod fisheries influence the history of Pacific discovery.

Subsequent history of the French fishery has less of dramatic import. At the end of the American War of Independence, the French were allowed to fortify their islands and the fishery increased until 1792, not to be resumed until 1815. Difficulties increased after Newfoundland became self-governing, and the rights along the French Shore were abandoned in 1904. But there was never any cessation in the bank-fishing and cod continues to be intensely sought by Canadians, Americans, French, Portuguese, Spaniards and, more recently again, by British and then by Russian fishing vessels.

The produce of the sea, tunny, herring, cod and hundreds of other food fishes, notably the anchovies of the Humboldt Current, the exploitation of which has given Peru primacy amongst the fishing nations, is collected by increasingly sophisticated methods and now largely preserved by refrigeration. Control of offshore waters, as much for their food content as for the more transitory accumulations of minerals and oil below the sea bed, is an increasing preoccupation of governments and at present the subject matter of a series of United Nations conferences on the Law of the Sea.