

I.—HISTORICAL OBSERVATIONS ON THE CONDITION OF THE FISHERIES AMONG THE ANCIENT GREEKS AND ROMANS, AND ON THEIR MODE OF SALTING AND PICKLING FISH.

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If it is interesting to follow the great and rapid progress which pisciculture has made and is still making in our times, it is, on the other hand, of no small importance to go back through the ages and inquire into the position which this sister of agriculture held in antiquity, especially among those two great nations, the Greeks and Romans concerning which we have the most accurate and ample information in the writings of their poets, historians, and scientists. Although this rich and almost perfect literature is known, at least in part, to many persons through the study of the classical texts themselves, and by means of more or less faithful translations of the same, but few, perhaps, are aware of the fact that a large portion of these writings treats of the life of the seas. They describe its inhabitants and their mode of living, and inform us that in those times fish were used as an article of food, or put to medicinal and other uses. It would be a great mistake to suppose that we would find a few obscure names only, as having discussed this subject; on the contrary, they begin with Homer, and are found throughout the entire wide range of classic literature.

If any one should ask for the reason of this ardent attachment of the ancient writers for the sea and everything connected with it, the best answer will be found in Buffon's Natural History of Fish, where this famous natural historian says: "Fruitfulness, beauty, and long life are essential characteristics of the inhabitants of the ocean." This is the reason why Greek mythology, which, so far as regards the ultimate cause of its imagery, was much better informed than we usually suppose, and which produced ideals of undying beauty, placed the cradle of the goddess of love and beauty in the ocean, and represents her as springing from the foaming waves surrounded by her sacred fish, glittering with gold and azure. This allegory, as beautiful as it is instructive, is by no means astonishing, for we find that the ancient Greeks had observed the

* Nogle historiske Bemærkninger om Fiskeriernes Tilstand paa Grækernes og Romernes Tid samt om de dengang brugte Tilberedelsesmaader af saltet og marineret Fisk. Af J. K. Smidth. < Tidsskrift for Fiskeri. Udgivet af H. V. Fiedler, og Arthur Feddersen.—6te Aargang. Kjøbenhavn. Jacob Erslovs Boghandel. 1871. pp. 34-62.

habits of fish more closely than those of any other animals. They were not only familiar with them, but they preferred them as food even to the choicest poultry. The modern Greeks inherited from them this love of the sea and its inhabitants, and still preserve it; while the Romans, weighed down beneath the most cruel despotism, the most fearful immorality, and the most insane luxury that ever disgraced a noble nation, still clung to their love for the inhabitants of the deep. It is by no means improbable that they inherited it from those ancient nations of the East, among whom these characteristic traits may still be observed.*

The nearness of the coast, and the nature of the sea which surrounded their country as it did on almost every side, naturally inspired them with a love for ocean life; and it may well be said, "that this circumstance is more closely connected with the progress of civilization than is usually supposed. We find that it vanishes completely first in those unfortunate portions of Europe and Asia where barbaric hordes of wild hunters, issuing forth from their northern forests, succeeded by their numbers and fierceness in changing the customs and ideas of the conquered nations."

These words of Buffon form the theme and starting-point for the following observations, which are partly taken from ancient Greek and Roman authors themselves; partly from more recent writers, such as Paul Jovius [Giovio], Aldrovaudi, Petrus Artedi, Gesner, Buffon, Sabin Berthelot, and partly from the very able writings of Noël de la Morinière, of Rouen, on this subject.

The archetypes of our modern fishing implements, the net and the line, have been known and used throughout the whole world from times immemorial. In Homer we find the fisheries in a flourishing condition, and he frequently takes his similes from the art which, in all probability not only the twin-sister of agriculture, but together with hunting, constituted the first mode of securing subsistence in the earliest days of the human race. In the *Odyssey*, *e. g.*, Penelope's sighing lovers are compared to the fish gasping on the shore, where the fisherman's net has been emptied. Hesiod places on the shield of Hercules a fisherman on his lookout, ready to cast his net over some of the finny tribe which are pursued by a dolphin.

The ancients knew as well as we that certain natural advantages, wisely managed, would open up new and remunerative lines of business. Hence, the Greeks developed their fisheries to such a degree as to enlist a large amount of physical and mental exertion, and they gradually became one of the most remunerative of occupations. Large salt-

* During my stay in Paris, I had a long and interesting conversation with the Chinese minister, and was astonished to hear how far advanced the Chinese are in pisciculture, especially as regards the breeding and raising of fish. They also seem to have a great many fishing implements which are unknown to us. He finally assured me that M. Coste (the great French pisciculturist) himself might learn a good deal by traveling to China, an opinion which was strongly corroborated by his secretary, a Belgian.

ing-houses were established in favorable places, round which soon rose a constantly increasing number of fishermen's huts. These again attracted artisans and merchants, so that the village soon grew to a city, of which the fisheries might be called the nucleus. Of such cities there was a large number, Byzantium and Sinope being illustrious examples. It is well known that the wealth from fish gave to the sea near the former city the name of the Golden Horn. "Proud and beautiful Venice" is of later date, but of similar origin.* Many private individuals rapidly accumulated large fortunes by dealing in salt-fish, and the ancient writers of comedies frequently make such a trader (Keriphilos by name) the object of their raillery. This man, it seems, had been honored with the Athenian citizenship, but his son, by a life of dissipation, soon spent the fortune which his thrifty father had amassed.

We are acquainted with about four hundred different names of fishes, which have been described by Greek authors. "This abundance of words," says Buffon, "this wealth of exhaustive and accurate terms, presupposes the same abundance of ideas and knowledge. Is it not evident that nations, who had fixed the names of many more objects than we, must naturally have known a great many more?"

From what Aristophanes and other dramatic writers tell us of the mode of living among the ancient Greeks we know that in their time fresh and salt fish formed a very important article of trade. Athenæus quotes about two hundred passages of authors, whose works are now lost, in which different ways of preparing and preserving fish are mentioned. Xenocrates, Æschylus, and Sophocles did not consider it beneath their dignity to speak of very tempting bills of fare; and Arcestratus, who assisted Epicurus in seeking the qualification of the senses, seems to have described a great many such in his poem, "Dipnologia," a most amusing and excellent cook-book, whose loss is still deplored by modern gourmands. In the city of Athens the government, in its paternal care, even went so far as to make a law obliging fishermen as soon as they brought their fish to the market to sound a gong, so that everybody might buy fresh fish. We are also told that fishmongers, in order to sell their stock more rapidly, were not allowed to sit down, but required to stand during the time fixed for selling.†

That fish formed a favorite article of food in those times, is clear from the fact that great importance was attached to their fisheries. But other considerations also tended to increase their interest in the success of the fisheries. Fleets, as is well known, played an important part in all of the wars of those ages. It was often a matter of considerable difficulty

* Regarding the remarkable fish-colony, Commachio, compare the work by M. Coste, "Voyage d'exploration sur le littoral de la France et de l'Italie." Paris, 1861.

† This law seems to have been known in Vienna in the fifteenth century. At any rate, there has been found in the archives of that city an ancient decree ordering the fishermen to sell their fish standing and bare-headed, exposed to the scorching rays of sun and to storm and rain, thus forcing them to sell their fish speedily and at a reasonable price.

to find sailors sufficient to man them, and especially experienced sailors. It was, therefore, a matter of great importance to the governments of Athens, Sparta, and other states, that the fisheries should be encouraged, especially the sea-fisheries, which, in our days also, are considered the best nurseries of sailors for the navy.

We must also take into account the fact that the greatest wealth of Greece grew out of her colonies. To maintain an intimate connection with these was of the utmost importance; and for this end, also, the fisheries were especially useful, since along the coasts of these colonies all those fish were caught which move in schools. These fish formed an important article of trade, not alone for the colonies, but also for the mother-country, so that the former were necessarily dependent upon the latter. The article for which there was the greatest and most widely-spread demand, was salt-fish. All historians of that period agree in laying stress on the great importance which this article held in commerce, even before the time of Alexander, and during the last centuries of the independence of Greece.

But after wealth increased, and luxury and effeminacy took the place of the original simplicity of life and manners, the fisheries developed an inexhaustible supply of new articles of food, and the Black Sea (*Pontus Euxinus*) and the Sea of Azof (*Palus Mæotis*) became what the banks of Newfoundland were to the maritime states of Europe during the first centuries after their discovery. Besides fresh fish, dried and salt fish, oil, glue, and a number of other articles, prepared in an ingenious manner from the roe and the intestines of fish and of other animals living in the water, as also a large number of peculiar kinds of medicine, prepared from them, became the objects of large and extended mercantile enterprises; and all these were often sent, at an enormous expense, to the most distant portions of the then known world. Hence it was that the fisheries constantly increased in importance, so that thousands of slaves became educated as sailors and fishermen.

But the fisheries of Greece could not save her from decay. There arose in Italy a new nation whose fixed purpose was to subdue the world, which it ultimately accomplished. Rome, nursed by a wolf, never renounced its wolf-nature. First, it ravished its neighbor's daughters in order to secure wives; then their sons, in order to secure slaves; and, finally, it carried its eagles over the beautiful land of the Greeks. But Rome was practical, and its rule proved an advantage to the fisheries. The most important question was how to raise sailors for the fleet. The number of fishermen was not sufficient, and the crews of the Roman galleys consisted more of rowers than of sailors; but the latter were in great demand, as they were more familiar with the element where battles were to be fought.

Not only politics, but religion also, proved advantageous to the fisheries, for the Licinian law decreed that on certain days of the year salt-fish only could be eaten. The fishermen had also their special festival, which was celebrated with great pomp on the 3d day of June.

The Romans, like the Greeks, carried on their fisheries partly along the coasts and partly in the open sea. A large number of fishermen's societies had been organized, which fitted out large vessels and sent them on long cruises all over the Mediterranean, and even beyond the Pillars of Hercules, up and down the coasts of North Africa, Spain, and Portugal. They well knew how to make use of favorable weather, and were familiar with the best hours for fishing by day and by night; as, for example, just before the rising of the sun and the moon, and just after their setting.

The most ordinary fishing-implements were the harpoon, the line, and different kinds of nets and seines. It will thus be seen that fishermen in our time are not so very far in advance of their ancient brethren, although of course these implements have been somewhat improved during the progress of ages.

Noël de la Morinière gives the following account of the method of fishing with lines: "The lines were generally made of horsehair, single, double, and plaited. The hair of horses was preferred to that of mares, and black hair was not esteemed as highly as white. According to Ælianus, the hair was colored in different ways. The fishing-pole was chosen with reference to the supposed weight of the fish to be caught and the resistance it could offer. The hooks, which were of copper or iron, covered with tin, were single, or composed of several branches, and of different thickness. If fish were to be caught having sharp teeth, and hence able to injure the line, it was surrounded just above the hook with a covering of horn or some other hard substance, *e. g.*, copper. For catching sharks, or similar fish, iron chains were employed. Many details concerning these implements are found in the works of the ancient writers." (*Histoire générale des Pêches*, p. 188.)

Special care was taken in the selection of bait for line-fishing. The most common bait was small fish, larvæ, worms, or insects; sometimes, also, the lungs and liver of hogs and goats, shell-fish, and polyps; and even at times the entrails of animals which had been saturated with an extract of myrtle and other odoriferous plants. Oppianus, and, after him, Cassianus Bassus, as well as other writers in the time of the emperors, have described a large number of different kinds of bait. They were prepared to suit the tastes of the different fish. Thus the "aurata" was caught with almonds and the sword-fish with mullets. Oppian says that the "lycostome" (a sort of herring) was the best bait for catching the "sargus." As soon as a certain quantity had been thrown into the water they came in large swarms to eat it, and the fishermen then seized the opportunity to inclose them in their nets, and thus frequently caught large numbers.*

* This use of bait in net-fishing reminds us of the sardine fisheries on the coast of Brittany, as carried on in our own time. But here the roe of the cod-fish is used as a bait for the sardines. To give an idea of the enormous quantity of roe used for sardine-fishing, I will only mention that 30,000 kegs of roe are exported annually from

The Romans also used artificial baits; and the art of making flies of feathers and other materials has, perhaps, never been carried further in our time even in England itself. Fishing by torch-light was a favorite amusement, and several ancient authors describe this mode.

There were peculiar methods of net-fishing, which we have only imitated or somewhat developed. Hemp, flax, and Spanish reeds were used for the manufacture of these nets, which were afterward tanned several times in order to make them stronger. The fishermen set them both along the coast and in the open sea. Drag-nets, which were first used by the Greeks, served for inclosing the large schools of migratory fish, and the stationary nets stopped them in their course. These latter were very large, and were made of a kind of plaited work of Spanish broom. Permanent nets of this kind were soon used at the mouth of the Bosphorus, on the coasts of Italy, Sicily, and Sardinia, especially in the Ligurian Sea, the Bay of Naples, the straits of Bonifacio and of Messina, at the entrance of the Adriatic, the straits of Cadiz, and along the coasts of France and Spain. Strabo makes especial mention of the large stationary nets on the coast of the island of Elba.

The four hundred names of fish spoken of by Greek authors are given in alphabetical order in the work of Aldrovandi, who, also, gives alphabetical lists of fish in Latin, Italian, French, German, and English. Similar lists are found in Gesner, Artedi, and other authors. Those who desire further information on this subject are referred to the works of those ichthyologists. But to enable the reader to form some idea of the numbers and kind of fish known in those times, the following list is given, in which those groups and families are mentioned which were most numerous in the Greek and Latin seas. Each of these groups, therefore, comprises a considerable number of important species, to enumerate which would lead us too far from our special theme. In this list Lütken's system has been followed:

FIRST ORDER.

a. The perch group.—Red mullets (*Mullus*); breams (*Sparus*); sciænoids (*Sciæna umbra*); and white mullets (*Mugil*); besides quite a number of labroids (*e. g.*, the parrot-fish, *Scarus*, and other similar fish.)

b. The toad-fish group.—1, gurnards (*Trigla*); 2, frog-fishes, *e. g.*, the angler (*Lophius piscatorius*); 3, gobies (*Gobius*); 4, blennies (*Blennius*); the sea-wolf (*Anarrhicas lupus*); 5, codfishes (*Gadus*), and especially the "*Asellus*;" 6, flounders (*Pleuronectes*); and among these the turbot (*Pleuronectes rhombus*), plaice (*Pleuronectes limanda*), sole (*Pleuronectes solea*), &c.

Norway to France. Each of these kegs contains about 140 kilograms, making a total of about 4,500,000 kilograms, or about 9,000,000 of pounds, valued at about 3,000,000 francs. Several owners of large fisheries have assured me that the buying of this roe deprives them of half the profits of their sardine-fisheries.

c. *The mackerel group*.—The mackerel (*Scomber scombus*); the tunny (*Scomber thynnus*); the scad (*Caranx trachurus*), and the swordfish (*Xiphias*).

d. *The pipe-fish group*.—The sea-horse (*hippocampus*).

SECOND ORDER.

a. *The carp group*.—The common carp (*Cyprinus carpio*); the tench (*Cyprinus tinca*), and the loach (*Cobitis*).

b. *The eel group*.—The common kinds of eel and the sea-eel (*Anguilla*, *Conger*).

c. *The salmon group*.—Nearly all kinds.

d. *The herring group*.—Especially the anchovy (*Engraulis encrasicolus*).

THIRD ORDER.

a. *Sharks (squalus)*.—The dog-fish (*Scyllium canicula*); the blue shark (*Galeus vulgaris*); and others.

b. *Rays (raja)*.—The saw-fish (*Pristis*); the cramp-fish (*Torpedo*).

FOURTH ORDER.

Lampreys (Petromyzon).—The river lamprey (*Petromyzon fluvialis*), and the sea-lamprey (*Petromyzon marinus*).

Besides these fish, whales, dolphins, lobsters, crabs, oysters, various kinds of shell-fish and other sea-animals, that came within the scope of the fisheries, are mentioned, and ought therefore to be noticed in this place. In the following pages some of the most important fish, as well as the mode of fishing for them, &c., will be mentioned; then the salting of fish; and finally we will see what Pliny says about the artificial fish-ponds, which will naturally lead us to speak of lobsters, oysters, shell-fish, &c.

THE MULLET.

The mullet (*mullus*) was a great favorite with the Romans. Horace says, "You praise, O fool, a mullet of three pounds, which you are obliged to cut into several pieces;" and Martial praises the mullet, saying, "The mullet of four pounds, which you had bought, was the chief attraction of your feast," (*cæna pompa caputque fuit*).*

Noël de la Morinière tells us in the following words to what length the Romans carried their passion for mullets:

"The mullet was one of those fish that were most sought for in degenerate Rome, and it was made the subject of the most refined sensual enjoyment with the emperors and the aristocracy, who had become thoroughly depraved by the extravagant use that was made of the world's plunder. It is difficult for us to realize the enormous value which the Romans placed upon this fish, for as it never reaches

* Martial, Epigrams, x, 31.

any great size, they did not hesitate to pay its weight in gold if it was unusually large. Seneca and Suetonius have given us, in their writings, descriptions of the extravagant taste in the preparation of the mullet for the table of the rich. We read there how each guest, with the most refined cruelty, looked upon the mullet destined for his own dish, die before him, in order to enjoy the rapid change of brilliant hues which the fish then exhibited. The wildest fancies that the most extravagant luxury could imagine were realized in preparing it for the table. The freedmen who were intrusted with the preparation of the mullet enjoyed the greatest privileges, and a good cook was often better paid than a good general. Mulletts were served on dishes lavishly adorned with precious stones, and the most costly spices were used in cooking them. During the reign of Heliogabalus, extravagance reached such a height that this emperor, who had become tired of mulletts, although at that time they were growing scarce, ordered (according to Lampridius) a dish to be prepared consisting of nothing else but the mouth-fibers of mulletts. It may well be imagined what an enormous quantity was required to satisfy this morbid taste.

“Mulletts from the straits of Gades (the straits of Gibraltar or the straits of the Pillars of Hercules) enjoyed the greatest reputation.

Dat rhombos Sinuessa, Dicarchea littora pagros,
Herculeas mullum rupes . . .

“Scarcely less famous were those from the sea around Sicily and Corsica. According to Seneca, (epist. 95,) the Emperor Tiberius sold at auction a mullet, weighing four pounds, to Apicius and Octavius jointly, for the sum of 4,000 sesterces, (\$156.) This fish, which can easily be recognized, is very frequently represented on the fresco paintings which have been dug out from the ruins of Herculaneum and Portici.”

Though not exposed to the same cruelties as the mullet, there was another fish which almost equaled it in costliness:—

THE SCARUS.

The scarus, a fish of the labroid family, was, according to Pliny, (Hist. Nat., ix, 17; xxx, 10,) originally found only in the Ægean Sea. But in the time of the emperors, when the simplicity of former days degenerated into extravagance and luxury, the wrasse was brought from Greece to adorn the tables of the wealthy Romans. One of the freedmen of the Emperor Claudius, Elipertius Optatus, who commanded a Roman fleet in the Ionian Sea, brought a large quantity of these fish to the coast of Italy, where they were put into the water near Ostia, at the mouth of the Tiber. For five years all fishermen who caught such fish in their nets were ordered to throw them into the sea again; and the consequence was, that that portion of the sea, and even the Tiber itself, as far as the gates of Rome, swarmed with them. This attempt to transplant fish proved so entirely successful, that these transplanted

scari soon gained the reputation of excelling in richness of flavor those of the Greek seas. In the time of Pliny, the scarus was, without doubt, considered one of the greatest dainties. Originally, the sturgeon held this place, then the basse (*lupus*) and asellus, and at last the scarus "came, saw, and conquered."

Ovid, in his book "Παλιετικου," relates a remarkable trait in the nature of this fish: when it has been caught in a net it does not swim any further, as this would cause it to become fastened with its gills in the meshes, but it swims backward, wagging its tail. As soon as another scarus outside the net notices this movement, it comes to its assistance, by seizing the tail of the captive, and thus draws it out of the net. The relation of this remarkable phenomenon shows the accuracy of the observations of the ancients. Pliny tells us that the mullet and the scarus when they find themselves pursued, act like partridges and little children, hiding their heads at the bottom of the sea, and imagining that the pursuer cannot see them, because they cannot see him.

According to Suetonius, the "shield of Minerva," the famous monster dish which Vitellius brought into fashion, was garnished with scari. The part of this fish most esteemed was the liver.

THE MURÆNA.

The muræna is described in the following manner by Pan. Jovius, whose words are given in a literal translation to show at the same time how natural history was written in the sixteenth century: "Murænas are found in great numbers in all parts of the sea, but those from the coasts of Sicily are the largest and best. These are the kind which Columella calls 'flutes.' They swim near the surface, and it therefore sometimes happens that when the warm rays of the sun dry their skin, thereby depriving them of their flexibility, they can no longer dip beneath the water and can easily be caught with the hand. They are speckled, and are said to have star-like figures on their sides, arranged in the shape of the dipper, which, however, disappears immediately after death. They possess great cunning, for when they find themselves caught they swallow the hook, bite through the line with their teeth, and thus make their escape. I am of opinion that the ancient Romans prized the muræna more on account of its long life than of its delicious flavor; for the large numbers required for daily use could easily be kept in ponds prepared for this purpose, while most other fish soon died, either through grief at having lost their liberty or through the neglect of the pond-keepers. We know from Pliny that C. Hirrius, at a banquet given to Cæsar as Dictator, could place on the tables 6,000 murænas from his own ponds. Murænas could easily be tamed, and taught to take their food out of a person's hand. Cræsus, surnamed the wealthy, was so much attached to a muræna which he had raised himself, that when it died he shed tears, and had it buried. We also read an account of an answer, which

Cræsus gave to L. Domitius, who laughingly expressed his astonishment that any one could weep over a dead muræna; it might, perhaps, be thought strange, he said, that he, Cræsus, shed tears over a dead muræna, but it was far more strange that he, Domitius, did not shed any tears over his three dead wives. (Domitius had three wives, whom he is reported to have poisoned in order to obtain their property.)

Certain ladies showed great affection for murænas; thus Antonia, the daughter of Drusus, adorned a tame muræna with gold rings and bracelets.

Murænas eat human flesh, and the cruelty of Vedius Pollio in this respect seems well established. He placed those of his slaves who had been condemned to death in his fish-pond, in such a manner that they could not be eaten at once, but were gradually torn to pieces by the teeth of the murænas. It is said that the muræna breathes through its tail, and therefore dies sooner when struck on the tail than when struck on the head.

D. Ambrosius and several other ancient writers assert that snakes mate with murænas, and that the latter entice the snakes to the seaside by a certain peculiar whistling sound. Athenæus does not believe this, and in corroboration of his opinion quotes from a work on popular superstitions, written by Andreas. Murænas spawn all the year round, and of this kind, the *Murus*, the largest and strongest is of a uniform color, very much resembling that of the larch; so at least, Aristotle affirms: Pliny calls this kind *Myrinus*. There is also a river Muræna, which is much smaller and has only one point; and which according to Dorianus is the same that Athenæus calls *gallaria*, and I think that Athenæus must have meant by this smaller kind what we call lamprey and not the sea-fish. Iresius assures us that the flesh of the muræna is not less nourishing than that of the eel, but on account of a certain hardness and moisture it is very indigestible. It is, however, much prized on account of its delicious entrails, with which, as Lampridius tells us in his history, Heliogabalus, while far from any sea, regaled his court and the whole rural population.

THE COD FAMILY.

Of the cod family, our northern codfish was certainly not known to the ancients. The kind best known and most highly prized was the *Asellus*, which, in all probability, is our *Gadus merluccius*. At all events, Jovius tells us that the fish which the Ligurians call *asellus* was named by the Romans *squamus*, or *merluza*. Pliny informs us how highly this fish was prized. There were two kinds. The larger one is named, by Jovius, *banchus*, and reaches a length of two feet. The smaller kind he calls *callarius*. Pliny says that they have a small stone in their head, and praises their delicate flavor. Galenus maintains that its flavor strongly resembles that of the codfish. Aristotle relates that during the great heat of summer they hide themselves, and he is unable to tell how often

they spawn. The *asellus* was also called *Bacchus* on account of the wine color of its mouth, and this circumstance caused Ovid to exclaim "that a fish with so many excellent qualities did not deserve so ugly a name as *asellus* (*i. e.*, little ass.)"

As an article of commerce the *asellus* was, for the most part, salted, and in that shape sent all over the Roman empire.

The Romans did not confine themselves to these common fisheries, but also ventured to attack the more dangerous animals of the sea; and even *whales*, which came into the Mediterranean, often became a prey to the fisherman.

According to Oppianus, this fishery, although only of casual occurrence, resembled very much our mode of catching whales before our fishermen began to use explosive projectiles. There were attached to the line, which the whale would drag under water while escaping, two large leather bags filled with air, precisely like those which the Greenlanders and the inhabitants of Kamschatka use. The description of Oppianus is remarkable, as it contains many interesting details, and seems to be entirely trustworthy. He says: "The moment the monster is attacked, it dives down to the depths of the sea, and the fishermen anxiously wait for its return. Their light boats plow the foaming waves, and rapidly fly toward the battle-ground, where a combat is soon to take place, on whose fortunate termination the keenest interest is centered. The fishermen encourage each other by shouts, every one strains his powers to the utmost, and the sea presents a scene of animated confusion. As soon as the whale shows himself again, it is attacked with double-hooked spears. Its blood begins to flow, and colors the sea for a great distance; but like a staunch vessel, braving the thunder and the lightning, the whale resists the furious attacks, sometimes with a single movement of its tail sweeping away the boats which surround it, and mocking all the exertions of its assailants. But the decisive moment approaches; though mortally wounded, its tail still throws a deluge of water over its enemies. But nothing can now restrain the zeal of the pursuers. The monster is overcome, and silent and motionless it floats on the water like a conquered man-of-war after a sanguinary battle. The victors then drag their prize ashore amid tumultuous shouts of joy."

THE SWORD-FISH.

The ancient Romans possessed many sword-fisheries throughout the whole extent of the Mediterranean, from Byzantium to Gibraltar, but they were of the greatest importance on the coasts of the Tyrrhenian sea and in the great and shallow bay which forms the southern boundary of France. The name of the promontory Xiphonion (called so after the Latin name of this fish, *i. e.*, *xiphias*) shows how valuable the sword-fish was to the inhabitants of those coasts.

De la Morinière says: "One of the most common modes of fishing was

to employ, as the Greeks do, boats built in the shape of a sword-fish, with a long projecting point representing the sword of the fish's upper jaw, and painted with a dark color like that peculiar to this fish. The sword-fish, imagining he sees a comrade, confidently approaches these boats, when the fishermen, profiting by the mistake, plunge their spears into its side. The animal, although surprised, nevertheless vigorously defends itself, and by plunging its sword into the sides of the treacherous boat often exposes it to imminent danger. This moment is seized by the fishermen to cleave its head, and if possible to chop off its upper jaw. After thus overcoming its resistance, they tie their victim to the boat, and so drag it ashore.

Oppianus has preserved an amusing characteristic of this fish, which seems to contradict the statement made concerning its courage. He says that if accidentally, or in the too eager pursuit of mackerel or tunnies, it finds itself in a stationary net, it retreats, suspecting some snare, although it could easily tear the net. This timidity, however, proves disastrous, for, at last remaining quite still, the fishermen come, drag it ashore in their nets, and kill it.

SALTING.

This branch of industry was carried on in the earliest times by the Phenicians on the western coast of Spain, and was afterward continued by the Greeks; but it was reserved for the Roman empire to raise it to the highest degree of perfection. It was applied to many different kinds of fish. By the term "salt-fish," we must not understand exclusively fish laid in brine, but also those that were pickled with spices and odoriferous herbs. According to Noël de la Morinière's learned researches, fish were preserved both in a raw and in a cooked state, and in the latter case they were prepared with precious herbs only. He adds, that it would really seem difficult to suppose that the Roman Sybarites, who had the most costly fowl and fish brought from Persia, Colchis, and India, at such great cost, could find in salted tunnies, and mormyri anything to gratify their spoiled palates.

The art of preserving fish in different ways made rapid progress. Care was taken not only to preserve such kinds as would retain a delicate flavor, but, also, to bring new articles into the market, that thus a brisk intercourse might be kept up between the cities of Italy and the colonies on the coasts of the Mediterranean. In those days the mullet was frequently salted, at which people in these times, at least with us, would sneer; and its roe formed a favorite dish with all classes. From a passage in Athenæus, where he quotes Archestratus, we learn that the sword-fish was then salted in exactly the same manner as is now done on the coast of Sicily. "When you come to Byzantium," he says, "take a piece of salt sword-fish, and choose a slice of the back nearest to the tail." Large fish were cut into pieces and underwent different

processes, both simple and complicated, according to which they were differently named.

It would detain us too long to give a complete list of those fish which, when salted, were held in great esteem. The following are some for which there was the greatest demand: the sea-eel, from Sinope; the tunny, from Byzantium; the mackerel, from Spain; the tunny, from Cadiz; the sword-fish, from Sicily; the mullet, from Exone; the scarus, from Ephesus; the "*pagrus*," from Italy; the eel, from Strymon; the mormyrus, from the Nile, &c. The names of all these fish of acknowledged excellence served as recommendations for those cities or countries which had gained fame by their manner of preparing them.

But most of these fish have lost in our days the reputation which they formerly enjoyed. The mormyrus of the Nile, *e. g.*, which Athenæus described, and with which the learned Geoffroy St. Hilaire has made us acquainted, is now scarcely known beyond the works of natural historians. The same holds good of the tunny, which is now preserved in oil, instead of being salted or dried as was the custom among the ancients. The Romans had learned from the Greeks a mode of preserving it, which, with some modifications, is used even in our time among the Italians and Spaniards; it is called "escabeche." The fish are first fried in oil with bay leaves, salt, and spices, and then boiling vinegar is poured over them. This method was especially employed with several kinds of mackerel, but likewise with other fish, such as the "*pagrus*," the dorado, and even the larger kinds of perch.

The inhabitants of the Greek Archipelago were the first to preserve the tunny. This fish was salted on the islands of Eubœa, Samos, and on the coast of Icaria, which acquired the surname, "the coast rich in fish." The ancient names, *Cetaria domitiana*, (near Orbitello and Santo Stephano,) and *Terra cetaria*, (stretching from Segarte to the promontory now called Santo Vito,) designate places where the Romans had large stationary nets, and they show the importance of these fisheries.

Tarentum, in the Tyrrhenian Sea, had gained a great reputation for its salt fish, especially for its delicious tunny, which was exported to remote districts. No less famous was the tunny from Sicily, especially that kind salted in Cephalo.

The ancient *Cetobriga*, a Phœnician colony on the southern coast of Lusitania, near the mouth of the Guadiana, maintained its former great importance under the Romans on account of its stationary nets, and the immense quantities of tunnies which were salted on that coast. Resendius, (*Antiquitates Lusitaniæ*, 210,) assures us that even in his time, the ruins of the salting establishments of *Cetobriga* could be seen. The new town, *Neocetobriga*, which rose not far from the old one, and which the Portuguese have called *Setubal*, (Saint Ybes,) continued to carry on the trade in salt tunny, which had once enriched the Greek town. Castro, the historian, fully corroborates the statements of Resendius. He says the name of the town is derived from "*briga*," which in the old

Lusitanian language means "castle" or "fortified town," and from "cete," *i. e.*, "great fish" (tunny).

Malaga also owes its wealth and its name to the tunny fisheries, for, in the Punic language, "Malach" means both "to salt," and the "salting place." Several other Spanish towns contended for the fame of bringing the best articles into market. Gades (Cadiz) gained the prize. The favorite parts for salting were the gristly portions of the head; but many portions of the body were also used for this purpose. According to Galenus this fish was preferred in the salted state, because it then seemed less hard and easier to be digested.

One of the most important fisheries in those times was a tunny-fishery, which, during the Grecian period, brought great wealth to the Carian and the Milesian colonies on the Black Sea. When these fish in their periodical migrations came out of the sea of Azof, (*Palus Mæotis*,) they followed the coast of Asia, and many were caught in nets near Trapezon. Thence they went in company with other kinds of mackerel to Sinope, whose inhabitants, according to Strabo, grew immensely wealthy through this fishery. Amastris, Tejum, and Heraclea, located on the same coast, likewise reaped a rich harvest. If we may believe the author of "Storia filosofica e politica delle colonie degli antichi nel mar Negro," the best harbors were Sinope and Galidon, on the river Halys, near whose mouth great salting establishments were located.

Notwithstanding the enormous quantities of tunny caught on the coast of Thrace, the salt-fish from Sardinia were the most famous, and those of the best quality were called sardinians.

The fish known in France by the name of "*auriol*," (in Spanish "*cavalla*,") is another kind of mackerel, great numbers of which were salted by the Greeks. Athenæus praises it in the most eloquent manner, and its fame increased still more after the Romans had conquered Spain, and had learned how to extract from its entrails the far-famed "*garum sociorum*," a fish sauce which was greatly prized. Although several ancient authors have written the most glowing encomiums on this secret preparation, (for it seems to have enjoyed then as great a reputation as the English fish-sauce in our times,) it is impossible to discover what this '*garum sociorum*' really was. Pliny, the encyclopedist of the ancients, says that this fluid matter was an extract from the entrails of certain fish that had undergone the process of fermentation. "The Greeks," he says, "in former times, prepared '*garum*' from the fish called by that name; the best '*garum*' comes now from Carthage, in Spain, (*Carthagena*,) and is called '*garum sociorum*.' You can scarcely buy two boxes (each containing about ten pounds) for a thousand pieces of money. No fluid, except scented waters, sells for so high a price, and it is in great demand by all classes of society. The fishermen of Mauritania, Betica, and Carteja, prepare it from mackerel, fresh

from the ocean, which alone are fit for this purpose. The 'garum' from Klazomene, Pompeii, and Liptes is also highly praised; and the prepared fish from Antipoles, Thurium, and Dalmatia are no less to be recommended." (Pliny, Hist. Nat., XXXI, 8.) Paul Jovius tells us that the best "garum" was obtained in Africa. This "garum sociorum" was chiefly prepared by a certain society of mackerel fishermen, (hence the term "sociorum,") which in those times seems to have played a part similar to that of the "Maatjes Haringen," herring-society, in the Netherlands.

Besides this prime article of "garum," other kinds formed an extensive item of trade among the Romans. Athenæus tells us, among other things, of one kind prepared from the entrails of the "*lykostome*," a fish which is closely related to the anchovy, and which is probably the same as that still to be obtained at Antibes, although Martial only speaks of "garum" prepared from tunnies. (Mart. Epigr. XII, 103.) A similar preparation, called "Incia," was frequently used in the time of Helio-gabalus, for preserving fish.

The epicure, Apicius, offered a great prize to any one who would invent a new sauce or paste of the livers of mullets. But the name of the man who secured the prize has been lost to posterity; for, as Pliny remarks, "it is easier said than done."

We will only mention, in conclusion, that the Greeks preserved the sea-eel in salt and marjoram. They were the greatest masters in pickling the dorado and in preserving the scarus in brine. But the Romans far excelled them in the use of costly spices, and in pickled and preserved fish, which still further increased the enormous prices paid for the rarest fish brought at large expense from foreign countries.

LOBSTERS.

Of lobsters, Paul Jovius speaks thus in the fortieth chapter of his book: "Among the shell-fish, the lobster enjoys the greatest reputation. Theodorus thinks this is the animal which Aristotle calls the crab. But Oppianus understands by the term 'crab,' what is commonly known as the 'lion,' and Theodorus calls this kind '*Commarus*.' For in the passage where he describes so vividly the combat between the *muræna* and the crab, he gives to the latter an indented pincer-like claw, with which it bites the neck of the lamprey." It is certain, however, that both the lobster and the crab were known to the ancients, besides some other kinds, such as the craw-fish, and those which Oppianus and the rest of the Greeks called "*Karidæ*." Paul Jovius does not show any great knowledge of natural history, when he says that the lobster is red, and yet certainly, quite as much as the French Academy of Sciences in the good city of Paris more than three hundred years later, since, not very many years ago, one could read in the great dictionary of that academy under the word "*écrevisse*" the following remarkable definition: "animal rouge qui marche en reculant," *i. e.*, "a red animal which walks back-

wards!" "The flesh of this animal was generally found to be very hard, but its eggs were eaten prepared in different ways and were considered a great delicacy. They were also put to various medicinal uses; thus they were recommended for hectic and feverish persons; and Galenus's teacher, Ærkhirion, advises those who have been bitten by a mad dog, to roast alive one of that kind of crawfish, which in Greek is called "*Karkinos*," and to turn towards the constellation Canis, when the sun passes through the sign of Leo," &c.

FISH, OYSTER, AND SNAIL PONDS.

As to these ponds, we give the information found in Pliny, Paul Jovius, and the Frenchman Coste in his extremely interesting work, *Voyage d'exploration sur le littoral de la France et de l'Italie*, &c., in that portion of the book where he speaks of the raising of oysters in Lake Fusaro, p. 97.

From the passage quoted from Pliny, we see that the Romans had fish-ponds for various kind of fish, but that the *muræna*, on account of its peculiar tenacity of life, was best suited for being thus kept. Several such ponds are mentioned as belonging to noted persons. Spawning-ponds, however, such as are now found in great numbers on the coast of France, where the fish are raised and fattened till they are fit to be sent away, seem to have been unknown. It would appear that persons were satisfied with putting those fish in ponds that were caught in the sea, to have them on hand, as it were, to fill an order at any time; although many circumstances seem to favor the opinion that, at least as far as the *murænas* were concerned, many of these fish were bred and raised in these very ponds. Though there are not sufficient grounds to prove that the Romans had a regular system of breeding and raising fish, we know enough to conclude that the raising of oysters had reached such a degree of perfection as to command our highest admiration.

Pliny tells us that the first inventor of oyster-ponds was a certain Sergius Orata, who in the time of L. Crassus lived near Bajæ. What led him to this invention was not gluttony, but a spirit of speculation. He had made a good deal of money by his bathing establishment, and by redecorating old country-houses so as to make them look like new ones, when he conceived the project of speculating in oysters. At that time the existence of oysters on the English coasts was not known, and Brundisium, which had almost the exclusive privilege of supplying the whole of Italy with the article, was so far from Rome, quite in the southeastern part of the peninsula, that the oysters reached the capital in a very poor condition, often completely spoiled. It is well known that oysters and fish are of a better quality in some localities than in others. Thus the best lupus or basse* is found in the river Tiber between the two bridges; the best turbot in Ravenna; the best *murænas* in Sicily, &c. Orata found in Lake Lucrinus a place specially favorable for his undertaking. This

* Lupus of the ancients, or *Labrax lupus* of naturalists.

lake, which had a clear bottom and pure water, was connected both with the salt water of the ocean and with fresh river-water, and in the hands of Orata it soon became a gigantic oyster-pond, which could at all times supply Rome with oysters of such an excellent flavor as soon to gain the very highest reputation among all the dainty eaters in Italy; for they ordered these oysters to be sent to them in wooden boxes filled with water, even to places at a great distance from the sea. Athenæus tells us that a noble sycophant, by the name of Apicius, sent fresh oysters carefully packed in jars to the Emperor Trajan, while he was waging war against the Parthians in the interior of Asia.

The fullest information on this subject we gain from two ancient monuments of the time of Nero, of which a short description is given in the above-mentioned work by M. Coste. These remains consist of two sepulchral-urns of glass, one of which was discovered near Popolaria, the other near Rome. They resemble in shape our refrigerators of terracotta, viz, a round vessel with a long, narrow neck. The outside of these urns is covered with a sort of engraving, which, notwithstanding its rudeness, shows us very distinctly an ancient oyster-pond. To convince us still further, we find on one of them the following inscriptions over the engraving: "Anima felix vivas," and "Stagnum Pallatium," (the first containing a wish that the soul may live happy, the second being the name of a country-seat which the Emperor Nero possessed on Lake Lucrinus;) and immediately in the center of the engraving we read the word "ostriaria," i. e., oyster-pond. On the other urn we read the following inscription, "Stagnum Neronis Ostriaria; Stagnum Silva Bajæ," which leads the thought to Bajæ's famous coast, where also Nero had a villa. The most remarkable thing about these engravings is that a great number of poles are seen rammed in the ground—placed in circles—for this can only have been done with the same object for which this is done in our days near Lake Fusaro, viz, to give to the young oyster an object to which it may cling.

It is evident from this that the ancients not only kept a stock of oysters in their ponds, but also let them breed there, and in various ingenious ways made their extraordinary fruitfulness a source of income. We have here authoritative proof of a regularly organized system of oyster-culture, which brought untold wealth to its inventor, Sergius Orata, this "magister luxuriorum," as Cicero calls him. His example was followed, and soon many other oyster-ponds were established. Licinius Murena was the first who had ponds for fish, especially for the muræna, which he named after himself, and soon most of the rich and noble Roman families possessed their own fish-ponds, such as Philippus, Hortensius, and Lucullus. The last mentioned, as Pliny tells us, had a channel dug through a mountain, near Naples, at a greater expense than it would have cost to build a magnificent country seat, and in this manner brought the sea-water into his gardens. Pompey, from this circumstance, called him a "Xerxes in the toga."

Shortly before the outbreak of the civil war with Pompey, Fulvius

Hirpinus was the first in the Tarquinian district to establish snail-ponds. He arranged them in separate divisions: one for the white snails from Reatine, one for the Illyrian snails distinguished by their great size, one for the African snails, which are very fruitful, and another for the Solitanian snails, which are the finest of all. He even invented a special kind of food for them, prepared of thick must, flour, and other ingredients, and by means of this artificial diet they grew to an enormous size.

Galenus says that, as a general thing, oysters, especially if eaten raw, produce witty thoughts. Pliny attributes to them a purging property, and advises people to use the burnt shells as a remedy for dysentery.

In addition to the above, a large number of mussels and garden-snails were eaten, such as the blue mussel, "purpuræ," "buccina," "aures," "digit," "ungues," "patellæ;" and Horace says, "effeminate Tarentum boasts of her large scallops." The ancients knew how to prepare even sea-urchins and star-fish as dainty dishes.

The above may serve to give some idea of the state of the fisheries among the ancient Greeks and Romans, as well as the different branches of trade and industry connected therewith; and we certainly feel constrained to admit that they had attained to an astonishing degree of perfection. The fall of the empire also brought about the decline of the fisheries. Rude hordes of barbarians overran the empire in overwhelming numbers, and destroyed a refined, and, in many cases, effeminate, but at the same time beautiful, product of the oldest civilization.

I close these remarks with the following words of the excellent Noël de la Moirinière: "The conquest of so many countries which were forced to accept laws made for them by the barbarians, sundered all commercial ties, after having destroyed the industry and art which gave them life. We therefore see the most important fishery of the Mediterranean, the tunny-fishery, after being entirely destroyed, revived again after long ages.

"In the history of the later emperors, we hear no longer of those costly fish which the luxury of the wealthy procure from distant countries, and which gave luster and the greatest enjoyment to their banquets. The fish-ponds which once swallowed princely fortunes, stand empty and deserted. The time of extravagance has passed, and strange and morbid fancies have lost their sway. People can procure only with great trouble the most common fish, in order to fulfill the ritual of their religion. Fishing is carried on only by the poor inhabitants of the coasts, whose abject poverty is their best protection against the plundering invaders, or who only manage to carry on their miserable trade, undisturbed, by retiring to lonely nooks, such as the lagoons near Venice, or the swamps of Narbonne, thus interposing large and almost impenetrable morasses between themselves and their avaricious pursuers."

Public interest is now directed toward the North, and here we also find fisheries springing up anew, which soon grew to an astonishing extent and won for themselves a new and grand commerce; so that Sergius Orata would still not be entirely out of place among us.