THE ECONOMIC SEA FISHES OF OUR COAST.

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(Paper read at the 3rd Annual Scientific Meeting held in Nov., 1933.)

I rather apologise for daring to give a lecture on our Economic Sea Fishes, for an old friend once told me that those who know nothing about their subject either lecture or write books; whilst those who do, keep their mouths shut—so you know the class I belong to. However, it is no use bemoaning one's fate so we will get on with the job beginning with a few remarks on the life of our seas, upon which is based the existence of our economic fishes.

Along the coast of this great continent the water is comparatively shallow and a shelf is formed, either by wave erosion, a falling or even an uplift of the shore itself, or by the seaward extension of deposits of mud and silt brought down by the large rivers. This is known as the Continental Shelf. The water over the Continental Shelf varies from nothing to 100 fathoms and also varies considerably in width. For instance, from Mombasa to Lamu the Continental Shelf is a very narrow strip, but south of Mombasa it stretches over to Zanzibar and Pemba with only a narrow deep valley between.

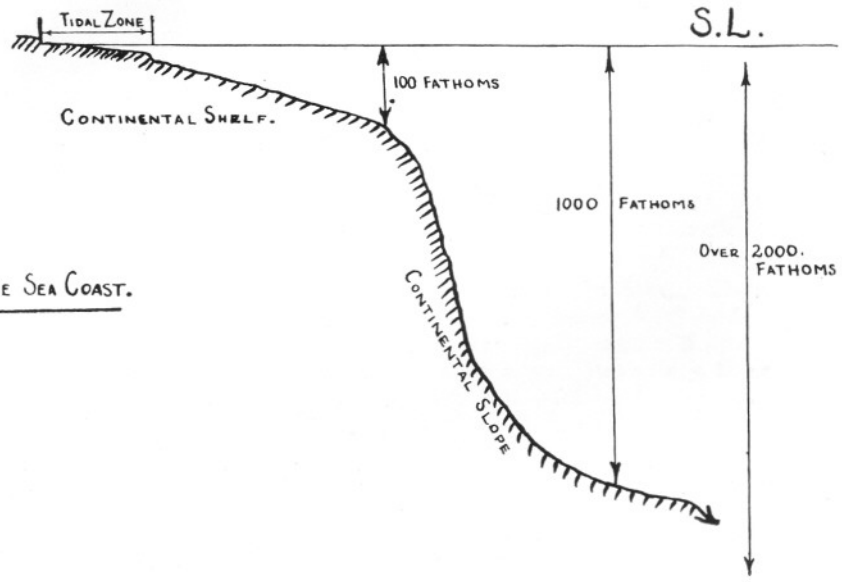
From the seaward edge of this shelf starts the Continental Slope which is generally considered as running from the 100 fathom mark to the 1,000 fathom line.

After the 1,000 fathom mark is reached, the bottom of the sea stretches away not unilke a vast and slightly undulating plain and these are known as the Abyss or the Abyssmal Plains.

There are regions below this 2,000 fathom mark and these go from 2,000 fathoms to 5,000 fathoms, being known as " deeps." There are five such deeps in the Indian Ocean and the greatest depth yet sounded is 5,350 fathoms off the Island of Mindanao, Phillipine Islands. Taken as a whole the depth of the ocean is very great, for more than half the ocean floor lies between 2,000 and 3,000 fathoms, whilst well over three-quarters are over the 1,000 fathom mark.

Now the basis of all life in the sea is plankton. Again this word " plankton " covers a multitude, so we will go to the basic plankton which is the diatom. These are little plants which have two glass-like protective shells, lid-like structures that fit, one into the other, and thus enclose the body in a little box.

There are other single-celled organisms which help to swell the great drifting multitude of the sea. They are divided into three great groups:



The Sea Coast.

— the Diatoms, the Peridinians and the Coccospheres. Now these form the food basis of yet larger plankton, the Copepods, of which the most important is Calanus. This is very often called " brit " or whale food. Again there is a larger shrimp-like animal called " krill " by the Norwegian fishermen which has a length of about 1½ inches. These two are the main food of hosts of fishes and two kinds of whales.

You, therefore, have in our seas drifting forms of plankton, feeding upon which are large transparent shrimp-like animals and upon these feed the sardines, anchovies and a host of small fishes. Again feeding upon these are the economic fishes which supply our market. So that the basis of all are the unicellular forms of drifting life. If they fail, the fisheries fail and *vice versa*, whilst again this minute life depends on water temperature, generally within a close limit, and also salinity but this subject must be left to another paper.

However interesting these vital questions are we must get on to the fish themselves.

The economic fish fall into three main divisions:—

The Pelagic fish or the surface fish, in which section the big game fish belong.

The Coral Reef fish in water from 3 to 10 fathoms.

The bottom feeding fish in water from 10 to 30 fathoms.

Each fish appearing in the market belongs to one of these three classes.

The next point to remember are the monsoons and that each monsoon brings different fish, but there are a certain number of bottom feeding fish and one pelagic fish which stay on the coast all the year round. These have migrations from the deep water to the shallow water for spawning.

THE PELAGIC FISH.

The fish of the north-east monsoon are as follows:— 5 different kinds of herrings, 3 anchovies, a glass-nose and a smelt. The flying-fish also come with the monsoon and are actively chased by every sporting fish that swims. Feeding on these come the Sailfish or *Suli suli*, the dolphin or *faloosi*, the Five-fingered Jack or *pandu*, Commerson's King-fish or *nguru*, 4 members of the Caranx family the *koli koli*, *kambesi*, *wai*, *matongo* and the *pamamba*. Then the various lesser tunnies such as the bonito, the oceanic bonito, the albacore and the yellow-finned tunny which go under two common names, *jodan* and *sahaywa*.

With the south-west monsoon more southerly species of fish come up the coast and they are all of a much smaller size. There is a smaller king-fish, three different kinds of Caranx of which the largest and the

principal one is the *kotwe*, and a number of bottom feeding fish, principally of the Dentex family.

With the exception of the sailfish, which goes up to a thousand pounds in weight, all these fish come to the Nairobi and the Mombasa markets. They are excellent eating, the flesh being firm and white. In size they vary from 5 to 100 pounds. The principal native method of catching them is to bait a hook on a handline with a bunch of *seemu* or sardines and tow at a speed of from 4 to 5 knots from a small sailing dhow. Should they go through a big school of *pandu* or *nguru*, which sometimes are acres in extent, the fishing is fast and furious.

When after the *faloosi* or dolphin and a small school of these fish are met then three or four lines are baited for action. As soon as a dolphin is hooked the line is made fast so as to have the hooked fish still astern and the other lines are put over. The shoal always keeping with the captive, as many as seven fish will be taken from one school by this method.

THE CORAL FISH.

The coral reef fishes seldom come to Nairobi. Some are poisonous whilst nearly all are of brilliant hues. From the market food point of view they are useless but a lot are caught for local consumption, fishing being made from small out-rigger dug-outs using squid, cuttle-fish, cut-bait, prawns, etc. for bait.

THE BOTTOM FEEDING FISH.

These are of equal importance to the Pelagic fish, even more so, and are caught by line fishing off the 20-fathom mark. The bait, generally sardine, squid or cuttle-fish, is lowered to the bottom by means of a stone sinker to counteract the force of the tide. The fish caught are generally lumped together under the general name of " snapper," especially by the chief steward on the boat. One day it is " red," the next " grey " and even " rock salmon," and one enterprising Union Castle gentleman labelled it " sea trout," which was certainly one up on myself.

There are five main families, i.e., Lethrinus, Lutianus, Pagrus, Serranidæ, and Dentex, and they all belong to what I might loosely describe as the bream and perch family.

There are about 20 different Lethrinus, the same number of Lutianus, about a dozen Pagrus, twenty Dentex and perhaps a hundred different Serranidæ, so it will be best to describe a few of the commonest of each family. All, however are good table fish whether boiled or fried.

The commonest of the Lethrinus family is the Scavenger of which there are two kinds, the common Scavenger (*Lethrinus nebulosus*), and the Long-snouted Scavenger (*Lethrinus miniatus*) called *kibura* by the fisherman.

The general colour of each fish is olive-brownish, difficult to describe; the head is dark with violet colouring on top; each scale on the back and sides has a cobalt-blue centre, whilst there are a number of cobalt-blue lines and splashes on the cheeks. The edges of the dorsal, anal and caudal fins are yellowish or reddish. One very interesting fact is that all this family have the whole of the mouth and throat coloured orange or scarlet and a vivid colouration it is too. When driving off any intruders the fish opens its mouth and charges its foe showing these vivid colours. The foe generally retires in haste.

The Long-snouted Scavenger has a long head and snout and also narrow vertical dark bands on the sides. Both fish go up to 20 pounds in weight, but the average would run from 5 to 7 pounds.

The two most common species of the Lutianus family are the Two-spot Snapper (*Lutianus bohar*), called *casanda* by the native fishermen, and *Lutianus gibbus* or *kuenga*. The Two-spot Snapper is a reddish-brown in colour, with two silvery-white spots on the back above the lateral line, one below the end of the spinous dorsal and the other below the end of the soft dorsal. *Lutianus gibbus* is a rich crimson with the soft dorsal, anal, and caudal fins with a vivid white or yellow margin; the other fins are yellowish but the ventral has a dark tip. These fish go up to 12 pounds in weight but the average would be from 2 to 4 pounds. A good common name for the last fish would be the crimson snapper.

For the Serranidæ or the Rock Cods I will pick out the Tewa (*Phomicrops gigas*). This is the largest of the family, some specimens running to the 400 pound mark. To look at, they are like a big perch, a chocolate blotched dark looking fish with a spinous dorsal fin and a mouth which you can put your foot down. They frequent deep holes and passages in the reef, steamer anchorages, deep water jetties, and are caught on handlines. Should one be hooked the ensuing encounter is a real tug-of-war as the only idea in the mind of the fish is to get back into some deep cavern and stay " put."

For the Pagrus family I take the Mud Bream (*Pagrus berda*) or *Chena* of the Swahili as an example. The colour is silvery grey, scales with a dark edge, fins sometimes barred.

This then is a very brief description of the economic fishes which affect the housewife but there is a good trade done catching shark up and down the coast. At Lamu, shark, rays, and sawfish are caught in special nets and although it is a small trade you will find that further up the coast, at Kismayu for instance, a lot is done. The flesh is dried, also eaten fresh; the fins are rough dried and shipped, principally to Zanzibar and then on to China.

The common economic fishes are rough dried in the sun, an attempt is made at salting and the result is a most unsavoury article.

The catches are auctioned by bulk in the local market, this business being in the hands of a small ring. The purchasers then retail them in smaller lots but no precaution is ever taken to prevent damage or exposure. The Nairobi market is supplied from the Mombasa market, the fish being packed in old sawdust with a most inadequate supply of ice, the whole trade being a disgrace to the Colony or any collection of European people. There seems to be no control or supervision over the industry to see that proper hygienic conditions are complied with. However, this is a very sore subject so I will leave it alone, but the whole matter of our sea-fishing industry including the intrusion of the Japanese element is now up before Government.

There are several local minor industries of which one has been mentioned—the curing of shark fins. Again this industry is done so badly that the prices got are very poor. It may interest you to know that the skin is used by the coast carpenters in place of sandpaper and a varnish is made from the entrails which is applied to the dhows.

The next minor industry is " trepang " or " bêche de mer " made from one of the Holothurians called *jongoo* on the coast. The licence to collect these sea-slugs is generally bought at yearly auctions. The slug is a fat leathery sausage-like bag as long as 8 inches and 2½ inches in diameter. They are boiled in two or three changes of water and are then sun-dried on wicker-work tables. This reduces them to half their original size, the remains being both hard and brittle. They are shipped to China through Chinese merchants but do not fetch anything like a good price as the method is too crude, and there is no sorting of the best quality from the poorer varieties.

There is also a trade done in various shells and a species of murex and a large cowrie are exported for cameo work. Other shells find their way into the interior for personal decoration.

There are great banks of edible oysters all along the coast and this industry alone is worthy of proper investigation and development. Small pearls are sometimes found.

There is a trade in prawns which are handled with the fresh fish but all the dried prawns to be bought along Government Road are from Madras although they live in millions along our own coast.

The bone of the cuttle-fish is used in the local jewellery trade for working and polishing precious stones.

Time does not allow me to treat with measures that might be instituted to develop an economic fishing industry, also I have kept the paper short, deliberately, so that there will be a little time in which to answer any questions but I do not guarantee to answer them all as my knowledge is very scanty. However, I will do my best.