

## 26.—FISH AND FISHING IN BRITISH GUIANA.

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The importance of the subject of fish and fishing in Guiana is one that can hardly be overestimated, and though the sea and rivers, and even the swamps, are stocked with palatable and delicious fish, yet thousands and thousands of salt fish are annually imported, and form, with plantains and such like fruit and vegetables, the staple diet of the poorer classes along the coast. There is no sufficient permanent supply of fresh fish in the local market, the people engaged in the fishing industry being either too few in number, or by no means constant in their catering to the wants of the community, though there is always a certain steady demand for their commodity.

The common food-fishes found in the markets include such forms as the snook (*Centropomus*), the gilbacker (*Platystoma*), the querriman and mullet (*Mugil*), the cuffum (*Megalops*), the bashaw (*Sciæna*), the jewfish (*Plectropoma*), the pacumah (*Batrachus*), and the flounder (*Platessa*), which are caught in the shallow water off the coast, or in the sheltered bays and mud-flats, and in the estuaries of the river even at some considerable distance from the sea. At certain times, especially during the long dry seasons, three species of fresh-water fishes are extraordinarily abundant. These are the "hassar" (*Callichthys*), and the "hoori" and "yarrow" (*Erythrinus*), which, on the drying up of the smaller creeks, are found in enormous quantities migrating across the savanna outlets to the larger streams, or inclosed in the small ponds, where often the hassars are densely buried in the soft mud. At such times groups of the village people will be found collecting along the creek beds, and bringing to the towns and villages barrels and boat loads of these fishes which have either been densely packed alive or have simply been thrown into some small vessels with but small quantities of water and a little grass for their protection from the sun.

Further inland these three species are equally abundant, but other much finer and larger fishes are obtainable and are largely used. Among such may be mentioned the haimura (*Macrodon*), the sunfish and lucanani (*Geophagus*), the pacu and morocot (*Myletes*), the perai (*Serrasalmo*), the cartaback (*Tetragonopterus*), biarra (*Hydrolycus*), the paruarima (*Hemiliopterus*), the daree (*Leporinus*), the tiger-fish (*Platystoma*), the lanlan (*Piratinga*), the arrowana (*Osteoglossum*), the arapaima (*Sudis*), and many others.

The daree, cartaback, and perai are small species, ranging from a foot to nearly 2 feet in length, though deep and thick in body; the haimura, tiger-fish, and paruarima are larger, reaching to from 3 to 5 feet, while the lanlan and arapaima are giants of their kind, and attain a length of from 12 to 15 feet respectively, the former being caught by long ground lines set at night, while the latter is shot by the Indians with their long harpoon arrows with separable barbs. The pacu are secured only in the higher parts of the rivers where they feed on the abundant water weeds (*Lacis*) growing on the rocks amid the rushing waters of the rapids and cataracts, at which times

they are easily secured by the deadly flight of the Indian's arrow. The others are commonly secured by long lines or traps, constantly to be found along the rivers and creeks, and so arranged as to prevent the fishes caught from being devoured by other fishes and aquatic animals, such as alligators and others. The lines are set by means of long spring rods, which, when the fishes are caught, hoist them well above the surface and out of reach except to the fishing people who visit the lines at intervals and reset them with fresh bait.

The voracious and predaceous "perai" are so abundant in certain parts that they may be continuously caught by the mere dropping of the baited hook into the water, with a total disregard of the nature of the fleshy bait. Unless the hook be well secured by a stout wire, the fish generally, however, snaps himself free by a bite from the strong and sharp teeth, which, on account of their strength and sharpness, are made use of by the native Indians for cutting purposes in hunting, the jaw of this fish being always a part of the furnishing of the quiver in which the poisoned (oorali) arrows for the blowpipe are carried. These fishes are the great pests of certain parts of many of the great rivers, wounded and defenseless animals being often the victims or sufferers from their attacks—the armed stingray, even, generally showing a shortened tail and a much damaged fin expansion, owing to the bites from these water tyrants.

The lucanani and sunfish are almost equally abundant, and in certain places and at certain times of the year they can be caught by the mere cast of a fly, though the larger and heavier ones require much careful playing to secure them. These and many other common fishes readily take a fly and afford considerable sport to the angler.

There are easy methods in use by which the native people secure all varieties of fishes in almost unlimited quantity. The smaller fishes, like the daree, are easily secured by throwing pellets of the crushed leaves of the connami plant (*Clibadium asperum*) into the water. The fishes greedily devour the pellets, and being narcotized float helpless on the surface, and are rapidly picked up by the Indians ere the effect passes off, and are either used for bait for larger fishes or directly themselves for food.

On a much larger scale enormous quantities can be obtained by poisoning the water by means of the fish poison or "haiari." The haiari plants are cut into short pieces and pounded into pulp, and then mixed with water, so that the milky poisonous juice might the more readily be dissolved out. By casting this mixture into a stream or channel of the river that has been dammed up to prevent the rapid escape of the water, all the fishes in the immediate vicinity are affected and float after a time, according to their size, either quiescent or struggling on the surface. The larger kinds are rapidly killed or stunned by blows on the head and the desirable ones quickly secured. In this way hundreds of specimens of all sorts may be secured. It is a very effective but wasteful method, since it leads to the wholesale slaughter of large and small fish, the greater part of which is never secured.

When the larger fishes, such as the lucanani, the sunfish, the pacu, the tiger-fish, the haimura, and others, are secured in very large quantities and of sufficient size, they are preserved for future use by the natives along the rivers by means of the method known as babracoting. This consists in smoking and drying the fish, as is done with other fish, on a wooden stage over the wood fire—the wooden stage being known as the "babracot." Fishes thus preserved can be kept with very little attention for long periods, and babracoted pacu and lucanini can often be obtained on the coast after a successful season in the interior. The common bassar, yarrow, and hoori are often thus cured by the negroes on the coast and kept for future use.

A species of *Myletes*, known as the "morocot," and very abundant in the rivers of the northwest district of Guiana, has recently become the subject of a small curing industry, and this might be extended, with enormous advantages, to other species. The lack of enterprise in the prosecution of such industries is certainly deplorable, though considering the ease with which the wants of the common people can be supplied under such favorable tropical conditions as exist in Guiana, it can hardly be remedied. When men, women, and children, with but a fish-hook and the commonest ground bait, can secure even from the canals and trenches in the town and the immediate neighborhood more than a sufficient supply of fish for their own requirements, the difficulty of the problem can hardly be removed.

To the ichthyologist a considerable degree of interest attaches to the subject of fish in Guiana, the more especially in that so little research has ever been prosecuted in this direction. Since the work of the Schomburgks, and the publication of the "Reisen in British Guiana," and the two volumes in the Magazine of Natural History series, no detailed attempt has been made to work up the subject, though various descriptions of fishes from Guiana have been published at different times. An interesting field for work here lies practically untouched. Hundreds of species that frequent the estuarine reaches, the canals and trenches, the sheltered and open savannah creeks, the distant forest streams, and the upper reaches of the rivers in the various parts of the country, are practically unknown, and yet await the description of the naturalist and the illustration of the artist.

Interesting as are the relations of distribution of the great groups—as, for instance, the extreme development in size and number, both as to species and individuals, of families such as the *Siluridae* and *Characinidae* as contrasted with paucity in others, as the *Cyprinidae*, special interest is attached to many individual forms, of which the electric eel (*Gymnotus electricus*), the river stingray (*Trygon hystrix*), the barker and paruarima (*Hemiliopterus ornatus*), the four-eyes (*Anableps tetrophthalmus*), and the common hassar (*Callichthys littoralis*), may be mentioned.

The electric eels are common both in the higher and lower reaches of the rivers, and especially in certain parts of the estuary of the Essequibo, where they are frequently caught in the seine of the fisherman. The river rays too are common in the higher parts of the rivers, where extensive sand and mud flats abound, the colors of which they so much resemble as to be hardly distinguishable in the shallow waters. The wounds from the poison spines of these fishes are peculiarly dreaded by the river people, owing to the difficulty in healing the intense ulceration resulting from them.

The paruarima inhabits the upper reaches of the rivers and is remarkable for the peculiarly loud grunts or barks which it makes, and which evidently are intensified by the greatly disproportionate size of the head and thoracic portion. The peculiar division across the eyes of *Anableps* is too well known to require description; so marked is this development, however, that its common name, "four-eyes," would appear to be peculiarly appropriate. These fishes are met with in astonishing numbers all along the estuarine mud flats and creek mouths, and at low water especially will be found feeding along the courses of all the little mud rills over the exposed flats, from which they rush, on disturbance, with rustling noise to the water, where they can be seen cresting the surface in all directions—a great part of the head and even the body being exposed, projecting above the water, as they propel themselves vigorously forward with the tail and hinder part of the body.

The common hassar (*Callichthys littoralis*), the commonest of the Guiana fishes, is noteworthy in many respects. The enormous size and the peculiar arrangement of its scaly armor; the hardness of its constitution, by means of which it can survive exposure for hours outside the water without damage, or exist buried in the soft mud during the dry weather, and its immense propulsive power, as shown in its migration from place to place on the savannahs during the progress of the dry weather, are full of interest. Its power of movement on the land, due to its great strength and to the peculiar size and structure of the anterior spine of its pectoral fins, by which it makes huge jumps and leaps, and generally manages to work itself back into the water if it be placed on the land, is a constant source of surprise to those who witness it for the first time. But the most curious feature in their life-history is to be found in their breeding habits. Unlike the generality of fishes, the hassars prepare a nest for their eggs, the structure being made up of leaves, straw, or grass, drawn or heaped together, in which the eggs are deposited, and the males then congregate in the vicinity of the nest, keeping guard as it were over the safety of the eggs.

Of the great coast monsters, the selachians, several species are known, though but little detailed observation has ever been made of them. Many species of the *Carcharias* and *Galeocerdo*, from 6 to 10 feet in length, frequent the shores, especially along the outsides of the wharves, where they are sometimes seen and are occasionally caught. Young specimens of these genera are frequently taken in the nets of the fishermen, and at times great damage is caused by the presence of those of larger growth. Further at sea the species of *Zygana* are obtained, small specimens being met with on the mudflats. Great eagle rays, cow-nosed rays, and devil-fishes (*Ceratoptera*, *Rhinoptera*, *Aëtobatis*, etc.) occasionally are caught entangled in the nets, though more usually they drift into the rivers, among the wharves and shipping, and get entangled at the fall of the tide. So, too, with the species of *Pristis* (*P. pectinatus* and *perotteti*) which at times are obtained about 23 feet long, with a girth of over 10 feet. These are usually stranded by the fall of the tide on the flats, or in some narrow drainage trench along which they have traveled, unable to turn back.

As will have been gathered from the foregoing, native fish products play but little part in the trade of Guiana. Isinglass, or fish-glue, is exported in small quantities, this being the dried swim-bladder of the gilbacker fish, which is perhaps more plentifully taken than any other of the common food-fishes of the coast.

The chief fresh-water fishes, as already described, form the chief portion of the animal food of the native Indians, who, when no better can be obtained, boil up any of the smaller kinds, with an abundant supply of peppers, thus making a palatable and nutritious, but extremely hot, sauce, to be taken with the baked cassava or manioc cakes, which, to them, take the place of the "staff of life."

Parts of a few species are applied to industrial purposes by the Indians, of which the jaw of the perai, already mentioned, may be taken as an example. The finely-toothed palate bones of the arapaima (*Sudis gigas*) are highly prized by them, and are used as files to rub down and smooth off the bows made of the hard woods "washiba," "tubicuse," and "letterwood." The skins of a few species, such as the tiger fish (*Platystoma tigrinum*), are made into pouches, and the fish mentioned is usually selected by the peaiman, or "medicine man." By many of the savannah Indians, scraping implements or tattooing instruments are made of the anterior serrated spine of many of the siluroid fishes, the sharp edges being protected by a small bamboo case.