

XXV.—NOTES ON PISCICULTURE IN KIANGSI.*

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Fish-culture having attracted much attention of late years in Europe and America, a few notes on the manner in which it is conducted in this part of China may be of interest.

It is well known that "the Chinese have long bestowed more attention on pisciculture than any other nation, and with them it is truly a branch of economy, tending to the increase of the supply of food and the national wealth—not merely, as it seems to have been among the Romans, an appliance of the luxury of the great.

"The art of breeding and fattening fish was well known to the luxurious Romans, and many stories are related about the fanciful flavors which were imparted to such pet fishes as were chosen for the sumptuous banquets of Lucullus, Sergius Orata, and others. The art had doubtless been borrowed from the ingenious Chinese, who are understood to have practiced the art of collecting fish-eggs, and nursing young fish, from a very early period. Fish forms to the Chinese a very important article of diet, and from the extent of the watery territory of China, and the quantities that can be cultivated, it is very cheap. The plan adopted for procuring fish-eggs in China is to skim off the impregnated ova from the surface of the great rivers at the spawning season, which are sold for the purpose of being hatched in canals, paddy-fields, &c., and all that is necessary to insure a large growth is simply to throw into the water a few yolks of eggs, by which means an incredible quantity of the young fry is saved from destruction."

Such is the description given in Chambers's Encyclopedia, of pisciculture in China, but as all details are omitted, it is proposed to supply a few from observations made in this vicinity. Fry-fishing commences here (Kiu-Kiang, on the Yangtse) about the middle of May, and lasts from ten to fifteen days. The preliminaries for this kind of fishing are not numerous. The net, which is of coarse gauze, dyed brown, is fixed on its proper frame, and the whole cast alongside the river-bank, where there is a moderate current, sufficient, however, to keep the net in position, and to sweep the fry into the trap.

A single frame as it floats upon the water represents our letter V, and measures about 15 feet long, and 8 feet across the mouth. The net

* Land and Water, XX, No. 510, October 30, 1875, pp. 338-339.

attached to it is submerged about a foot, thus serving to collect the fry as they are drifted by the current into the trap at the end of the frame. The bottom of this V-shaped frame is not closed together, a little space being left to allow the spawn to pass through the throat of the net leading into the trap, which floats perpendicularly and to prevent its collapsing; it is tied to splints run through the four corners of its frame, as will be seen from the drawing forwarded.*

As many as four or six of these V-shaped frames are attached to a long bamboo moored close to the river-bank in rows one above the other, at distances of from 15 to 20 feet apart, where they are left all night and day.

But let us look into one of these traps. The net-tender, who lives in a mat-hut on the river-bank hard by, or in the sampan (small boat) used to visit the nets, readily gratifies our curiosity.

Taking an ordinary-sized rice-bowl, he dips it into one of these cages, which it should be noted appear to require emptying every hour, and hands us about a quart of muddy river-water, perfectly alive with wriggling, transparent looking fry, measuring from an eighth to two-eighths of an inch in length, with heads and eyes greatly out of proportion to the size of their bodies. Even in the muddy water there was no difficulty in discerning them, as one would be led to suppose from Abbé Hue's statement "that it is impossible to distinguish the smallest animalculæ with the naked eye." Experts are said to be able to detect the different kinds of fry as soon as they are caught; but as they would be too small to handle, their knowledge would be of little practical value. In a week or so they become large enough to distinguish one from the other. After the fry are collected from the small traps they are put into a floating reservoir made of net, exactly like the trap shown in the sketch, but much larger in size, where they are kept until purchased for conveyance inland.

Those sold for breeding in the neighborhood are carried on the shoulders of coolies in water-tight baskets to the ponds and lakes, of which there are a great number in this circuit. Along the Yangtse fry, is sold by the jar or bowl, according to the quantity of fish it contains, and from five to six hundred cash (equal 1s. 8d. to 2s.) appears to be the average price per jar, according to the statement of the boatmen.

Most of the fry is conveyed inland by boats, which come from the interior for the especial purpose of loading with this freight. These peculiar-looking craft generally hail from Kan-chow-su, a large town to the south of the province, on the Khan River; also from Kuei-hsi-hsien, in Kuanghism department, to the east of the province; and those that load here generally rendezvous at Kuan-pai-chia, a small village about a mile west of Kiu Kiang, on the south bank of the river. Tea-boats are likewise used to carry fry, but not so extensively as those from Kan-

* Sketches illustrating the article were forwarded to the office of "Land and Water," London.

chow. Foreign residents on the Yangtse are too well acquainted with the craft to need any description.

The Kan-chow boats, or *yu-miao-chuan* (spawn-boats), are of much larger carrying capacity, and measure about 78 feet long, 15 feet beam, 11 feet from bottom to top of mat-cover, and draw, when loaded, from 3 to 4 feet. They are built in water-tight compartments, and are propelled by sails, tracking, or *yuloeing*—that is, by long sculls rigged out about 18 inches or two feet from either side of the boat, on outriggers, forward of the mainmast, and worked parallel to the side of the boat by four or six men at each scull. About twenty men comprise the boat's crew, who also attend to the fish in turus, their wages averaging 2,000 cash (equal 6s. 8d.) per month, with food. The boats are worth from 450 to 500 taels each (£150 to £167). Their cargoes brought to this port consist chiefly of timber (hewn as if for railway sleepers), wood for making coffins, planks, water-chestnuts, water-chestnut flour, grass-cloth, and sundry sweet-smelling flowers; probably small speculations of the crew, such as *Kuei hua* (*Olea fragrans*), *Mo-li-hua* (*Jasminum*), *Lan-hua* (*Epidendrum*), and *Tay-lai-hsiang* (*Stephanotis*), &c., which fetch a good price here.

But as several of these boats are nearly laden, it will be curious to see how they stow their freight. From the bottom boards of the boat to the level of the gunwale we find the holes filled with red earthenware jars (made of flower-pot clay), each measuring 18 inches in diameter and 12 inches deep, arranged in tiers, one above the other, five high, and as we counted eleven jars on the top row amidships of the two tiers put into a compartment, between which room is left for a man to pass, we may roughly estimate one hundred jars in each compartment, or five hundred jars in the five sections into which the hold is divided. A stout plank, about 5 inches broad, is laid across the wide-mouthed jars to support the upper ones, and to spread the weight more evenly, but the plank is not so wide as to interfere with the bailing out of the vessels. The jars are fastened to the sides of the compartment by a little splint of bamboo, made fast to an eye in the bulk-head, and which is made to catch under the unturned rim of the jar, on the same principle that a small-mouthed vessel is lifted by a piece of wood being put crosswise into the opening. To strengthen the rim, it is sometimes bound round with a bamboo hoop. On the upper row of jars another plank is laid to receive the water-tight baskets, which, being much lighter than the jars, are placed on the top, and piled up from the level of the gunwale to the roof of the boat. The baskets are securely lashed to poles braced athwart the boat to prevent their sliding out of position, as at such a height a slight knock would capsize them, although they are placed in a wicker-stand to steady them and ease the strain on the sides of the baskets.

As the number of these baskets appears to be about the same as that of the jars, we have a total of say one thousand jars and baskets of

fry in one boat. After all the internal arrangements are completed the fry are poured into the jars and baskets, and when all are full, the boat proceeds on her voyage. Kan-chow-fu, as I have remarked, is the chief market for spawn, but much of it finds its way into the Canton, Fo-kien, and Che-kiang provinces, when it has to be carried across the boundary range of mountains, about a day's journey, before gaining the waterways of the neighboring provinces.

The water is changed day and night, and after the muddy Yangtse and Po-yang Lake have been left the young fish require feeding, chopped yolk of hard-boiled egg being the food administered to them, with a certain amount of bread paste. A cargo of fry is estimated to be worth from 400 to 500 taels (£133 to £167), but on arrival at its destination realizes fully 1,000 taels or £300, the fish being then sold at so much apiece instead of by the jar.

Reliable information as to the mortality *en route* could not be ascertained, but all agreed that it was considerable, though chiefly dependent on the "good luck" accompanying the boat. The distance by water to Kan-chow is 1,055 li or 350 miles, and occupies from ten to fifteen days, according to the weather. The navigation is against the stream all the way after entering the Po-yang Lake. During the journey the fish are separated into different jars; the most important thing to be observed is to keep the wild fish (*yay yu*) from the domestic fish (*chia yu*); the former, said our informant, being of a restless nature, will not live peaceably in confinement, but commences to prey on the others.

The *Kan yü* or pike appeared to be the wildest fish, and most to be dreaded. The fry caught here and conveyed inland is chiefly that of the *Pang tou yü*, *Kuei yü* (perch), *Lien yü* (bream), and *Huen yü*, drawings of which are given.

The *Pang tou yü* measured 24 inches long, 13 inches girth, and weighed 7 pounds, but it often attains a weight of 20 pounds to 24 pounds, and 4 feet in length. Its flesh is rather coarse and flavorless, which is the chief complaint of most Yangtse fish. It is sold here at this season of the year (May) for 40 cash, say 1½*d.* per catty, equal to a pound and a third. This is, of course, river-caught fish. *Kuei yü* (perch), or "Mandarin fish," as our "boys" often call it, from the fact of its being the best fish to be found in the market almost at all times of the year, grows to a large size, is of excellent flavor, and very firm if full-sized. The specimen in the illustration is only average size, and measured 23 inches in length, 18 inches round the body, and weighed between 7 pounds and 8 pounds. The price ranges from 40 to 60 cash, equal 2*d.* to 3*d.* per catty (1½ pounds), according to season and time of day; but even at the latter price, "Mandarin" fish would not be a very expensive luxury, yet the lower classes seldom indulge in it. After the *Kuei yü*, the *Lien yü* ranks next, being a rich and firm fish. It often grows 3 feet long and 20 pounds in weight, but the dimensions of the one in the illustration were 22 inches long, 13 inches girth,

and weight 6 pounds. The *Huen yü*, though a coarse-looking fish, has an excellent flavor, and in the proper season is a very acceptable change at one's table, after the everlasting perch with which our cooks continually supply us. The length of the specimen given was 17 inches, $8\frac{1}{2}$ inches round, and weighed between 7 pounds and 8 pounds. The fry of the *Shih yü*, or shad, which ascends the river in May to spawn, does not appear to be caught or bred in ponds or lakes. It is greatly esteemed by the Chinese, and is undoubtedly the best fish of their rivers. The season for it is soon over, lasting from about the middle of May to the third week in June. In former years this fish used to be taken from Nanking to Peking for the Emperor's table, but the labor of getting it there fresh was so trying to the people engaged to carry it, that the Emperor was induced to forego this luxury, and the practice was discontinued.

The pike of these waters grow to a very large size, as will be seen from the cut forwarded, the dimensions of which were 49 inches long, 21 girth, and weight 36 pounds. All attempts made by Europeans at fishing with hooks appear to have failed, few even being rewarded with as much as a bite, nor are Chinese often seen angling with rod and line on the Yangtse. The system of taking spawn by forcible parturition as practiced in the United States—a long description of which was given in Harper's Magazine for June, 1874—does not appear to be known along the Yangtse, and it is a question which fish-culturists can decide, whether the Chinese method of spawn collecting, or that adopted in America and Europe, is the most effective.

It is said that at Canton fish are caught and their spawn expelled, and afterward impregnated with the milt of the male fish, as described in the magazine quoted, but the statement has yet to be verified.

