Lays of the Running Brook

And of Still Waters

LADY COLIN CAMPBELL

A Book of the Running Brook:

And of Still Waters

BY

Gertrude Elizabeth (Blood)

LADY COLIN CAMPBELL

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TO

W. H. P. AND W. M.

THIS LITTLE BOOK IS INSCRIBED

AS A SLIGHT TOKEN OF THE AFFECTION

OF

THE AUTHOR.

"A cold, sweet, silver life, wrapped in round waves,
Quickened with touches of transporting fear."

PREFACE.

AT the time of the Fisheries Exhibition, three years ago, public attention was much attracted to the subjects of fish culture and fish supply. There were sixpenny fish-dinners; and fishes in every stage and shape, alive and dead, in salt water and in pickle-bottles, were *the* subject of the day. One might have exclaimed with Mercutio,—

"Oh, flesh! flesh! how art thou fishified!"

The papers were full of a wordy corre-

spondence on the merits and demerits of acclimatization of various foreign fishes. But the fish craze, like other crazes, ran its course, and after a few months was practically forgotten.

Yet surely a question of such vital importance as the supply of cheap and wholesome food to a vast population merited a better fate than consignment to the waters of oblivion. Is it not a ghastly mockery that in a country surrounded by seas teeming with fish there should be found utter destitution in our great cities? The expenses of deep-sea fishing, the boats, the nets, the trawling gear, the risks attendant upon stormy weather, and a thousand other excuses are all made the most of by the "Fish Ring" to keep up the exorbitant price of fish in the market. Fish being creatures that cost nothing

to "raise," as the Americans say, ought to be food within the reach of the very poorest, and it is therefore only by enlarging on the expenses of its capture that a colourable excuse is given for its present price. If, therefore, good fish can be had in large quantities without any outlay of capital for fishing gear, and without any of the dangers which deep-sea fishermen have to face, there might surely be found landlords, both philanthropic and shrewd, who would turn their attention to the question, and make use of their ponds and lakes for the benefit both of their own empty pockets and of the emptier stomachs of their poorer brethren.

It was in the hope of fixing further attention on this neglected wealth of English waters, that a series of articles was undertaken during the

winter of 1885-6, for the Editor of the *Saturday Review*. With his permission they are here collected for re-issue in handier form.

GERTRUDE CAMPBELL.

2, VICTORIA MANSIONS, S.W.
May, 1886.

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"Hath not old custom made this life more sweet
Than that of painted pomp? Are not these woods
More free from peril than the envious court?
Here feel we but the penalty of Adam,
The seasons' difference, as the icy fang
And churlish chiding of the winter's wind,
Which, when it bites and blows upon my body,
Even till I shrink with cold, I smile and say:
'This is no flattery: these are counsellors
That feelingly persuade me what I am.'
Sweet are the uses of adversity,
Which, like the toad ugly and venomous,
Wears yet a precious jewel in his head.
And this our life, exempt from public haunt,
Finds tongues in trees, *books in the running brooks*,
Sermons in stones, and good in everything.
I would not change it."

As You Like It.

EELS AND ELVERS

CHAPTER I.

EELS AND ELVERS.

EELS are among the mysteries of this world. In spite of the way in which Dame Science has persistently poked her nose into most things, and has harried them and laid them bare, she has succeeded in discovering but little about eels and their mode of life. However, it would be rash to go as far in our confession of ignorance as a writer recently did, and declare "that we know next to nothing of eels beyond the periods of their migration." If we knew nothing more than that, we should indeed know but little, as in many places eels never migrate at all, but grow fat and flourish from year to year in the pond or lake where they were born, without ever leaving it to seek the brackish

water of estuaries which some authorities deem necessary to their existence. The same writer asserts that the distinction between "shovel-nosed" and "pointed-nosed" eels is purely "fanciful," and accounts for the difference by saying that "most fish develop a shovel-nose when they are working up stream." If this were the case, an eel would have a shovel nose in the spring and a sharp nose in the autumn. Such a capability of altering his features would be certainly open to envy; but, unfortunately for this theory, the structure of the two fish is materially different, and the single fact that the shovel or broad-nosed eel has 115 vertebræ, while his sharp-nosed relative possesses only 113, is sufficient to prove the fallacy of the idea that the two fish are identical.

Of fresh-water eels, as apart from their mighty cousin the Conger, there are three distinct kinds —the sharp-nosed eel, the broad-nosed or frog-mouthed eel, and the snig. Of these three, the sharp-nosed eel is both the largest fish and the best eating, though some prefer the snig eel as having a superior flavour. The snig, however, in spite of its excellence, has not the same value

as the sharp-nosed eel; for it seldom, if ever, attains more than half a pound in weight. The sharp-nosed eel, on the contrary, attains an enormous size. One on record taken in the Medway, not far from Rochester, weighed 34 lbs., measured 6 ft. in length, and had a girth of 25 ins. Another eel, taken in Kent, weighed 40 lbs., and measured 5 ft. 9 ins. Yarrell speaks of having seen at Cambridge the preserved skins of two which had weighed together 50 lbs.; the heaviest 27 lbs., the other 23 lbs. But these instances, though not to be regarded as apocryphal, are still very exceptional; and a fair average weight for sharp-nosed eels is 6 lbs. Eels of even 10 lbs. weight are not common, and Mr. Frank Buckland speaks of one of that size as being the largest he had ever seen.

From time immemorial eels have been much esteemed by epicures, more perhaps in ancient days than they are now. Both Aristotle and Aristophanes mention eels in terms of high praise; indeed, the former may be considered to have known more about eels than the contemporary we have already referred to, for he

recognized at least two distinct species of eels. By the Egyptians eels were regarded with great abhorrence as the embodiment of an evil demon; but other nations did not share the prejudice, for the Bœotians, who were celebrated for their eels, used them as sacred offerings. Misson, in his travels, tells of a vow made by the inhabitants of Terracina, a seaport of Italy, when besieged by the Turks. They vowed to offer twenty thousand eels a year to St. Benedict if he would deliver them from their peril. Whether a fond memory of stewed eels touched the saint we do not know, but the siege was raised, and the Benedictine monks got their eels every year from the virtuous and grateful inhabitants. The Venerable Bede mentions the eel-fisheries of Britain in his "History of the Anglo-Saxon Church," and Thomas à Becket, when he travelled in France, "expended the large sum of a hundred shillings in a dish of eels." Any one who could now sit down to cope with a dish of eels of the value of five pounds would indeed have gastronomic capabilities likely to make an alderman die of

envy. But in the eating of eels, whether plentiful or scarce, it is well to remember the advice given in the ancient medical book entitled "Regimen Sanitatis Salerniæ:"—

> "Who knows not physic should be nice and choice
> In eating eels, because they hurt the voice.
> Both eels and cheese, without good store of wine
> Well drunk with them, offend at any time."

For a long period the most extraordinary theories were accepted regarding the birth of young eels. Aristotle believed they sprang from the mud (wherein he was not far wrong, as eels deposit their spawn in mud and sand); Pliny maintained that young eels developed from fragments separated from the parents' bodies by rubbing against rocks; others supposed that they proceeded from the carcases of animals; Helmont declared that they came from May-dew, and gave the following recipe for obtaining them:—"Cut up two turfs covered with May-dew, and lay one upon the other, the grassy side inwards, and then expose them to the heat of the sun; in a few hours there will spring from them an infinite quantity of eels."

Of the somewhat less ancient superstition of one's childhood that horse-hairs cut up and deposited in water would turn into eels it is hardly necessary to speak, for who cannot remember those unpleasant little bottles, erst used for medicine, which garnished the nursery, and in which the propagation of eels from horse-hair was carried on with the profound faith of childhood?

Eels generally shed their spawn in April; and, when not hindered, they almost invariably choose an estuary, where they scatter the spawn loosely in the sand or soil. But that an annual visit to the sea is by no means necessary to their existence is proved by the fact that many eels who inhabit inland ponds and lakes never go to the sea at all. A gentleman digging in the month of October in the gravel banks of the river Stour found the place "alive with young eels, some of them scarcely hatched, at the depth of from five to fifteen inches;" and at one of the meetings of the British Association for the Advancement of Science a member stated that he had seen a considerable number of young eels rise

up through a small opening in the sand at the bottom of a small stream, the Ravensbourne. The greater number of eels, however, do visit the sea, and the "passing up" a river of the young eels is one of the most curious sights of natural history.

This passage of young eels is called *eelfare* on the banks of the Thames; and it has been thought by some that the term *elver*, which on the banks of the Severn is used indiscriminately for all young eels, is a corruption of the word *eelfare*. In the Thames this *eelfare* takes place in the spring, in other rivers in the summer; and some idea of the numbers of these young eels, each about three inches long, may be gathered from the record of Dr. William Roots, who lived at Kingston in 1832. He calculated that from sixteen to eighteen hundred passed a given point in the space of one minute of time. These baby eels travel only by day and rest by night. In large and deep rivers, where they probably find the current strong, they form themselves into a closely compacted company, "a narrow but long-extended column," as it has

been described; but in less formidable streams they abandon this arrangment, and travel, each one more or less at his own sweet will, near the bank.

The perseverance of these little creatures in overcoming any obstructions they may encounter is quite extraordinary. The large flood-gates, sometimes twenty feet high, to be met with on the Thames, might be supposed sufficient to bar the progress of a fish the size of a darning-needle. But young eels have a wholesome idea that nothing can stop them; consequently nothing does. As one writer says, speaking of the way in which they ascend flood-gates and suchlike barriers, "Those which die stick to the posts; others which get a little higher meet with the same fate, until at last a sufficient layer of them is formed to enable the rest to overcome the difficulty of the passage." The mortality resulting from such "forlorn hopes" greatly helps to account for the difference in the number of young eels on their upward migration, and of those who return down stream in the autumn. In some places these baby

eels are much sought after, and are formed into cakes, which are eaten fried.

The term elver, which, as we have said, is in some places indiscriminately used to denote all young eels, in reality belongs only to the "transparent" eels, occasionally to be found among their more opaque brethren. These elvers are so transparent that most of the internal organs and the action of the heart and blood-vessels can easily be seen. They have been found with the characteristics of both sharp-nosed and broad-nosed eels; and there is no particular season for their appearance, for they have been caught in winter and summer. In spite of their transparency, or rather on account of it, they have remained one of the many mysteries of the eel family.

One of the greatest peculiarities possessed by eels is that they have a second heart situated in the extremity of their tails; and, of course, in the transparent elvers the action of this heart can be more easily noted than in the ordinary eels. In all, however, its action is plainly manifest, especially if the fish has been out of

water any time or is exhausted, a fact known to the street vendors of live eels, who therefore are careful to cover their eels with sand to hide the caudal pulsations. Dr. Marshall Hall, who in 1831 discovered this secondary heart, says of it that "the action of this caudal heart is entirely independent of the pulmonic heart; while the latter beats sixty, the former beats one hundred and sixty times in a minute. It continues for a very long time after the influence of the pulmonic heart is entirely removed." It is probably owing to this caudal heart that the eel's tail is so highly sensitive and so strong. Eels can use their tails almost like hands; for instance, if confined to a tank or bucket, they will grasp the edge with this hand-like tail, and by its help lift themselves bodily over.

Eels are very clean feeders; if possible, they like their food alive, and in all cases it is most essential that it should be fresh. Even the slightest taint is too much for their keen sense of smell and taste. They are sometimes seen cropping the leaves of watercresses, and other aquatic plants, as they float about in the water; but as a rule their food is altogether

animal. They are immense devourers of spawn of all kinds of fish. There are certain well-known spawning-grounds in the Norfolk Broads, where the roach and bream collect in vast numbers to spawn in the spring. To these grounds the eels follow in hundreds. Mr. Davies, in his pleasant book on "Norfolk Broads and Rivers," speaks of this, and adds: "You can hear the eels sucking away at the spawn in the weeds; and they gorge themselves to such an extent that they will lie motionless on their backs on the gravel, with distended stomachs; and when caught by the bab they will frequently die during the night, instead of living for days, as an eel will otherwise do in a boat."

There are a good many ways of catching eels; the commonest, of course, being by the eel-bucks so often to be met with on the Thames. Eel-bucks intended to catch the sharp-nosed or frog-mouthed eels are set *against* the stream, and are set at night, as those two descriptions of eels feed and run only at night. The snig eel, which is chiefly found in Hampshire, feeds by day; and fishermen have found by experience that snigs are taken in the eel-bucks only

if they are set *with* the stream, instead of against it. In Norfolk, where immense quantities of eels are caught every year, the capture is mostly effected by eel-sets, which are nets set across the stream, and in which the sharp-nosed eel is the one almost invariably taken.

Besides these eel-sets, however, the Norfolk Broadmen use "babs," a mode of fishing which can hardly be called sport in any sense. The "bab," or "clod," as it is sometimes called, is a number of lobworms threaded on pieces of worsted, and all tied up in a bunch not unlike a small mop. The bab is then tied on to the end of a cord attached to a stout pole. The eel's teeth get entangled in the worsted as soon as he attempts to take the bab, and he can then be lifted out of the water into the boat, if the angler be in one, or else allowed to drop off the line into a pail, which the angler puts on the bank at a convenient distance from his standing-place. Norfolk "babbers" frequently catch four stone weight of eels to a boat per night, especially in the spawning-grounds.

Night-lines also are much used for eels. These are long lines, weighted heavily at each

end and in the middle, and garnished with baited hooks one yard apart. "Sniggling," immortalized by Mr. Burnand in his "Happy Thoughts," is one of the most favourite ways of catching eels, while "Stitchering," a Hampshire method, is perhaps one of the most amusing, though the stitcherer probably catches fewer eels than any other eel-hunter. The only apparatus used is an old sickle, worn short and chipped so as to present something of a saw-like edge. This is tied firmly on to a light pole about twelve feet long. Armed with this the stitcherer betakes himself to the water meadows. In the wide deep drains used for irrigation eels abound; and the object of the stitcherer is to thrust the sickle under the eel's body, and, with a sudden hoist, to land him on the bank, from which he is transferred to the bag. That you have every chance, when on a stitchering party, of having your eye poked out, or your ear sawn off, of course only adds the necessary amount of danger and pleasurable excitement, without which all sport is tame.

Of all forms of eel capture, however, there is none to compare to spearing, of which there are

two methods. The Norfolkmen mostly use "picks" formed of four broad blades, spread out like a fan, between which the eels get wedged. These are mounted on long slender poles, to enable them to be thrust into the mud, where the "picker" notices the tell-tale bubbles rise, denoting the presence of "Anguilla." Eel-spearing of this kind takes place chiefly in winter, but there is another form of the sport called "sun-spearing," which is much sought after in the Irish loughs during the months of June and July. In the early sunny mornings at that time of the year, when the water seems to be principally composed of sunbeams, with a little hydrogen and oxygen added, the sun-spearer sallies forth in any little boat he can lay his hands on. Standing up in the bows, and, if alone, using his spear to propel the boat gently along, he steals over the crystal waters of the lough. Presently he sees the gleam of the "silver" eel as he lies quietly at length on the sandy bottom. The spearer takes aim; there is a sudden "splitting of the atmosphere," as Mark Twain would say, a splash, and either

Anguilla comes up writhing on the twelve close-set teeth of the sun-spear, or the spearer has taken a header into ten feet of water. If he is a tyro at the apparently simple art of sun-spearing, it may safely be prognosticated that, when he makes acquaintance with the eel he is after, the meeting will be more likely to take place under water than above it.

Eels have the immense merit in the eyes of all careful people that they more than repay any cultivation bestowed upon them. There is always a demand for eels, and they seem never to be out of season. The London market is chiefly supplied from Holland, the eels being brought over alive in welled vessels. Queen Elizabeth gave a free mooring to these Dutch skoots, and this privilege has been taken advantage of up to the present time. The Dutch eels, however, are very much inferior in flavour to the English, and it seems, therefore, somewhat a pity that they should have almost a monopoly of the London Market. The Norfolk eels, caught in such huge quantities, are nearly all sent to Birmingham and the Black Country.

In Scotland eels are looked upon with abhorrence, consequently eel fisheries may be said not to exist there. In Ireland, however, the eel fisheries are enormously valuable; the eel weirs on the Erne are said to bring in five or six thousand pounds sterling a year. At Ballisodare the eel fisheries were found to be greatly increased in value by the hanging of loosely-plaited ropes of straw or hay over any obstructions likely to bar the course of the elvers up stream. The ropes act as ladders, up which the elvers safely climb, and the immense annual destruction we have already spoken of is thus averted.

Eels cost but little to cultivate, never fail to find a good market, and are one of the richest and most nutritious forms of food possible to have. The late Frank Buckland showed his usual good sense when he declared that the English eel fisheries were not half developed, and that they deserved considerably more attention than they had hitherto got. That they should soon get this attention must be the hope of all those who do not like to see the good gifts of nature contemptuously thrown away.

WATER-WOLVES

CHAPTER II.

WATER-WOLVES.

IF water-wolves had nothing more to recommend them than the possession of the same amiable characteristics of strength, fierceness, and voracity as those of their warm-blooded namesakes, they would by now be as near extinction as their four-footed prototypes. But the water-wolf or pike has one immense merit, which, in spite of his many vices, makes him worthy of even more attention than he usually obtains—he is a most toothsome morsel when he has made proper acquaintance with the culinary art. His merit was so well acknowledged in early times that that worthy monarch, Edward I., who saw no reason why his subjects should be left to the mercy of a "Fish Ring," and there-

fore condescended to regulate the prices of the different sorts of fish then brought to market, fixed the value of pike higher than that of fresh salmon, and more than ten times greater than that of the best turbot or cod.

Those patriarchal times have changed. Fish Rings are no longer deposed by Fish Kings, and fish goes up in price from year to year. For fresh-water fish, always excepting trout, there is no market at all, and yet food of such a sustaining quality ought surely not to be inaccessible to the great mass of the population. That they do not despise what they can get of it is sufficiently clear to the olfactory nerves of any one who passes through the poor quarters of our great towns at night. Fried Fish seem to pervade the air, and, on closer inspection, are even more unsavoury to the eyes than they have already been to the nostrils. The refuse, the sweepings out of the great fish-markets, the fish that are too much "off colour" to be sold otherwise—all these easily account for the atmosphere of Leather Lane and suchlike fragrant thoroughfares. Cheap food it may be; wholesome food it certainly cannot be; for

unsoundness in fish is more absolutely poisonous than in any other class of food. And yet, while our poor population are devouring at comparatively high prices the offal of Billingsgate, our inland lakes, ponds, and broads are lying useless. We do not speak of the rivers; for the cultivation of such fish as pike and eels in rivers would probably raise an outcry amongst trout anglers, as trout have but little chance against the strength and voracity of the water-wolf. In ponds, large or small, however, pike would well repay cultivation, for they both grow and fatten with great rapidity. An increase of four pounds weight a year is said to be an ordinary average for a pike if well supplied with food, but instances are quoted of an increase of even ten and eleven pounds in the year.

"From the days of Gesner downwards," said Mr. Frank Buckland, "more lies have been told about the pike than any other fish in the world," which is saying a good deal, since lies are told so profusely about all animals, human or otherwise, who are gifted with any remarkable characteristics, whether pleasant or the reverse. However, the many historians of the

pike have hitherto kept clear of the supernatural; were-wolves and "loups-garou" have no imitators amongst the finny tribes. A ghostly pike, with lambent eyes and distended jaws, is too fearful an idea to be entertained for a moment.

But, if the pike historians have refrained from enlarging on supernatural water-wolves, they have by no means curtailed their imaginations in their description of the real fish. The Mannheim pike which attained a length of nineteen feet, and was captured in 1497 at the advanced age of two hundred and sixty-seven years, having in its gills a brass ring, whereon was engraved in Greek, "I am the first fish that was placed in this pond by the hand of Frederick II., Governor of the World, on the 5th of October, 1230," may certainly claim to be the most marvellous pike on record. "Its skeleton and ring were long preserved in the Cathedral of Mannheim," says Mr. Pennell in his "Book of the Pike," "but upon subsequent examination by a clever anatomist, it was discovered that the bones had been lengthened to

fit the story—in other words, that several vertebræ had been added. Another writer, M. Passon Maisonneuve, gives us further particulars concerning the ring—namely, that it was of 'Gilded brass,' and could 'enlarge itself by springs'—a highly necessary qualification if its wearer's growth is to be considered, and one which would seem not to be confined to this portion of the story alone."

Putting aside such-like monsters, which seem to be, in the words of Polonius, "very like a whale," most veracious historians agree that the pike rarely exceeds 40 lbs. in weight, at all events in these islands. That he should not be allowed to do so is certain from a gastronomical point of view, seeing that a young pike or jack increases in weight at the rate of 4 lbs. per annum during the earlier portions of his life, but that after twelve years he diminishes each year by 1 lb. to 2 lbs., a rate of diminution increasing as his age advances. Young pike are the best for eating, and by connoisseurs those of moderate size are much preferred to either small or large fish.

The ways of cooking pike are as many and various as his quality deserves. He can be roasted, boiled, braised, stuffed; he can be disguised "à la Chambord," with mushrooms, onions, and cockscombs; "à l'Egyptienne," with gherkins, eggs, truffles, and port wine; "à la meunière," "à la maître-d'hôtel," "en matelote," and a hundred other ways; in all of which he is superexcellent. And if he is thus savoury and delightful in his last hour, how much more is he worthy of all praise when he is alive from the angler who loves true sport. He is no miserable little trout, who will even allow himself to be *tickled* out of his native stream. The angler who means to compass the death of a water-wolf, "this solitary, melancholy, and bold fish," as Walton calls him, must have iron nerves; for fishermen have been known to "drop their rods in *sheer terror*" at the first rush of a pike on its prey.

As to what that prey may be the pike is not particular. Literally "all is fish that comes to his" jaws, with only two exceptions, a tench and a toad. There is a fond superstition that

accounts for the pike's leniency towards the tench on the ground that the latter is the pike's physician; and Camden in his "Britannia" was not afraid to say, "I have seen the bellies of pikes which have been rent open have their gaping wounds presently closed by the touch of the tench, and by his glutinous slime perfectly healed up." It is true that it would be questionable sanity on the part of the pike to eat his doctor; but the fact that the pike's eyes are on the top of his head, and that the tench lives at the bottom of the muddiest water he can find, may have something to do with this self-denial on the part of the water-wolf.

His own species enjoy no immunity from his universal greed; and there is good reason for believing that more young pickerels are devoured by their parents than by all their other enemies put together, not excepting eels, who, however, account to some extent for the enormous difference between the eggs found in the roe of the female pike and the comparatively small number of pike to be found in our rivers. Mr. Frank Buckland tells of a pike which was sent

to him, having been caught with rod and line in the Norfolk Broads. It weighed 32 lbs., five of which were represented by the roe, which contained no less than 595,200 eggs. In another pike, weighing 28 lbs., he found 292,320 eggs. It is evident, therefore, that the struggle for existence comes to young pickerels at a very early age, and that, when stocking either rivers or ponds, care should be taken to select pike as nearly of the same size and age as may be, so that the doctrine of the "survival of the fittest" should not be demonstrated after a time by the solitary presence of one ferocious monster.

If the comparatively small number of pike that survive out of the millions of eggs deposited is worthy of note, still more marvellous is the apparently spontaneous generation of pickerels in ponds where pike have never existed. Izaak Walton, like all other writers on fish, noticed this mysterious peculiarity; but, unable to account for it otherwise, he was inclined to adopt one of the romances of Gesner and his contemporaries. "It has been observed," he says of pike, "that where none have been put

into ponds, yet they have there found many; . . . 'tis not to be doubted but that they are bred, some by generation and some not, as namely of a weed called pickerel-weed—unless learned Gesner be much mistaken; for he says this weed and other glutinous matter, with the help of the sun's heat, in some particular months and some ponds apted for it by nature, do become pikes." The "glutinous matter," which the reverend angler wisely mentions, probably represented the spawn of some stray pike, for these fish are particularly fond of lying in beds of pickerel-weed, and depositing their spawn therein.

Pike have a curious instinct which sometimes causes them to embark on land-journeys in search of food. Mr. Newnham, an English resident at Antwerp, in order to test this theory of migration, made two new ponds, and stocked one with pike and the other with small fresh-water fish, such as dace, roach, and barbel. After two days he had both ponds emptied, when it was discovered that many of the pike had travelled by some means or other from

their own pond into that of their neighbours; and had devoured the greater part of them. That these pike should have taken less than two days to think out their marauding plan, and put it in practice, is an additional proof that the water-wolf is at least possessed of a prompt and decided character. These Antwerp pike attained their end (and that of the small fry), but another pike on record came near having a different fate. He adorned the Aquarium at the Zoological Gardens. One night the glass tank in which he lived broke, and the water-wolf, not appreciating being left thus high and dry, was found next morning by the keeper at a distance of twenty-four yards away, making for a piece of water. Fortunately for him, he was not allowed to reach it, for that pond contained the otters, who would no doubt have greatly appreciated a morning call from a fine young pike.

The pike therefore is decidedly an exception to the rule that fish have little or no intelligence. Even the size of his brain is worthy of respect. Its proportionate size as compared to the rest of the body is as 1 to 1,300; in the shark, whose

intelligence has so often been vaunted, it is only as 1 to 2,500; while in the tunny it is but as 1 to 3,700. The only thing that dulls the pike's intelligence is his greed; but even this may perhaps be caused by only an overweening confidence in his own gastric juices. With him as with so many other voracious animals, to swallow seems to be his only joy; palate he has little or none. Indeed, what an ill opinion of his powers of discrimination our ancestors had may be gathered from Sir Hugh Plat, who, in his "Jewel-house of Art and Nature," published in 1653, gives the recipe for the following toothsome morsel:—"Fill a sheep's gut with small unslaked limestones, and tie the same well at both ends, that no water get therein; and, if any Pike devour it (as they are a ravening fish and very likely to do), she dieth in a short time." Even a pike's "most strongly and rapidly dissolving gastric juices," as Dr. Fleming calls them, could hardly be expected to do justice to such a morsel.

That wise woman of ancient days, Dame Juliana Berners, paid special attention to the

capture of the pike; and certainly the following quaint instructions that she gave concerning the most suitable bait are composed in somewhat of a kinder spirit than is the recipe of Sir Hugh Plat:—

"Take a codlynge hoke, and take a roche or a fresh heeryng, and a wyre with an hole in the ende, and put it in at the mouth, and out at the taylle, down by the ridge of the fresh heeryng, and thenne put the hoke in after, and drawe the hoke into the cheke of the fresshe heeryng; then put a plumbe of lead upon your lyne a yarde longe from your hoke, and a flote in midwaye betwene; and cast it in a pytte where the pyke usyth, and this is the best and moost surest crafte of takynge the pyke. Another manere of takynge him there is; take a frosshe [frog] and put it on your hoke, at the necke, betwene the skynne and the body, on the backe half, and put on a flote a yarde therefro, and caste it where the pyke hauntyth, and ye shall have hym. Another manere: take the same bayte, and put it in assafetida, and caste it in the water wyth a corde and a corke, and ye shall not fayl of hym."

Such an attraction as a frog dipped in assafœtida would surely be strong enough to tempt even the most gorged of pikes from his lair. But even this voracity, which is so unanimously dwelt upon by pike historians, and so unfailingly taken advantage of by pike anglers, is one of his great sporting merits. A pike is

"game" throughout his whole existence; fear is to him unknown, he will attack anything or any one; even otters and men, his two most redoubtable enemies, inspire him with no terror. He is game to the last; and even when landed by his captor he fights on. Is it not recorded by that immortal sportsman, Mr. Briggs, that a pike not only bites, but "barks like a dog"? Bite he certainly does, and woe betide any triumphant sportsman who is in too great a hurry when disengaging the hooks from his victim's mouth. The *rôles* of captor and captive will be momentarily reversed, and the great canine teeth, the "serried pikes" of the water-wolf's mouth, will go near to meeting in *his* victim's hand.

Courageous and intelligent in life, succulent and savoury in death, what more can any fish be expected to be? And all pike-anglers will agree that no sea-fishing, except, perhaps, conger-catching, can be compared for excitement to the half-hour following the first "strike," when trolling or spinning for the "solitary, melancholy, and bold" water-wolf.

CARP CULTURE

CHAPTER III.

CARP CULTURE.

"THE carp is the queen of rivers; a stately, a good, and a very subtil fish," says Izaak Walton, and none of these grave utterances may be gainsaid. "Stately, good, and subtil," indeed, is the carp; and especially does he deserve the latter epithet, as all who have fished for him will agree.

No fish requires greater patience on the part of the angler. Shyness, intelligence, and caprice are the very essence of the carp's nature, and no fish poet has failed to notice the carp's intelligence.

> "Of all the fish that swim the watery mead,
> Not one in cunning can the carp exceed,"

is an expression of opinion quoted by Daniel in

his "Rural Sports," and another writer chimes in,—

> "The perch an idiot, and the carp a wit."

Both the brain and the nerves of the ear are very highly developed in the carp. Professor Owen says that "the average proportion of the size of the brain to that of the body in fishes is one in three thousand;" and Couch maintains that "in the carp, according to Blumenbach, it amounts to one in five hundred; this extraordinary development in the carp existing also in the portion of that centre of intelligence termed the prosencephalon, or what most nearly answers to the cerebrum, or seat of understanding, in the higher animals." It is no wonder, therefore, that it is seldom that a carp allows himself to be deluded by the wiles of his human enemies. Even old Walton, who excelled in the angler's chief virtue, seems to have been sorely tried by the "queen of rivers," for he begins his instructions to his pupil anent this fish in a manner which has something in common with Mrs. Glasse's famous receipt about the hare.

"I will proceed to give you some observations of the carp," says the Father of the Rod, "how to angle for him, and to dress him, *but not till he is caught* . . . and my first direction is, that if you will fish for a carp, you must put on a very large measure of patience, . . . and beind possessed with that hope and patience, which I wish to all fishers, especially to the carp-angler, I shall tell you with what bait to fish for him."

Authorities are not unanimous as to the date of the first introduction of carp into England, but as it is mentioned as a "deyntous fysshe, but scarce," in the Boke of St. Albans, printed by Wynkyn de Worde at Westminster in 1496, it is pretty obvious that Leonard Mascall was wrong when he claimed in 1600 to have been the introducer of this fish into English waters. In the Privy Purse expenses of King Henry the Eighth in 1532, are to be found various items of rewards given to persons who brought "carpes to the king." To those persons who have a fancy for trying out-of-the-way dishes, we would recommend Ben Jonson's tempting recipe,—

"The tongues of carps, dormice, and camels' heels
Boiled in the spirit of Sol."

It is generally believed that these fish were

first brought over to England by monks who were wise enough to appreciate their merits. Carp were peculiarly well fitted to receive the attention of monasteries, for no fish were better adapted to thrive in the stews and fishponds where the monks of old usually kept their finny live-stock.

Most fish that do well in ponds yet would prefer a river, but the carp, on the contrary, attains his greatest size and excellence only in ponds.

Carp have been introduced into both Ireland and Scotland, but in the latter country the efforts to establish them have not been successful. In most places in Scotland they either do not breed at all, or they breed very slowly, which, for so remarkably prolific a fish, is curious. However, the endless caprices of carp must be accepted.

Professor Spencer F. Baird, United States Commissioner of Fish and Fisheries, was the first American who saw how very important the question of food-fish was becoming. After many investigations carried on chiefly in

Europe, he decided in favour of experimentalizing on carp, and began operations by importing some from one of the breeding establishments in Germany. Captain Milton Pierce, Secretary of the American Carp Cultural Association, gives a most interesting account of the breeding from these imported German carp, and the efforts to improve on them, until at last these efforts were crowned with success by the production of the scaleless American carp. "It has been our aim for years." says this triumphant carp culturist, "to breed from those specimens having the least quantity of scales, and this scaleless carp is simply the result of this careful breeding. It is practical evolution —from full scale to scaleless types."

The Americans are the first who have devoted so much attention to this question of scales *v.* no scales. This sublimated and scaleless type of carp, which should be "as smooth as a frog," is peculiarly the result of American breeding. The Germans have three kinds of carp, which are known as scale, leather, and mirror carp, but none of these are as perfect either in shape

or in quality as their scaleless American cousin.

In France little or no attention is given to the scale question, and the carp-breeding there, though most extensive and lucrative, is carried on in an unsystematic manner, differing entirely from that advocated elsewhere. Those who have visited the highlands of the Limousin, will have noticed ponds of all sizes, many of them large enough to be dignified by the more grandiloquent name of lakes, but to the country people one and all *étangs* and nothing more. These ponds are among the chief sources of wealth of the country, which is mostly but poor soil for cultivation, as a great part of it has only recently been reclaimed from moorland and heather; they are stocked with carp, and once every three years a great fishing takes place.

All the able-bodied men of the country-side are engaged for a certain day in October to meet at one of the ponds; that on the highest level being taken first. The sluices are opened three days previously, and the water allowed to

run gradually off, leaving that bed of deep mud which seems to be one of the necessaries of carp existence. When there is only a thin rill of water left trickling down the centre of the erstwhile pond, the fishing begins. On all sides the carp lie floundering, panting, gasping on the expanse of mud; in some places they are two or three deep on top of one another. Though the quantity of carp in these ponds is something extraordinary, they do not seem to suffer individually from their great numbers; for the fish are remarkably fine and heavy.

The men wade through the mud, catching the carp by the gills, and flinging them on to the bank. There they are weighed by men who have come with carts from the nearest town to buy the fish; and after the weighing the carp are packed amongst straw in the carts as tightly as possible. When the carts are full they return to the town, and the carp are then placed in tanks. A carp takes a good deal of killing; and though being tightly packed in straw for a whole day and jolted down-hill for perhaps four hours may strike him as a novel

experience, it does not do him the very least harm; as soon as he is released from durance vile and placed in the tanks, he resumes the even tenour of his way, probably till the following Lent, when, as *carpe au bleu*, *carpe en matelote*, *carpe au vin blanc*, and in many other still more savoury disguises, he helps the faithful Catholic through his forty days' trial.

While the fishing goes on, groups of women make fires on the bank, and they heat cauldrons of soup, mixed with strong red wine, which is served out unceasingly in bowls to the soaked and muddy fishermen. This is a necessary precaution in a climate where people are sometimes snowed up for days early in November. The gipsy fires and groups of women, the men wading through the mud and water, mostly dressed in frieze coats of the most brilliant hues, and with high boots to protect them somewhat during their task; the piles of shining, glistening fish; and, in the background, the carts waiting to take away the spoils, altogether make a highly picturesque scene.

Amongst the carp are always found a number of pike, one of the mysteries of pisciculture, for the very greatest care is taken to eliminate them from the ponds on account of the immense damage they do. As the ponds are drained dry, and completely re-stocked every three years, one would imagine that the extermination of the pike would not be a very difficult matter; but when the triennial fishing takes place, the irrepressible pike is again to the fore. As soon as the fishing is over in one pond the sluices are closed, and the pond allowed to fill gradually, while the fishermen betake themselves to any other ponds that are to be fished the same year, according to the date of their re-stocking. When the empty ponds are again full of water, the breeding-pond is drawn upon to supply young fish. This breeding-pond is never drained dry of water. When young fish are required, the breeding-pond is drawn with nets, and only young fish are taken; the old ones are returned to their home to breed undisturbed, while their progeny are translated to the fishing-ponds for their allotted span of three years.

Of the profit to be derived from this form of pisciculture, some idea may be gathered from the fact that half a franc a pound is the price given for the fish when weighed on the bank of the pond in which they have been caught. There is no expense in seeking a market, with possible loss on the fish by the way—in fact, no expense of any kind except the pay of men and boys employed in the triennial take, which is but a small item in comparison to the enormous profit on the hundreds of heavy fish which have cost absolutely nothing up to the time of the sale. It is no wonder, therefore, that the landed proprietors in the department of Corrèze consider that the acres under water are infinitely more profitable and far safer investments in every way than those under agriculture. We islanders are too apt to think scornfully of any freshwater fish except trout, but the French can teach us as much in this part of the great question of food supply as in the others. It has often been said that a Frenchman will live succulently where an Englishman will nearly starve; and when we see all our ponds and

inland broads lying unused and their capabilities of supporting and fattening fish wasted, we must feel in all humility that our French brethren make a better use of the bountiful gifts of Nature than we do.

COUSINS OF THE CARP

CHAPTER IV.

COUSINS OF THE CARP.

OF all freshwater fish that are worth cultivation for the table the tench gives the least trouble. Almost any pond will suit his contented mind; like the modest violet, he shuns the "eager eye of day," and the deeper and quieter the pool in which he is placed, the better he is pleased. To him as to his near relation and close ally, the carp, swift rivers are distasteful; gravelly beds, clear running water, are abominations. A deep quiet pond, with a bottom of mud, in which he can find the larvæ upon which he principally subsists, is more to his mind; or, better still, one of those deep pits from which clay has been dug for bricks. When these pits are filled with water, tench thrive greatly therein; the quiet which is conducive to meditation

seems also conducive to adipose tissue, and in such situations tench grow fat and multiply in a manner most edifying to their proprietor.

Tench are found in most slow-running rivers and ponds in Europe; and in many places are greatly esteemed for the table. In England they are found in great quantities in Norfolk and Suffolk, and also in the Southern and Midland counties, but further north they gradually diminish. In Scotland they are rare, and the few instances of their presence there have to be accounted for by Yarrell by the fact that the ponds in which they exist are supplied solely by rain-water—the hard spring water of Scotland being utterly unsuited to the requirements of tench. However, if rain-water were the only thing wanted for a tench's happiness, it seems strange that he should not thrive under Scotch skies.

Tench are pretty widely distributed in Ireland, for they are known to exist in ponds in the counties of Cork, Dublin, and Kilkenny. The non-appearance of the tench in the North is probably owing to his dislike of cold. In the winter he generally buries himself in the mud,

and, as Couch remarks, "there lies concealed, perhaps for a longer time than is pleasing to himself, although from the power he possesses of extracting the minutest portions of air from almost exhausted water, he continues to live where other fish must have perished." This peculiarity has afforded scope for experiments, which have proved that the tench is able to breathe when the quantity of oxygen is reduced to the five-thousandth part of the bulk of water; ordinary river-water generally containing one per cent. of oxygen. Dr. Roget observes "that this fact shows the admirable perfection of the organs of this fish, which can extract so minute a quantity of air from water, to which that air adheres with great tenacity." Obviously the power to live under circumstances which would kill many other fish, greatly increases the value of the tench as a marketable commodity. Like his cousin the carp, he can be conveyed long distances to market, packed in straw or wet moss, and if not sold, can be brought back to the pond or stew whence he was taken, to await another occasion for sale.

In England the merits of the tench as food are but little known, a remark that could equally be applied to many other good and wholesome articles of food in favour with our more enlightened Continental neighbours. In France and Italy tench are highly esteemed; even in small country towns in France as much as one franc and upwards a pound is given for them. In Holland tench are considered a first-rate delicacy, equal to turtle.

Much of the excellence of tench, however, depends upon their feeding; but this may be said to be the case with all fish as well as animals. Frank Buckland says that "the natural food both of carp and tench is the larvæ of insects, small worms, and the soft parts of various aquatic plants," and Mr. Gillbank, an eminent botanist and a friend of Mr. Buckland, adds that "the water in which they (tench) are placed cannot be too soft." The slime at the bottom of ponds in which tench love to bury themselves does not seem to affect their flavour. Yarrell mentions some tench who were taken out of Munden Hall Fleet in

Essex, "which was so thick with weeds that the flew-nets could hardly be sunk through them, and where the mud was intolerably fœtid, and had dyed the fish of its own colour, which was that of ink, yet no tench could be better grown or of a sweeter flavour; many were taken that weighed nine and some ten pounds the brace." It would have been simpler to have given the weight of any individual fish, as the above method of reckoning is apt to remind the reader of the Yankee's boast about the mosquitoes of his native land—"*Many of them* would weigh a pound!" Tench, however, do attain a fine size, though not so great a one as the carp, whom, however, they surpass in beauty of colour and excellence of meat. Tench seldom attain a greater weight in this country than seven or eight pounds, though in Italy they sometimes grow to twenty pounds. The usual weight of tench in small ponds is from two to three pounds, and this average is attained only under favourable circumstances as regards water, numbers, and feeding. In 1874 a tench was taken at Sonning that weighed five pounds,

and at Elstree Reservoir, one year when the water was very low, a number of tench of three and four pounds each were caught. Mr. Manley mentions one glorious "take" of tench in the Avon a few miles above Christchurch, at which he assisted. With the help of nets, five tench were taken averaging over five pounds each, the largest weighing close upon six pounds. Such splendid tench, however, are rare, and most anglers for this wary fish esteem themselves lucky if a day's sport produces several two-pounders.

Yet in water that suits them tench are marvellously prolific; in a fish of four pounds' weight Bloch counted nearly three hundred thousand ova. They spawn about the middle of June, or, as Willoughby remarks, "when the wheat is in blossom." The development of the grains of spawn is extraordinarily rapid. In Muller's *Archives* for 1836 M. Rusconi observed:—

"Soon after the application of the milt the ovum loses its spherical form, and swells out into the form of a pear, and at the point where the swelling begins it is surrounded

with a cluster of microscopic globules, which before were spread all over its surface. In half an hour the pear-shaped excrescence is divided into four globules, which in another quarter of an hour are subdivided into eight, and after a similar period into thirty-two, which still remain clustered together on the top of the egg. In another half-hour more globules appear, which become less in size as they increase in numbers, and at length, from their minuteness, that part of the egg to which they are attached becomes almost as smooth as before they made their appearance. The embryo fish is now seen in the form of a whitish transparent speck, which is the rudiment of the backbone. The organization of the skin then proceeds, and the embryo as it is coiled round the yoke increases in length until the head becomes perceptible. In forty hours from the first this embryo tench gives signs of motion, and in further twelve hours it has freed itself from the skin of the egg, at which time the fish is two lines in length, and the blood is of its natural colour. For some hours after leaving the egg the young appear inert; lying on their sides and unable to swim, but when the swimming bladder becomes developed they assume their proper position and activity."

In stocking ponds with tench it will be found that the larger and finer the fish that are turned down for breeding the better; it is the most certain way of obtaining good-sized fish for table in the shortest space of time. Ponds should not be allowed to get over-stocked, and from the breeding-pond the small fish should

be withdrawn from time to time, and deposited elsewhere as much for their own benefit as that of their parents. Two males to one female is the right proportion of the sexes amongst the tench, and certainly not less than three to two at the outside should be turned down for breeding purposes. The male tench is easily distinguishable by the larger size of the ventral fin, which, as Mr. Couch remarks, "has a stout, thick, crooked, and transversely-striated first ray." A mixture of greaves and meal is excellent food for tench which are being kept for the table; and a well-fed tench is a most worthy fish from a gastronomical point of view.

As regards his capabilities of affording sport opinions differ, but most anglers seem to agree that he is a most capricious fish. One day he will take almost any bait offered to his notice; another, and another, and another, he will ignore the angler's best worm so completely that it would seem impossible that a tench ever existed in the pond under notice. Mr. Francis mentions an example of this. He was told by the proprietor of a small pond in Hampshire

that it was full of fine tench. He fished all one evening, and got only a miserable little half-pounder, and would have given up in despair, but the owner begged him to try again next day. He did so, and was rewarded by catching so many that at last he got tired of pulling them out, and left off while the fish were yet biting freely. He went back to the pond next day, and caught *one* small tench; and, though he returned on many occasions, in hope of resuming the splendid sport he had had, he never caught a single tench there again. Though tench sometimes feed freely all day, their favourite feeding-time is dusk, when the angler can scarcely see his float. Tench, like bream, will sometimes take the bait when standing on their heads searching for food on the bottom; the angler's float then ceases to "cock," for the leads on the line hang downwards from the fish's mouth as he rises tail foremost. It behoves the fisherman, therefore, to keep his eyes open if he wishes to strike at the right moment, which authorities maintain should be only when he sees his float well carried off.

On the Norfolk Broads, besides the numbers of tench that are caught in bow-nets, there is a curious local way of catching them, which, though not so common as it used to be, is still resorted to by the Broadmen. During the hot summer days, and especially at the spawning-time, tench love to bask on the surface of the water. The approach of the fishermen in a boat disturbs them only sufficiently to make them seek the shelter of the nearest bed of reeds, to which the angler cautiously follows them. He can see where any particular fish has paused in his flight by the bubble which rises when he stops, and, lowering one hand cautiously under the fish, just behind the gills, he raises it gently, yet rapidly, out of the water and into the boat. The tench seems to think that the fingers creeping under it are only bits of weed; but the tench-tickler must be careful of two things—one is, not to touch the fish on the tail, as a violent dash away is the immediate consequence; and the other is, to be cautious, in lifting the tench into the boat, not to touch the gunwale with his knuckles, as

the slightest jar wakes the fish from its pleasant dream, and it will probably flounce out of its captor's hand and escape—a wiser, if not a sadder, fish. In the "Fauna of Norfolk," the Rev. M. Lubbock says that in the course of a favourable day, a tench-tickler "would easily secure five or six dozen;" and Mr. Davies, in his "Norfolk Broads and Rivers," mentions a fisherman at Oulton who has frequently successfully "tickled" seventeen brace of large tench in the course of a summer's afternoon. It is a pity that this interesting mode of catching tench should be on the wane, as Mr. Davies affirms it to be; bow-nets are probably one of the causes of its decline, and a continuance of cold wet summers is another, as tench are found basking near the top of the water only in very hot sunny weather, owing to their extreme sensitiveness to cold.

Bream are, like tench, fond of still, quiet waters with soft soil bottoms, in which they find their chief sustenance. Izaak Walton speaks highly of this "large and stately fish," as he calls him, a name his appearance assuredly merits.

The "Boke of St. Albans" calls him "a noble fyssche and a deynteous," and gives particular directions for catching him. Even as far back as Chaucer bream were known and appreciated, for that poet referred to them in his Prologue to the "Canterbury Tales:"—

> "Full many a fair partrich hadde he in mewe
> And many a Breme and many a Luce in stewe."

Sir William Dugdale states that in 1419, when the labour of a skilled artisan was worth less than sixpence a day, a single bream was valued at twenty pence. In the "Pictorial History of England," mention is made of a pie containing four bream, which was sent from Warwickshire to a distant part of Yorkshire, and cost sixteen shillings; a proof that these fish must have been highly valued to be thought worth sending on such a long journey.

Bream, though not so common as carp and tench, are found in most parts of England, except Cornwall and Devonshire; and in Ireland they inhabit the lakes of the north. In Lough Erne, that "fishiest" of lakes, bream

abound in such enormous shoals that they make a ripple on the water like a stiff breeze of wind. Leland, in that quaint language so peculiar to himself, says that "in Wales, not far from Breckenok, in Llyn Senatham, which is in bredth a mile, and a two miles of length, and wher as it is depest a thirteen fadom, it berith as the principale fisch a great numbre of Bremes, and they appere in May in mighti sculles. So that sumtime they breke large nets; and ons frayed appereth not in the bryme of the water that yere againe." In many places where bream abound nets are used for taking them. In Ireland this is the case, where the bream run to a very large size, attaining sometimes twelve and fourteen pounds. They are usually bought by the poorer classes, who split and salt them to eat with their potatoes in winter. In England the poorer classes are not so wise; and in Norfolk, where bream swarm, the amount of these fish formerly thrown away in heaps to rot on the banks was an absolute disgrace in a country where there is such destitution as in England. Since the passing

of the Norfolk and Suffolk Freshwater Fisheries Act in 1877 this waste has happily been put a stop to, as these immense quantities of fish were caught by poachers dragging the rivers with small-meshed nets. Most of the bream caught in Norfolk are sent to towns such as Manchester and Birmingham, where there are large numbers of poor Jews, who buy the bream at a low price for eating on fast-days. It has been affirmed by Mr. Greville Fennell, in the columns of the *Field*, that on Trent-side bream are held in high estimation for the table, and it is said that a bream weighing 17 lbs. was once taken in the Trent. The one drawback to a bream's gastronomical merit is that he is furnished with a double row of ribs, which correspond to those of the herring, shad, and pilchard. But in a fish of so large a size, it seems absurd to allow this fact to militate much against him, when herrings, whose diminutive bodies often seem to contain nothing but bones, are so highly appreciated. In France, bream are much eaten, ten or twelve sous a pound being the usual

price in country towns. The old French proverb, "Qui a brème peut bramer ses amis," which Izaak Walton translates, "He that hath breams in his pond is able to bid his friend welcome," proves that in France a bream, like good wine, "needs no bush."

But though opinions may differ in our enlightened land as to a bream's toothsomeness, all authorities agree as to his merits as a "sporting" fish. His deep sides give him immense advantages in offering resistance. Mr. Manley says of him that "he makes bold, strong, determined rushes when *first* hooked, and a young angler with anything like fine tackle will have his nerve and skill well tested in landing a four-pounder. He is a shy and timid fish, and almost as crafty as an old carp, while of all fish he is, perhaps, the most light and delicate in his biting; and the larger he is, the more tenderly does he seem to take the bait." Bream are also as sensitive to vibrations of sound as their cousins the carp, and Mr. Manley therefore advises all bream-anglers to

wear list slippers or goloshes in their punts, as no sound is more apt to scare away bream than the noise of boots on the floor of a boat or punt. Ordinary float-tackle, such as is used for roach-fishing, will be found equally serviceable for ordinary-sized bream; big bream are more usually taken on the "leger." It is well also for a bream-angler to arm himself with a stout apron and cloth, for bream are covered, much like the tench, with a thick slime, which would otherwise ruin the angler's clothes irretrievably. The necessity of a new suit of clothes for each day's bream-fishing would be apt to warp the enthusiasm of the most ardent fisher of carp-bream.

PERCH

CHAPTER V.

PERCH.

OF all British freshwater fishes the perch is perhaps the most widely distributed. In nearly all the ponds and rivers of England and Ireland he is to be found, and in some of the waters in the South of Scotland. Further north he becomes rare. It is hard to ascribe a reason for the perch's dislike to Scotland; it cannot be the cold climate, as perch are found in Scandinavia and even in Lapland.

For two reasons the perch is worth cultivation. He affords excellent sport, as all Thames, Kennet, and Waveney anglers will acknowledge; and what would riparian haunts be without the edible charms of *Perca fluviatilis*? Other charms he has, too, for he is one of the most beautiful fish in our islands. Frank Buckland says of the perch that "No lady's

dress was ever made so beautiful as that of a perch's when he is in full season. His cuirass of scales is formed of a lovely bronze, with transverse bars of dark-green bronze, while the whole is shaded with a lovely peacock iridescence. His fins are coloured with a lovely tinge of red, such as we may sometimes see in the glass of very old church windows, or occasionally in Salviati's beautiful glass. Artists would do well to study the colouring of the perch. They will not find such brilliancy of colour or such a combination of tints in any flower." Mr. Buckland might have quoted the description of the serpent in Keats' "Lamia:"—

> "She was a gordian shape of dazzling hue,
> Vermilion-spotted, golden, green, and blue;
> Striped like a zebra, freckled like a pard,
> Eyed like a peacock, and all crimson barr'd;
> And full of silver moons,"—

But this extraordinary brilliancy of colouring, bestowed on such a northerner as the British perch, is more or less evanescent. "Age *can* wither" him, and an elderly perch is a very dusky object in comparison with the "chromatic

beauty," as one writer puts it, of the rising generation.

The perch has come down to us from ancient days with a long pedigree of excellence. He was well known to the Greeks, and Aristotle wrote much about him under the name of πέρκη. In fact, his name of perch is derived from the adjective πέρκος, which was used to describe the dark shade of ripening olives, a colour which we find reproduced in the "transverse bars" that adorn *Perca fluviatilis.* These dark bars are sometimes the cause of a curious optical illusion; for, on looking down on a perch through clear still water, he appears absolutely transparent. The family of *Percidæ*, to which the perch belongs, is a very large one, distributed over all parts of the world, in salt water as well as in fresh. Amongst his cousins the perch can claim such ornaments to fish society as the stinging weever or "sea dragon," the labrax or "sea wolf," after whose name "in Latin or Greek gradus," says Mr. Manley, "is found such a string of epithets denoting his rapacity, voracity, and fierceness that they make one's very blood

run cold," the hideous "sky-gazer" of the Mediterranean, and the Nile perch, which even a crocodile is said to eschew. Of these *Acanthopteri*, or spinous-finned fishes, very few inhabit our waters, an immunity for which any one who has personally encountered a stinging weever or even handled a perch incautiously will feel grateful.

The first dorsal fin of a perch is a weapon both of offence and defence. When he is placidly enjoying himself, after he has had a satisfying meal of the small red worms which his soul loves, and which are found in abundance in the wet soil by Thames side, then the perch sheathes his back fin. Like many people of one's acquaintance, when he has everything to his liking he can afford to be good-humoured; but let something occur to upset him (and a perch's temper has not got a very firm equilibrium), and in a moment he rushes at the offender, whatever he may be, with all his spines erect and bristling, and, as a French author aptly puts it, "il fait penser au chat." As to these spines Mr. Manley quaintly

remarks, "I hardly know which is the least easy to handle with any substantial comfort, a perch, a red-hot coal, or a lively hedgehog." Appropriately was one of the old Saxon gods represented standing with naked feet on the back fin of a perch, "as an emblem of patience in adversity and constancy in trial." Pike have been said to refrain from devouring perch on account of this dorsal fin; but this has been pretty well disproved, and certainly the many deaths from "sticklebackitis" amongst young jack would seem to denote that they are often rash enough to attempt to negotiate far pricklier food than a perch. Drayton alludes to this idea when he speaks of

"The perch with pricking fins, against the pike prepared."

A pike's intelligence, however, is quite sufficient to tell him that a perch swallowed, as he always is, head-foremost, would be a comparatively innocuous morsel, for the threatening fin would be closed down, like the ribs of a furled umbrella, when passing down the gullet. Once the perch is inside, the pike knows his gastric

juices too well to have further qualms. Perhaps it is the necessity of taking good aim when proceeding to swallow a perch that makes the pike fight shy of him in his hours of repletion, for a perch swallowed sideways would certainly give trouble. In many places both in England and the south of Scotland small perch are considered the best taking bait for pike, and in Slapton Lea a perch with his back fin cut off is almost the only bait used for pike-fishing. Some writers suggest that it is on account of the unusually rough skin and closely-set scales of the perch that that all-devouring monster the pike is lenient towards him. However, it is hardly necessary to find reason for a fallacy.

Pike are often caught in Sweden in a curious way, illustrative of their greed. Large perch swallow the baited hooks on the night-lines, and in their turn are swallowed by pike. In this case, however, it is, of course, impossible for the pike to swallow the perch *head-foremost*, and, though he is not actually hooked, yet the perch's spines set so fast in his throat and

mouth that the fisherman draws both fish in together. Somewhat the same fate often overtakes the perch, too, when his greed makes him attempt to devour the formidable sticklebacks. The sharp-set spines of the back and ventral fins of the sticklebacks are driven into the membrane of the mouth of the perch, and cause "such fretting ulcerations as to lead to its destruction," as Mr. Couch remarks.

The skin of the perch is remarkably thick; and Linnæus in his "Lachesis Lapponica," gives the following account of the way by which the Laplanders convert it into glue:—

"The glue used by the Laplanders for joining the two portions of different woods of which their bows are made is prepared from the common perch in the following manner:—Some of the largest of this fish being flayed, the skins are first dried, and afterwards soaked in a small quantity of cold water, so that the scales can be rubbed off. Four or five of these skins being wrapped up together in a bladder or in a piece of birch bark, so that no water can get at them, are set on the fire in a pot of water to boil, a stone being laid over the pot to keep in the heat. The skins thus prepared make a very strong glue, insomuch that the articles joined with it will never separate again. A bandage is tied round the bow while making to hold the two parts more firmly together."

Linnæus described also a deformed variety of perch, with the back greatly elevated and the tail distorted, which he found at Fahlun, in Sweden, and in other lakes in the north of Europe. Specimens of these "deformed" perch have also been found in Llyn Raithlyn, in Merionethshire, and there is a drawing of one of them in Daniel's "Rural Sports;" but they are looked upon as "accidents of nature" rather than a true and distinct breed. Albino perch, also, almost entirely white, have been found in the waters of particular soils.

Perch prefer lakes and the deeper and less rapid pools of rivers; a very swift current is to them an abomination; and, if their lot is cast in a rapid stream, they will invariably be found near the bank or in backwaters. In the winter-time, when floods occur, perch are driven in vast numbers into any pool or eddy they can find, and it is then that the largest "takes" are made. Mr. Francis says that on these occasions "they are pulled out not in braces, dozens, or even scores, but often to the tune of hundreds. I have seen and helped to catch ten dozen, and

over, out of one hole, and have heard of twice ten dozen being taken." It is at starvation times such as those that the perch merits his name of "the greedy perch, bold biting fool," as the Complimentary Ode to Izaak Walton has it; but at less rigorous seasons, and when he is not over plentiful, there are few fish more intelligently wary than he. Indeed in waters that are much fished perch attain an experience of bait and fishing-tackle which would do credit to many anglers, who often insult a perch's intelligence by fishing for him with a monstrous apparatus of hog's bristles, shots, and bone bought at a tackle-maker's, under the fond delusion that it is the "right sort" of paternoster. As Mr. Francis rightly observes about such abominations, "if he (the perch) condescends to take your minnow at all, he will take it probably *without* the hook."

There are several ways of fishing for perch, but paternostering from a punt is the most common and the most successful as to mere numbers. The largest and best fish, however, are more apt to take a spinning minnow; and

in lakes they are said to take a spoon better than almost any other spinning bait. In this matter of spoons they have their predilections; and it is said they prefer the triangular spinner made of spoon-metal (commonly known as the "otter") to the ordinary spoon. In some parts of the country perch are fished for with a fly; and, as they are not particular about the fashion of the fly, a showy one, with plenty of tinsel on the body, is most to be commended. In Norfolk, the water-shrimp is a favourite bait. One thing, however, that the angler should be careful to remember is that the perch has a rather tender mouth, and therefore needs delicate handling. He should neither be struck at too sharply nor played too roughly.

Ponds in which perch are bred and kept for table should be carefully netted from time to time; perch breed so fast that if care is not taken to keep their numbers within bounds, they will soon overstock a pond. Mutual starvation is the result, and the owner is surprised to find that his perch are rapidly degenerating and becoming very small. The remedy for this

state of things is to keep down the numbers, and to feed the survivors regularly; under these favourable circumstances the perch will grow and fatten rapidly. Perch vary in weight considerably according to the locality. On the Thames a perch of 4 lbs. or $4\frac{1}{2}$ lbs. is looked upon as a monster and a rarity; and even a 2-lb. fish is considered a very satisfactory specimen. But at Slapton Lea one was taken who weighed 6 lbs., his portrait and a record of his weight being figured in chalk on the wall of the bar-parlour. Another of the same weight was caught in the Birmingham Canal. Montagu mentions a perch of 8 lbs. he saw taken in the Avon on a night-line which had been set for pike, and another eight-pounder was caught in Dagenham Breach. In the Norfolk Broads perch are both numerous and large. Mr. Davies says that "four-pounders are frequently taken, and the Waveney produces some very large ones. A 7-lb. perch was taken some years ago out of the new cut from Reedham to Maddiscoe, and others from five to six pounds in weight have been taken in the Bure

and on Ormesby Broad." Pennant speaks of a perch, taken in the Serpentine, Hyde Park, that weighed 9 lbs. In Scandinavia and Lapland the perch attains a still larger size, and Bloch speaks of the head of a perch preserved in the church of Luelah, in Lapland, which measured twelve inches from the point of the nose to the end of the gill-cover. Mr. Frank Buckland was not lucky enough to get hold of any of these perchy monsters, for the largest that came into his hands was one sent to him by Dr. Norman from Norfolk in 1868; it weighed 3 lbs. 2 ozs.

The quantity of ova varies very much in perch, but all authorities are agreed that it is very large. In one perch, of half a pound weight, 280,000 eggs were found, whereas in the Norfolk perch just mentioned Mr. Buckland found only 155,620, in spite of the greater size of the fish.

The fact that perch have a most remarkable capacity for living out of water for a considerable period, should add greatly to their value as a marketable commodity. Thus, in some

parts of Germany perch are caught and carried alive to market, sometimes a distance of forty or fifty miles, and, if not sold, brought back to their pond.

Few better fish come to table than a good river-perch. Amongst the ancients he was held in high favour. Ausonius sang his praises, and thus addressed him :—

"Nec te, *delicias mensarum*, Perca, silebo."

Galen prescribed perch as good for invalids, and another author spoke rapturously of the fish's "flower-like" odour. Walton, speaking of his merits, quotes the proverb, "More wholesome than a perch of Rhine." Mr. Frank Buckland speaks of them as being used for "water-souché," a dish beloved by most riparians, but pins his own faith to perch cooked by the fisherman as soon as caught, for which he gives the following "excellent receipt :"—

"Take the fish as caught, not drawn or otherwise cleaned, procure some stiff clay, and with it give the fish a thin coating about the sixteenth of an inch thick; failing the clay, lightly envelop it in several coatings of paper—newspaper will answer admirably; thoroughly

saturate the paper by holding it in hot water, having previously lighted a fire of wood and sticks so as to produce a quantity of hot fire-holding embers. Give the fish in the case of clay twenty minutes therein ; if the fish are in newspaper give them twenty minutes longer ; time must be allowed according to size. Fish done in this way are perfection."

No doubt they are ; and a hungry fisherman's appetite will probably supply the best sauce for this worthy fish.

SMALL FRY

CHAPTER VI.

SMALL FRY.

I.

ICHAEL DRAYTON hardly showed his usual discrimination when he treated small fry so cavalierly in his lines:—

"The dainty gudgeon, loche, the minnow, and the bleak,
Since they but little are, I little need to speak."

Only too many people have followed in his footsteps, and of such we can but say with all commiseration theirs is the loss. The initiated wisely place very high the merits of a dish of fat gudgeon, fried piping hot, and "asperged" with lemon juice. Unfortunately for the general public, gudgeon do not come much into the market. Perhaps the conscious superiority of having partaken of this "dish for kings" is one of the reasons for the divine placidity of mind of a Thames angler; for, as old Father Izaak

testifies, "I envy not him that eats better meat than I do, nor him that is richer, or that wears better clothes than I do; I envy nobody but him, and him only, that catches more fish than I do."

That gudgeon-fishing is an all-absorbing pastime is proved by many stories, the best of all being that told by Daniel, in his "Rural Sports," of an angling vicar, who was engaged to be married to his bishop's daughter. To raise his spirits, we suppose, upon "the fatal morn" he went out gudgeon-fishing, and lingered so long over his sport that, when he at last arrived at the church, it was too late for the ceremony, and the bride contemptuously declined to marry a man who so evidently preferred the quiet flow of a gudgeon stream to the more stormy waters of matrimony, or, in other words, "his basket to his bride." No doubt the consciousness of twelve dozen fish in his basket sustained him under such an ordeal. Sir Isaac Newton was not proof against this one "touch of nature," and Bacon, Cecil, Holinshed, and Gay all helped to swell the noble army of gudgeon-fishers.

The Greeks called the gudgeon κωβιός, from which came the Latin *gobius* or *gobio.* Some authorities, such as Linnæus, Bloch, Donovan, and Jenyns, consider him a true member of the carp family, and therefore call him *Cyprinus Gobio*, while Johnston, Willoughby, Fleming, Yarrell, and Couch differ from their learned brethren, and, though allowing that the little barbels at the gudgeon's mouth cause a resemblance to the mighty carp, they maintain that the difference of the dorsal and anal fins being short in the gudgeon, and, above all, in his not possessing the spines in front of those fins, which are a distinguishing mark of the true *Cyprinidæ*, precludes the idea of a very close relationship. By these authorities, therefore, this lovely little fish is simply called *Gobio fluviatilis*, on account of his preference for running water. Alluding to this very spinelessness (which causes his non-resemblance to the carp family) and the general slipperiness of the gudgeon's little person, Ovid says of him,—

"Lubricus et spinâ nocuus non gobius ullâ."

Dr. Badham, in his "Fishing Tattle" relates the story of the dish of gudgeon which Ptolemy caused to be set before the parasite Archephon, whom he had invited over from Attica to Egypt. Ptolemy was utterly taken aback when his guest refused the delicacy, and he muttered to his confidant Alcanor that the guest must be either a blind man or a lunatic. Alcanor hastened to appease the royal wrath by attributing the guest's abstinence to modesty. "He saw it, sire, but deemed himself unworthy to lay profane hands upon so divine a little fish."

Galen gives the gudgeon a high place amongst edible fish, not only for the sweetness and delicacy of its flavour, but also for its digestibility. John Williamson, "gent. temp. 1740," commends the gudgeon "for a fish of an excellent nourishment, easy of digestion, and increasing good blood." Izaak Walton says "the gudgeon is reputed a fish of excellent taste and to be very wholesome." Dr. Brookes, in his "History of Fishes," goes still further, and says that this fish is "thought good for a consumption *and by*

many swallowed alive." Whether this belief has scientific sanction is not added; but it is on record that Mdme. de Genlis, one day out fishing with some companions, on being accused by them of being a "fine Paris lady," suddenly seized a freshly-caught gudgeon, and swallowed it alive, exclaiming, "This will show whether I am a fine Paris lady!" We can only hope that her friends were sufficiently convinced.

Gudgeon are pretty widely distributed over Europe; and in most of the rivers of England and Ireland are found in abundance. In Scotland it is not known, and only of recent years has it been found in Cornwall or the western portion of Devonshire. In France it is immensely esteemed for the table, two francs and upwards a pound being given for it in the country towns. Mr. Manley says that Thames fishermen can always get for gudgeon a halfpenny apiece at the waterside hotels on the Upper Thames, where the experience of riparians has taught them to appreciate the edible charms of *gobio*. The best gudgeon for eating are

certainly those of the Thames, which far surpass in flavour those of the Trent and the two Avons, where they are found in abundance.

Gudgeon like clear, moderately swift-flowing rivers, with bottoms of gravel, and here and there deep holes in which they congregate in the winter for warmth. Mr. Frank Buckland, who was an ardent admirer of gudgeon-fishing, says that "favourite spots for them when in the biting humour about Windsor, are the deep holes dredged out of the bed of the Thames by the dredging locally called ballast, barges." However, a gudgeon is a hardy little fish, and few situations come amiss to him. He does well in ponds, especially if a stream happens to run through. Couch, writing some half-century ago, specifies ponds near Penzance where throve gudgeon remarkably well.

Gudgeon are marvellously prolific, as may well be imagined when anglers sometimes take twelve dozen in a day, and often take seven or eight dozen. These little fish spawn three times a year, beginning in April; and French authorities say they require a month to hatch out, an

opinion not altogether shared at this side of the Channel. Unlike many other fish, amongst whom polyandry seems to be the order of existence, the gudgeon is a true Mormon, and has at least six wives, if not more. By the beginning of August the fry are about an inch long. The best months for gudgeon-fishing are August, September, October, and even as late as November. Owing to the different times of spawning, the angler will probably find among his take an extraordinary difference of size, some fishes being quite large and others extremely small. The Thames Angling Preservation Society tells its members not to take, or rather not to keep, gudgeon measuring more than five inches from the eye to the end of the tail; but it is more than doubtful whether any one ever attends to this prohibition. Gudgeon have been known to attain seven inches, and even perhaps eight, but these *gobios* are monsters, and worthy to be placed in glass cases. The ordinary size for a gudgeon is between five and six inches, and a Thames fisherman is hardly likely to throw back into the water a gudgeon under five inches,

which would make about the very best possible bait for either perch or eels.

Though a gudgeon is good enough to be proof against being spoiled by even an amateur cook, opinions differ somewhat as to the best ways of treating him. Frank Buckland earnestly recommends: "When out gudgeon-fishing on the Thames, be sure and take a frying-pan, as gudgeons taken out of the water and immediately fried are delicious. Clean, wipe, and flour, then well fry in boiling fat, or better, in oil, till they are crisp and of a light-brown colour. Such a fish-dinner is always a great feature in a picnic on a fine day." Mr. Manley, who, though he abuses all other fresh-water fish from a culinary point of view, is enthusiastic over fried gudgeon, says that "the chief secret, as with the cooking of all coarse fresh-water fish, is to allow the gudgeon, after being cleaned, to become dry and almost hard by exposure to sun and wind." In France gudgeon are simply fried in butter after having been well washed externally, though not cleaned out. But, though opinions may differ as to

details, all are agreed that the gudgeon is fat and well liking, "præpinguis, teres," as Ausonius remarks, and worthy to appear on the table of the most epicurean of *gourmets.*

The loach is another member of the tribe of small fry who is worthy of more notice than he generally gets. He is a tiny little fish, rarely attaining five inches in length, and he somewhat resembles a small gudgeon, though his barred tail and mottled sides make him richer in colour and better looking. The loach is even more slippery a customer than the gudgeon, on account of his very small scales, which not only offer no resistance to the touch, but are also covered with a slimy secretion. He lives almost entirely at the bottom of the stream, where he finds the worms and aquatic insects that form his food, and where he usually lies concealed behind or beneath a stone waiting for his prey. The loach never uses his eyes for the purpose of seeking his prey; the barbs encircling his mouth are possessed of nerves far more developed and of higher sensibility than those that provide his eyes with sight, and

they help him to his prey far better than mere sight could. The nerves of both the organ of hearing and that of smell are of most acute sensibility, and experiments have proved that a loach will follow its food by the scent, so as to discover it, even when hidden from sight or touch. Loaches are nocturnal fish, which is probably the reason why their sight is less developed than their other senses; as soon as darkness comes on they become extremely active, in contrast to their utter listlessness by day.

However, in spite of this listlessness, they will take a bait, and Izaak Walton, who speaks of the loach as "a most dainty dish . . . . very grateful both to the palate and stomach of sick persons," recommends that he should be "fished for with a very small worm, at the bottom, for he very seldom or never rises above the gravel."

In some parts of Europe loach are immensely esteemed for the table, and great trouble is taken to transport them to market alive. In connection with this, Couch mentions an unpleasant habit said to obtain in some parts of

England of swallowing loach alive; but, as he wisely adds, "When this sort of mistaken craving is indulged in, the devourer should at least be cautioned to observe the advice of Rondeletius, in not mistaking the armed loach for the smooth-cheeked species, and thereby become liable to the penalty of suffering a laceration of his throat, as the struggling victim may be urging his passage into his stomach."

Linnæus, in his "Fauna Suecica," records the fact that Frederick I., King of Sweden, had loach brought over from Germany, and naturalized in Sweden. Gesner, that drawer of the long-bow in all matters piscatorial, for once was right when he spoke highly of the loach's edible qualities, and recommended him as a good dish for invalids. It seems a pity that so excellent a little fish, a worthy substitute for whitebait, should not be cultivated for the table, to the advantage of all fish-eaters.

From a sporting point of view, the loach, unlike his relation the brave little gudgeon, has but little to recommend him. The most ordinary way in which his capture is effected is

by small boys armed with dinner-forks tied to the end of sticks, with which they spear poor little "Beardie," while, like an ostrich, he has hidden his head behind a stone. But if he does not show sport himself, he is capable of causing it to be shown by others, for loach are one of the most deadly baits for lake trout that can be found. And to such persons as wish to try what delights loach-trolling can afford on an Irish lough, on a fine summer or autumn evening, we would recommend the use of the small green loach, of about two and a half to three inches long, as being of the kind and size most preferred by *Salmo ferox*.

II.

Next to the gudgeon in the order of edible merit comes the minnow. Though the smallest member of the *Cyprinidæ*, he is by no means to be despised on that account. Izaak Walton, speaking of the minnow, says that he may be

"for excellency of meat, compared to any fish of greatest value and largest size." Mr. Yarrell says, "they make an excellent fry when a sufficient quantity can be obtained," which is a wise proviso as regards so diminutive a little person as *Leuciscus phoxinus*. By this name he is spoken of by Cuvier, Fleming, and Yarrell; Linnæus and Jenyns call him *Cyprinus phoxinus;* and Johnston varies the cognomen still further in *Phoxinus lævis*, the latter word being derived from the Greek φοξός, a term which the minnow shares with Thersites, who in the "Iliad" has his head alluded to thereby. Rondeletius spoke of the minnow as *Varius;* and Aristotle, who made many observations on minnows and their habits, always alludes to this little fish as *Phoxinus*, owing to its shape, which he considered was "formed like a top," though why a minnow should be thought more like a top in shape than other fishes—the salmon, for instance, whose shape he reproduces in miniature—it would be hard to say.

Top-shaped or not, the minnow is one of the greatest dandies the British rivers possess,

especially when he goes courting in the summer time. His back is dark green, ornamented with bars of a yet darker shade, a yellow line adorns his sides from his gill-covers to his tail; his cheeks and fins are yellow; underneath he is a brilliant pink during the summer, and at other times a faint yellow. As all this variety of colour is united on a little body barely three inches long, it is easy to imagine what an ornamental little fish the *Leuciscus phoxinus* is.

The minnow is very different from the gudgeon in his choice of water, for while the gudgeon has an unpleasant liking for sewer water, the minnow is most particular that the water he lives in should be clear and rapid. The water of the Itchen, which runs past Winchester, and is largely mixed with chalk, is particularly favourable to minnows; and the Itchen minnows are said to be unusually large and handsome. It was perhaps owing to their being so that William of Wykeham, the founder of Winchester College, was so very partial to them, and had them constantly served at his

table. At a banquet which he gave to the King and Queen on the 16th of September, 1394, many kinds of fish were served, and amongst them no less than seven gallons of minnows, which cost eleven shillings and eightpence. At this banquet two hundred and ten guests were present, and the dinner cost 385*l.* of our present money. People in those days were more enlightened as to the merits of fresh-water fish than they are now, when a fishmonger would open his eyes with astonishment, not unmingled with contempt, if any daring mortal should express a wish for a dish of gudgeon or minnows.

As a rule, minnows are very clean feeders, living chiefly on aquatic vegetables, and also on tiny insects and worms or other soft bodies. Some authorities say they are very destructive to the spawn of salmon and of trout; but this statement is open to doubt. Rather is it the other way; for, though the minnow has many enemies, it is a question whether any of them devour as many minnows as do the salmon and trout. From the time he first makes his

appearance the minnow's life is a hand-to-hand struggle for existence. All fish are ready to eat him, and even his eggs become the prey of many enemies, especially eels, ducks, and shore-rats, who watch the minnows during the spawning season, and, if possible, devour all the eggs. If minnows were not so remarkably prolific, they would have become extinct long ago; but, as Aristotle remarked, minnows begin to breed almost as soon as they come into existence. The spawning season, which is in the middle of summer, is a very short one, and the great increase of minnows would therefore seem at first a mystery; but the same observer, Aristotle, discovered that "the younger fishes produce a progeny sufficient to provide a second growth before the expiration of the same season."

A writer in "Loudon's Magazine of Natural History" in May, 1832, described his own observations on the spawning of minnows, which were most curious, as follows:—

"I was astonished to find how quickly the eggs were hatched. I discovered a large shoal spawning on the 11th

of May; on the 12th they were diminished to one-tenth of the number, and on the 14th there was not one left. As I had by no means satisfied myself on the subject, I felt disappointed that they had so soon finished their operations, and I took up a handful of the gravel where they had been spawning, and examined it with the microscope to see whether I could discover any eggs and how they were going on, when, to my great surprise, I found them hatching, and some of them already excluded from the egg. One of them which I took on the point of a knife swam briskly away, and another was the means of pointing out an enemy to me that I had never before suspected, and that I had always believed to be the prey and not the devourer of fish. The poor minnow had somehow got fast to the point of the knife, and in its struggles to free itself it attracted the attention of a creeper (the larva, I believe of the fly called the green drake by anglers), which pounced upon it as fiercely as the water staphylinus does upon the luckless tadpole; but, fortunately for the minnow, either the glittering of the knife-blade or the motion of my hand scared it away again without its prey. The young minnows in this state were quite transparent, except the eyes, which appeared disproportionately large; and they seemed to be perfectly aware that they owed their safety to concealment, as those that I saw immediately buried themselves in the gravel when they were set at liberty."

During the spawning season the heads of the minnows are covered with small white osseous knobs, which appear immediately before, and

vanish immediately after, the fish have spawned. These are generally supposed to be meant as a protection to the head of the fish during spawning, when they jam their heads in between two pebbles, while their tails stand up almost perpendicularly. In the Report of the Imperial Society of Acclimatization in 1867 there is a most interesting paper by M. Saubadon on the minnow, which he bred in great quantities as food for trout and young salmon. Besides breeding them artificially, M. Saubadon used also to search the spawning-beds of the minnows (which he remarked were always on the same piece of ground) and collect the eggs, which are very small, and are to be found adhering one to the other, in the interstices of the stones. Sometimes he found masses of eggs two inches in width and eight inches in length, and on one occasion he collected more than *six pounds' weight* of minnows' eggs. *De minimis non curat lex*, so we suppose there is no law against robbing the nest of a minnow.

Amongst minnows the average of the sexes is two males to one female. Besides feeding on

worms and aquatic plants, minnows have also a habit of cannibalism, and devour the dead bodies of their own kind. In a letter to his friend, the Rev. Mr. Hurdis, dated from Weston, in February, 1793, Cowper gives an interesting account of this intelligent habit of the minnows of disposing of their dead relations :—

"Mrs. Unwin and I crossing a brook saw, from the footbridge, somewhat at the bottom of the water which had the appearance of a flower. Observing it attentively, we found that it consisted of a circular assemblage of minnows ; their heads all met in the centre, and their tails diverging at equal distances, and being elevated above their heads, gave them the appearance of a flower half blown. One was longer than the rest ; and as often as a straggler came in sight, he quitted his place to pursue him, and, having driven him away, he returned to it again, no other minnow offering to take it in his absence. This we saw him do several times. The object that had attracted them all was a dead minnow, which they seemed to be devouring."

A minnow, though a very shy and timid fish, as he well may be when, like Ishmael, he finds every one's hand (or jaws) against him, will readily take a bait. Mr. Manley recommends that he should be fished for in about two or three feet of water, with "a scrap of worm or gentle

on a very small hook, or even without a hook, and touching the bottom," for a minnow when he seizes a bait will hold it so fast with his jaws that he may be thus lifted out of the water, hook or no hook. It is only very youthful anglers, however, as a rule, who go minnow-fishing with a rod and line: the more usual manner of capture is a "minnow-net," which Frank Buckland took great pains to describe:—

"A fine-meshed net is fastened nearly flat to an iron hoop about two feet in diameter; in the middle is fastened a perforated bullet and a piece of red cloth; three strings run off from the ring and join together about two feet away from the hoop; a longer line is attached to this and also to a pole, say eight feet long. The net is dropped into the river, the minnows are attracted by the red cloth, and the net is raised quickly by means of the pole."

Mr. Buckland forgot to add a necessary piece of advice—that the net should be drawn up at intervals of a quarter of a minute or so, so as not to give such active little fish as the minnows time to dash away after satisfying their curiosity anent the red cloth. The natural inquisitiveness of a minnow often leads to his ruin, as he finds when he is tempted to enter one of the glass

bottles often used as traps to capture him. These traps are large glass jars with perforated metal tops, and the bottom made like the mouth of a lobster-pot.

Minnows are most interesting little fish to have in a fresh-water aquarium, and it is quite surprising how tame they will become, even to taking food from the hand of their keeper and attending on all his movements.

There are several ways of cooking these tiny *Cyprinidæ*. The most ordinary method, and perhaps the best, is to treat them like whitebait, "for which," says Mr. Manley from experience, "they are an excellent substitute," and it is thus *en frîture* that they are usually eaten in France. Some connoisseurs pickle them, and pronounce them a most savoury breakfast dish; while Father Izaak quaintly recommends that "their heads and tails being cut off, and their guts taken out, and not washt after, they prove excellent for that use, that is, being fryed with yolks of eggs, the flowers of cowslips, and of primroses, and a little Tansie; thus used they make a dainty dish of meat."

FISH-PONDS

CHAPTER VIII.

FISH-PONDS.

I.

FISH-PONDS, as well as their usual inhabitants, the so-called "coarse fish," take high rank among the undeveloped possibilities of this country. By fish-ponds, we do not mean a tank at the end of the garden, in which a few plethoric members of the finny tribes eke out a somnolent existence; but ponds established on a sound system, with a business eye directed to the profits they will surely return to their proprietor.

We who have the good fortune (or otherwise) of living in these palmy days of the nineteenth century, surrounded by scientific developments of all kinds, are rather inclined to look back with scorn at the amount of knowledge possessed

by the poor creatures who lived in what we are pleased to call the "Dark Ages." But there are just a few things in which it must be owned these poor creatures can yet teach us a good deal, and one of those things is a fish-pond. In the times when, on the one hand, sea-fish were, practically speaking, unattainable, and on the other, fish of some kind were an absolute necessity for the fast-days every one observed, it behoved many people to study the question of the supply of fresh-water fish.

The establishment of fish-stews and ponds was the natural result of the existing order of things. No abbey or nunnery was without its stews in which the fish were kept and fattened for the table; and most of the great country-houses were equally well supplied. In many places where these ancient ponds and stews still exist they might be brought into working order again with very little trouble; and it is almost superfluous to speak of the hundreds of narrow valleys and glens, now barren and unused, which would make ideal sites for fish-ponds. No one who has ever been to Rome can forget

the elaborate fish-stew in the Palace of the Cæsars on the Palatine, from which the water could be drawn off at will by means of sluices. The Romans were too fond of the pleasures of the table to overlook the gastronomical merits of carefully fattened fish.

But without going back so far in the history of fish-ponds, we find almost the greatest authority on fish-culture in the person of the good bishop Dubravius, of Olmütz, in Moravia, who lived in the sixteenth century. Of this dignitary the late Frank Buckland said that:—"Bishop or no bishop, he knew more about fish-ponds than we do at the present day." He published a Latin book in black-letter, entitled "Dubravius de Piscinis," which is now extremely rare, and of which there is a copy in the Bodleian Library at Oxford. The title-page runs thus:—"Jani Dubravii, qui postea Olomucensis Episcopus creatus est, de Piscinis et Piscibus, qui in eis aluntur, naturis libri quinque, vi doctissimi, ita ad rem familiarem augendam utilissimi, ad illustrem virum Antonium Fuggerum. 1559."

Into the subject of fish-ponds the Bishop goes

with great detail, and his advice is as useful in the nineteenth century as it was in the sixteenth. The chief thing he lays stress upon is that, as he says, "a crop of fish should alternate with a crop of vegetables," or, in other words, that every pond in turn should be run dry, and planted with a crop of some kind of grain before it is again filled and re-stocked. From this point of view, he looks with favour on the "three-pond" system :—

"Suppose three ponds to be in existence, A, B, and C. Let the water be run off from pond A completely, and as it empties catch the fish and place them in pond B. Having let A run completely dry, plant the mud with oats, barley, cabbages, or rye-grass. The crops having been in due time reaped, refill it in the winter, and stock it with fry. Then dry and plant B. At the same time dispose of all the larger marketable fish, and put the half and three-parts grown fish into pond C, which now, for the first time, is taken into the regular round of cultivation. Thus with three ponds worked upon this system, the proprietor will always have a crop of vegetables growing in one pond, yearling fry in another pond, and breeders, with the fish fattening for the market, in the third."

No system that has ever been invented is better than this. Those who adopt it avoid

one of the greatest difficulties as well as one of the heaviest expenses involved by the clearing out, or, as it is technically called, "mudding," of ponds, and the necessary turning up of the mud soil by the plough ensures the fattening of the fish when they are placed in it the following year. No good breeding can be carried on in ponds unless they are drained dry from time to time; and authorities are agreed that the oftener this draining is done the better for the fish. If ponds are left to themselves and never drained out, not only will the fish not thrive in them, but they will almost cease to breed, no matter how much attention they receive. But, if the pond is run dry and left in that state, even without planting of any kind, the fish when again turned in will thrive marvellously. However, by the simple device of planting, not only is the waste ground of the pond utilized, but the crops grown therein are found to be unusually heavy, especially when oats are sown, which flourish in the mud soil. Barley also grows well in the mud, and is particularly good for the fish that come after it when the pond is

refilled. Another excellent reason for drying, ploughing, and planting ponds from time to time is that it is one of the few efficacious ways of getting rid of that aquatic plague, the American weed, which is one of the greatest nuisances of fish-ponds in this country as well as of the rivers. As a rule, the process of drying and ploughing will be found a sufficiently drastic remedy for this pest; but if it is in any very great quantity, it is well to make assurance doubly sure by a dose of common salt also.

Fishponds should not be made too deep. With the exception of a few deep holes, to which the fish like to retire at times, the best fish-ponds are generally shallow. In comparatively shallow ponds fish find a greater quantity of the insects and larvæ, on which they love to feed, than they do in deep waters, and many of the aquatic plants which they prefer—such as those of the Ranunculus and Potamegeton tribes—do better in water that is not too deep. Rushes and weeds should also be encouraged in fish-ponds, as the fish like them, not only for shelter, but chiefly for depositing their eggs

thereupon in spawning-time. Some authorities recommend that osiers should be planted round the ponds; but on this question, and also on another closely allied to it—namely, whether trees should be allowed on the margin of fish-ponds—there are considerable differences of opinion.

Izaak Walton, quoting from Dr. Lebault's "Maison Rustique," says that "if many trees be growing about your pond, the leaves thereof falling into the water make it nauseous to the fish, and the fish to be so to the eater of it." Others, on the contrary, recommend that trees should be encouraged on account of the insects that abound on their leaves and branches, caterpillars and suchlike being dainty morsels to the palates of fish. The late Frank Buckland did not give an opinion on the knotty point of trees or no trees, but contented himself by recommending that any dead leaves likely to fall, or to be blown, into the pond should be collected and burnt, as they are apt to make too much mud in the water. As regards the feeding of fish, he recommends particularly

"that a dead cat or rabbit, unskinned, should be hung up in a tree over the pond. The gentles resulting from the blow-flies will fall into the pond and afford excellent food for the fish. Care should also be taken to collect after a shower at night, by the aid of a lantern, the large lobworms that are then plentiful."

One very curious fact recorded by Mr. Buckland is that the presence of ducks on a pond is an immense advantage to the fish, which he explains by the fact that the habit which ducks have of "rootling" with their bills in the mud enables the fish to get at a quantity of minute insects, while the loosening of the mud "gives facilities to the water creatures to breed." So distinct is the improvement of the fish under these circumstances that Mr. Port, who had charge of the experimental ponds at Reculver, told Mr. Buckland that when handling eels even in the dark he could tell from their size whether they came from a stream of which ducks and geese had the run. Of course both ducks and geese must be kept away from ponds when the fish are spawning,

as they will, if allowed, devour immense quantities of fish-eggs. In a book published in 1713, called "A Discourse of Fish and Fish-ponds," by the Honourable Roger North, it is advised that cattle should be allowed to come and drink and stand in fish-ponds, "as it conduces much to the thrift of the cattle as well as the feed of the fish," the disturbance of the mud, and the consequent increase of fish food, being evidently the object in view.

The time of draining is another question much discussed. In the Limousin, the carp-breeding ponds are drained in turn every three years, in the month of October. In Germany, also, ponds are drained every third year. In some parts of Austria the fish-ponds are drained every two years. Mr. North says, "you may let your ponds stand full two or three years, not longer, unless you delight to see starved, lean fish. The oftener the ponds are laid dry the better the feed of fish shall be." Captain Milton P. Peirce, who has made fish-ponds, and everything appertaining to them, the object of his great study, emphatically declares that

"carp-ponds should be drained every spring as early as the weather will permit . . . if the ponds are not drained early in the season, the growth of aquatic vegetation will be retarded. . . . The ponds should again be drained in October for the purpose of assorting the carp, removing the young from the stock-ponds to the nursery-ponds, selecting both young and mature fish for marketing purposes, and also to destroy all enemies or other fish found in the ponds, which should be done as well as at the spring draining. Neither the ponds nor the fish should be disturbed at any other season of the year." Captain Peirce does not advocate the planting system of Dubravius, though he also recommends the use of three ponds, which he utilizes all at the same time for fish. In the "hatching-pond" he places only the finest adult specimens, in the "nursery" the young ones of both sexes indiscriminately; for, as Izaak Walton says, "in a nurse-pond, or feeding-pond in which they will not breed, then no care is to be taken, whether there be most male or female carps," and in the "stock-pond" the fish that

are ready for the market. Of the "ordering of fish-ponds," as "The Complete Angler" would say, and their construction we have more to add.

II.

Not only should fish-ponds not be too deep, but, if possible (that is to say, if they are being made artificially), they should not be too large. Large fish-ponds have many disadvantages. The uncovering of large quantities of fish when a pond is being drained is highly undesirable, and is often attended with loss; also, if the surface of water is too large, unless it is unusually well sheltered, the wind is apt to raise waves, which wash over the banks, and otherwise disturb the fish. Pond-fish are generally placid creatures, to whom rough waters are no delight; and it will be found, as a rule, that fish in well-sheltered ponds do better than those in ponds of exposed situations.

The question of whether a stream should be allowed to flow direct through fish-ponds is one which has never been satisfactorily settled, some pisciculturists being in favour of a stream, on the grounds that it freshens the pond and brings additional food to the fish, others thinking that it only disturbs them, besides being open to grave objections at flood-times. Captain Salvin, a friend of the late Frank Buckland, gave him a most interesting account of a set of fish-ponds made during the reign of Queen Anne, by Captain Salvin's great-grandfather. These three ponds are fed by a stream "which is not allowed to run through them, but is let in by sluices at pleasure. The stream is conveyed by an artificial watercourse outside, which is clearly a wise precaution against their filling up with sediment during floods, thus preventing an awful amount of trouble and expense hereafter." These ponds of Captain Salvin's are remarkable for having been almost if not *the* first to possess what is now termed a "collector," which he thus describes:—

"The deepest part of the little pond (No. 1, the fatten-

ing or stew-pond) is at the sluice, where it is emptied into No. 2, near which is a strong, square, wooden box, say four feet deep by five square, and this is sunk flush with the bottom of the pond, having two posts let in on each side at the middle of each end of the box. To these posts are fixed the ordinary gear of a draw-well, the chain being, I think, divided to hook upon rings on the sides of an inner box, which has holes at the bottom. When the fish are required the sluice is opened, and the fish of course retire into the deepest water, which is the inner box. The box is then wound up, fish and all; this is easily done, since the water runs out through the holes in the bottom."

This plan of collectors is found to be almost a necessity in fish-ponds; but we incline to think it is best to make the outer collector of masonry or concrete, instead of wood like the inner box, in which the fish are "wound up." In the Limousin, where the carp-breeding, which is most extensive, is carried on in very large natural lakes or ponds, without any collector, one of the chief outlays of money is for the numbers of men required to catch the fish in the mud, an expense which is minimized by the presence of a collector. Besides their usefulness at the draining-time, the collectors are much liked by the fish as "hides." All ponds, as we have already

said, require some deep holes into which the fish like to retire for either meditation or warmth, and collectors serve this purpose admirably.

In the edition of 1760 of "The Complete Angler" there is a curious quotation from Bowlker, who was a great authority on fish-ponds, in which he recommends :—

"When you intend to stock a pool with carp or tench, make a close ethering hedge across the head of the pool about a yard distance of the dam, and about three foot above the water, which is the best refuge for them I know of, and the only method to preserve pool-fish ; because, if any one attempts to rob the pool, muddies the water, or disturbs it with nets, most of the fish, if not all, immediately fly between the hedge and the dam, to preserve themselves ; and in all pools where there are such shelters and shades the fish delight to swim backwards and forwards, through and round the same, rubbing and sporting themselves therewith. This hedge ought to be made chiefly of orls, and not too close, the boughs long, and straggling towards the dam, by which means you may feed and fatten them as you please."

This hedge, in fact, served as a sort of collector for the fish, and in the absence of any better kind must have been very useful.

Another thing which will be found a great advantage in the adult pond is a fattening tank,

which can be conveniently placed in one corner. In it should be kept a small number of fish ready for the table or for sale; being in the fattening tank, they are caught without trouble, and no disturbance is caused to the other fish in the pond itself. As Mr. Buckland said truly, "It must be remembered that the more you feed your fish in ponds the quicker they will grow, and the larger they will become," and no pond of fish will really be turned to the most advantage unless artificial feeding is resorted to.

One curious receipt used by the monks of old for fattening carp in ponds runs as follows:—

"Barley meal, half a gallon; chalk, in powder, 1½ lbs. (very clean); clay, a sufficient quantity to make a stiff paste. Place this in the stew or pond, in a net (of not too small meshes), suspended about a foot from the bottom. When all is sucked away but the clay, put fresh in the net or nets."

How the fish are to abstract the barley and chalk out of the paste and leave the clay, is not explained. Dr. Lebault, according to Father Izaak, recommended "that you often feed your

fish by throwing in to them chippings of bread, curds, grains, or the entrails of chickens, or of any fowl or beast that you kill to feed yourselves; for these afford fish a great relief." Also "that clods of grass thrown into any pond feed any carps in summer; and that garden-earth and parsley thrown into a pond recovers and refreshes the sick fish." Bowlker advises "bullock's brains and lob-worms chopped together, and thrown into the pool in large quantities about two hours before sunset, summer and winter. . . . Wheaten bread is the best food for them, though barley or oaten bread is very good."

Herr Fruwirth, the Austrian pisciculturist, has adopted a most ingenious plan for the production of food for his fish-ponds. He has a number of small ponds or ditches with stagnant water and aquatic plants, that are used as nurseries to propagate the larvæ of insects, small crustaceans, and other low forms of animal life on which fish naturally feed. From time to time some of the water swarming with these creatures is admitted to adjoining ponds of pure

water in which the fish live, who no doubt give the new arrivals a warm welcome. One of the greatest difficulties of coarse-fish breeding is that of feeding the young fry. Mr. R. B. Marston explains this difficulty in a very simple manner.

"The umbilical sac," he says, "on the contents of which the trout alevin exists for six weeks, lasts the alevin of the coarse fish but a day or two, and unless the young fish are fed they will die, hence the difficulty of rearing them in confinement. Dr. Kelson, of Oxford, last year made the valuable discovery that the animalculæ bred in water containing decayed vegetable matter (like that in which cut flowers have been kept some time) are eagerly devoured by the young fry. I think it is difficult to overrate the value of this discovery to the breeder of coarse fish."

But it should be borne in mind that Herr Fruwirth's system has the great merit of simplifying fry-feeding by supplying natural food in large quantities.

In many ways the artificial cultivation of salmon and trout is far easier than that of coarse fish. Not only is the feeding of the fry of the *Salmonidæ* in its early stages of existence better

provided for by Dame Nature, but the difference in the eggs almost precludes the possibility of their being treated in the same way. "The eggs of coarse fish," says Mr. Marston, "are adhesive, making their manipulation extremely difficult; so much so, that while ninety-five per cent. of salmon and trout eggs can be hatched out, those who have attempted to treat coarse-fish eggs in the same way have rarely succeeded in rearing even five per cent. The eggs of the coarse fish hatch out in a very short time, a week or ten days being the average time required."

The almost impossible transportation of the adhesive strings of eggs has, therefore, been another of the great difficulties in coarse-fish breeding; but several intelligent people have successfully combated this difficulty and invention has once more been brought forth by necessity. One very ingenious plan (we forget for the moment the name of its author) is to make a square box like a collector, and to line it throughout with fir-branches. Into this box the fish are introduced when about to spawn,

and the eggs adhere to the fir-branches. After spawning the fish are removed, and the box can be carried away to any stream or pond where stocking is required. In all fish-ponds a few breeding-hurdles are very necessary. They consist simply of hurdles interwined with branches of fir or other trees, and sunk in the water in a quiet spot. The fish cast their spawn on the hurdles, which can then be lifted out and transferred elsewhere. Mr. Buckland recommended that these hurdles "should be placed on the top of the water, and fixed there by posts;" but perhaps the sunken hurdle is a better plan.

The quantity of fish that water will carry remains a moot point amongst pisciculturists. Mr. Roger North, nearly two hundred years ago, gave his opinion that of fry six or eight inches long "you may put a hundred into four rods square of water, or near that proportion; these then can be fed up like chickens, and in time turn to great profit; because, considering a pond will, though but four acres, feed up 1600 carp in two, and perhaps one year, from

ten to eighteen inches, fit for your table, present, or sale. . . ." Captain Milton Peirce says that "nursery-ponds, if in proper condition and containing a good growth of aquatic plants, will support one thousand to fifteen hundred yearling carp per acre area of water. Stock-ponds, in like condition, will support five hundred two-year-old carp per acre. Under no ordinary circumstances should larger stock be permitted. Over-stocking carp-ponds would produce the same result as over-stocking pastures with cattle." It is far better to under-stock a pond than to over-stock it, as in the latter case, the fish dwindle in size, and in process of time the breed utterly degenerates.

Under good conditions the increase of fish is something enormous, for the experience of Herr Max von dem Borne, who in 1885 got more than eighty thousand fine young fry from five hundred carp (spawners and milters), is by no means uncommon. But in all fish-ponds, large or small, only one kind of fish should be allowed at a time; if many varieties of fish are mixed in the narrow limits of a pond, they not only

come to but little good, but they devour each other, and thereby encroach on the privileges of their proprietor.

Fish-ponds such as we have attempted to describe offer three rewards—good monetary interest, an absorbing occupation, and an immense increase in the supply of cheap and wholesome food for the nation.

THE END.