

FAMILIAR FISH



EUGENE M. McCARTHY

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AMERICAN FOOD FISHES

FAMILIAR FISH

THEIR HABITS AND CAPTURE

A PRACTICAL BOOK ON
FRESH-WATER GAME FISH

BY

EUGENE McCARTHY

AUTHOR OF THE LEAPING OUANANICHE,
A TALE OF LAKE ST. JOHN, ETC.

WITH AN INTRODUCTION BY

DR. DAVID STARR JORDAN

PRESIDENT OF LELAND STANFORD JUNIOR UNIVERSITY

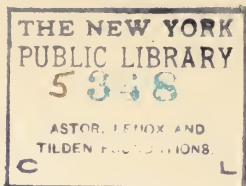
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PREFATORY NOTE



EVERY healthy boy, every right-minded man, and every uncaged woman feels, at one time or another, and maybe at all times, the impulse to go a-fishing. That is what fishes are for: to call us away from newspapers and counting rooms, school books and parlors and five-o'clock teas, out into the open of existence, where life is real and banks are green, skies are blue, and the birds sing in the branches over the water.

It does not matter much what fishes are in the streams. Still less is it essential that we should succeed in catching them. The main thing

"Born beneath the Fish's sign."

is the breaking away, the going in search of them, the generous feeling of brotherhood, and that trusting of ourselves to the lap of our generous Mother, which we have inadequately called "communion with Nature."

Yet it is well to know in advance something of where we are going, what fishes we shall find, and with what means we shall call them forth to suit our pleasure. To give this is the purpose of this book. Its writer is a successful angler. He is a good fisherman. He would teach others to be successful. Not that he would train them to be "fish hogs," or teach them to make a longer string or fill a bigger basket than any hogs before them. These things are abhorred of gods and sportsmen. It is better far to lie about your great catch than to make it. The fisherman's lie is natural and sportsmanlike. His greed is not. It is, I am sure, the wish of the author that the reader should make his catch in sportsmanlike fashion, that he should learn to love the streams and their inhabitants, and that so loving, as the seasons go on, he should return to river, rod, and fly again and again, finding each year in the stream the fishes that his need demands. For it is written that to be "born beneath the Fish's sign" is to bear through life the subtle influence of the "happiest of constellations."

DAVID STARR JORDAN.

PALO ALTO, CALIFORNIA, *February 10, 1900.*

AUTHOR'S INTRODUCTION



Studying angling.

THAT “all work and no play makes Jack a dull boy” is a saying the truth of which can not be denied, whether it be applied to boys of young or mature years. Occasional recreation is required to maintain good health, but it must not be

allowed to interfere with serious work of any nature. With the hope that those whose inclinations tend toward the harmless and health-giving sport of angling, and others who may become converts to it, may both find necessary and helpful instruction in the art from its pages, this work has been prepared.

The difficulties to be met with in endeavoring to teach one how to fish successfully through the medium of a book are best explained in the following passage from the introduction to Isaac Walton's *Compleat Angler*, published in 1653. The extract

sets forth most clearly just what should be said in advance to intending readers of this volume :

“Next let me tell the Reader, that in that which is the more useful part of this Discourse, that is to say, the observations of the nature, and breeding, and seasons, and catching, of Fish, I am not so simple as not to know, that a captious Reader may find exceptions against something said of some of these : and therefore I must entreat him to consider, that experience teaches us to know, that several countries alter the time, and I think almost the manner, of Fishes’ breeding, but doubtless of their being in season. . . .

“Now for the Art of Catching Fish, that is to say, how to make a man that was none, to be an Angler by a book ; he that undertakes it shall undertake a harder task than Mr. Hales, a most valiant and excellent Fencer, who in a printed book, called ‘A private school of Defence,’ undertook to teach that art or science, and was laughed at for his labour. Not but that many useful things might be learned by that book, but he was laughed at, because that art was not to be taught by words, but practice : and so must Angling. And note also, that in this Discourse I do not undertake to say all that is known, or may be said of it, but I undertake to acquaint the Reader, with many things that are not usually known to every Angler ; and I shall leave gleanings and observations

enough to be made out of the experience of all that love and practise this recreation, to which I shall encourage them. For Angling may be said to be so like the Mathematics, that it can never be fully learned; at least not so fully, but that there will still be more new experiments left for the trial of other men that succeed us. . . .

“I shall stay him [the Reader] no longer than to wish him a rainy evening to read this following Discourse; and that, if he be an honest Angler, the East-wind may never blow when he goes a-Fishing.”

To guard against any possible errors in the descriptions of different fishes given in this book, and to be justified in advancing the claim that they are absolutely reliable and correct, the manuscript was submitted to Dr. David Starr Jordan, President of Leland Stanford Junior University, whose rank as a scientist, educator, and publicist requires no definition. For the courtesy of this thoroughly equipped ichthyologist in reading the manuscript, passing upon its scientific accuracy, and writing his graceful Prefatory Note, I desire to make my grateful acknowledgments.

CONTENTS

CHAPTER	PAGE
PREFATORY NOTE	v
AUTHOR'S INTRODUCTION	vii
I.—A LESSON IN ADVANCE OF THE SUBJECT	1
II.—THE HATCHING AND PROPAGATION OF FISH	6
III.—THE SALMON, AND MEMBERS OF THAT FAMILY	17
IV.—THE OUANANICHE AND THE SEA TROUT	32
V.—THE BASS FAMILY	41
VI.—MUSKALLUNGE, PIKE, PICKEREL, PIKE PERCH	56
VII.—MISCELLANEOUS FRESH-WATER FISH	67
VIII.—FISHING TACKLE—WHAT TO SELECT	85
IX.—THE TACKLE BOX AND ITS CONTENTS	95
X.—FLY FISHING	102
XI.—HOW TO CATCH SALMON AND TROUT	111
XII.—OUANANICHE AND SEA-TROUT FISHING	126
XIII.—ANGLING FOR BASS	136
XIV.—HOW MUSKALLUNGE, PIKE, PICKEREL, AND PIKE PERCH ARE CAUGHT	146
XV.—ANGLING FOR OTHER FRESH-WATER FISH	158
XVI.—CAMPING—HOW, WHEN, AND WHERE	164
XVII.—SPECIAL HINTS FOR ANGLERS	179
XVIII.—COMPRISING A CHAPTER ON DON'TS	194
XIX.—OPEN FISHING SEASONS IN UNITED STATES AND CANADA	200
XX.—SCIENTIFIC NAMES OF FISH MENTIONED	209

LIST OF ILLUSTRATIONS

	PAGE
How not to catch fish	<i>Frontispiece</i>
"Born beneath the Fish's sign"	v
Studying angling	vii
Familiar fish and how to catch them	1
How to learn the rudiments of fishing	3
Trout egg ready to hatch	6
A fish way	9
Trout three days old	14
Just caught	17
Atlantic Salmon	19
Pacific Salmon	19
Brook Trout	21
Rainbow Trout	25
Brown Trout	27
Lake Trout	27
A bit of Lake St. John	32
A 7½-pound Onananche	34
Bass jumping	41
Small-mouth Bass	43
Large-mouth Bass	47
Strawberry Bass	49
Rock Bass	51
White Bass	53
A place for Pickerel	56
Muskallunge	59
Pike	59
Head of Muskallunge, Pike, Pickerel	60
Pickerel	63
Pike Perch	63
Still fishing	67
Yellow Perch	69
Yellow Perch eggs	70
White Perch	72
Scale Carp	74
Leather-back Carp	76

xiv FAMILIAR FISH, THEIR HABITS AND CAPTURE

	PAGE
Catfish	79
Fresh-water Sheepshead	81
Burbot	83
Necessary tackle	85
Sizes of lines	90
Sizes of hooks	91
Kinds of hooks	92, 93
Snell hooks	93
Sizes of oval spoons	94
Sizes of kidney spoons	94
Tackle box	95
Leader box	96
Drinking cup	98
Cod hook	98
Fish basket	99
Rod case	99
Tying gut	101
A well-tied fly	102
Salmon leaping a fall	111
Playing a Salmon	113
A Trout stream	117
Angling for Trout	120
Canoeing for Ouananiche	126
Playing a Ouananiche	129
A string of Ouananiche	131
Ouananiche Pool	133
A good string	136
Playing a Black Bass	139
Spinner with Minnow	140
A trolling spoon	146
Double and treble hooks	148
A gang of hooks	149
Above-water tip-up	153
Under-water tip-up	155
Hook disgorgers	157
Three Perch at a cast	158
A camp breakfast	164
A bark camp	167
A camp bed	169
A tent camp	171
How to cook over a camp fire	177
A fisherman photographer	179
Bass swimming (from life)	183
A releaser	184
Figure of fish, showing the location of parts usually referred to in descriptions	187
A frog spear	189

FAMILIAR FISH, THEIR HABITS AND CAPTURE

CHAPTER I

A LESSON IN ADVANCE OF THE SUBJECT



THE best advice to give modern seekers after sport is to become fishermen. Study the art a little and practice it much. Nothing can be more harmless, since only the nobler feelings are aroused. It can only result in complete satisfaction. Seek the wilderness—the farther away from civilization the better it will be.

First of all, it is absolutely necessary to know the “how,” “when,” and “where” of fishing. To learn this, one must begin at the very beginning—the hatching and breeding of the various game and food fishes, which will give an insight into their nature. A study of their names, distinguishing marks, and habits comes next. When this has been acquired it

naturally follows that one should gain a thorough knowledge of tackle—rods, lines, reels, and especially natural and artificial bait—and how to arrange and use it. All this comprises the “how.” The “when” is learned in connection with it, since in studying it the nature and habits of fish become readily known. Thus the proper time to catch them is indicated, and the “where” as well. Any boy at all enthusiastic over angling generally knows where to go “a-fishing.” Add to this knowledge that which has been acquired through proper study, and the result is that the beginner soon becomes an adept, successful, full-fledged fisherman. It can be readily understood that the study of fishing is neither a long nor an unpleasant task in any way, but, on the contrary, has a peculiar fascination.

It is very unfortunate that the natural supply of fish is constantly being depleted by two avoidable causes: one, excessive greed—the desire to take more fish than can properly be disposed of; the other, the ignoring of all game laws by taking fish out of season. The opportunity to make large catches frequently occurs. If the temptation can not be withstood, then remove the fish carefully from the hook and return them to the water, retaining only those badly injured, or a sufficient number to supply actual wants. That certainly should satisfy any inordinate craving to



How to learn the rudiments of fishing.

4 FAMILIAR FISH, THEIR HABITS AND CAPTURE

catch fish. Just remember that there are many other fishermen to follow you in the years to come. They will be equally enthusiastic anglers, and equally desirous of success. Why not leave some fish for them, and for yourself another day as well? Avoid willful, useless slaughter of any kind.

Too much can not be said against the violation of the game laws—the taking of fish out of season. It is not only an illegal offense, punishable by heavy penalties, but, what is far more important, it prevents their natural increase, which is most necessary. Close seasons were made to protect certain fish during their spawning time, when they are easily taken, especially in the vicinity of the hatching beds. Each fish so caught means the loss of hundreds and thousands of young fish about to be hatched out. It is not necessary to caution a good sportsman in regard to this matter, but it is necessary for all to co-operate and prevent others from violating the law. Protect all game and food fish in every way possible.

A few words of caution against carelessness may be spoken here, especially to young anglers. Accidents are to be attributed almost entirely to this cause. As the greater amount of fishing is done from a boat, constant watchfulness should always be practiced. Avoid haste and dangerous places. It is better to lose a fish, or a day's fishing, or even to walk

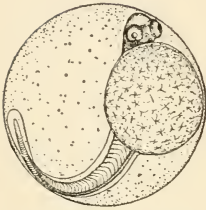
a mile, than to have an accident occur through being too hasty, or attempting a difficult passage. The safest kind of a boat is dangerous when improperly handled. Rapids, falls, and rough waters should be avoided, unless a skilled hand guides the craft. One can not handle a boat properly and fish at the same time. An attempt to do this invites disaster and certainly prevents success.

The angler must be prepared for much disappointment, for fish will not bite constantly, nor every day. They have peculiar, unexplainable moods that continuing favoring conditions of water, wind, and weather can not control. An understanding of their nature and habits, together with a good knowledge of tackle and how to use it, greatly increases the chances of success. At all events, patience must be practiced, and the poor fish should not always be blamed.

Owing to the close similarity of various fish—members of the same family—many errors are made by fishermen in giving them their proper names. To understand their distinguishing marks, consultation of many Fish Commission reports is often necessary. To properly distinguish and name fish is very necessary; to know how to catch them, absolutely so. To present this knowledge in an authoritative, compact form is the aim of the following chapters.

CHAPTER II

THE HATCHING AND PROPAGATION OF FISH



Trout egg ready to hatch.

ALMOST everything material is the result of a very small beginning, and especially is this true of fish. Their beginning is in an egg, and in nearly all cases a particularly small egg—so small, in fact, that usually ten or twelve will cover a space only one inch long. There is absolutely no form of life, either of mammals, birds, or reptiles, that Nature has planned to bring forth its kind so numerously as does the fish. That this was a most wise provision will readily be understood when it is known that the enemies that feed upon the eggs and the fish themselves, through all stages of growth to full size, are innumerable. As the season of the year for spawning arrives, the female fish will be found to contain a very large number of eggs—a quantity difficult to estimate, but usually averaging

many thousands. To illustrate, it is well to note that a salmon of 20 pounds will average about 16,000 eggs; a 5-pound ouananiche, 4,000; a 2- to 4-pound rainbow trout, 3,000; the brook trout averaging somewhat less. The lake trout is estimated to yield 1,000 eggs to each pound of its weight; a 2½-pound black bass will range from 2,000 to 10,000, the large-mouth variety averaging more. When ripe, the eggs are deposited upon the spawning beds, which vary in location with the nature of the various fish. It can be given as a general rule, however, that a gravel or stony bottom usually forms the bed, although grass and weeds are selected by some varieties. Many fish seek shallow running water for their hatching ground; others, quite deep waters in lakes and ponds. Many eggs are imperfect or undeveloped, or not milted upon by the male fish.

From the moment the eggs are being dropped the many enemies of the fish commence their attacks, and it really seems strange that a single one should ever hatch out or attain its growth. So-called bottom fish, comprising bullheads, suckers, and carp, are the greatest destroyers of eggs. The bullhead and carp live exclusively upon spawn during the season, and devour it in such quantities that they have often been taken so completely filled as to be absolutely unable to move. It is a great pity that the carp was

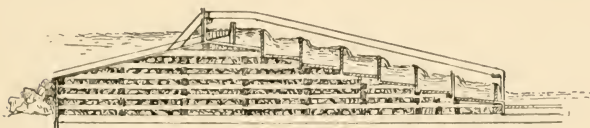
ever introduced from Germany into American waters. It is not even a fair food fish—not sufficiently fine to compensate for its great destruction of spawn. In confined waters, especially, it will in a few years absolutely exterminate all other fish by destroying their eggs.

Frogs, and some aquatic birds, too, feed upon fish eggs, while wading and swimming birds dislodge them from the beds, and thus cause them to be carried away by the current and lost. Male trout have often been seen upon a spawning bed, catching and devouring the eggs almost as rapidly as they are dropped by the female. This is common practice with other fish as well. But when the eggs that have escaped destruction have in due time hatched out, the enemies multiply. Young fish recently hatched are called fry, and from that stage, during growth until maturity, and even after, they are the natural food of larger fish, even of their own kind.

The fouling and poisoning of streams and rivers by the refuse from mills located upon them have done much to destroy fish generally. This defilement, together with the erection of dams without proper fish ways, absolutely prevents fish from ascending to the spawning beds. So serious had both of these evils become some years ago, that the United States Government, and most of the State governments

individually, passed stringent laws against the defiling of streams, even with sawdust, ordering at the same time that all dams should be provided with fish ways.

With all the various destroying agents just mentioned interfering with, and in some instances absolutely preventing, the natural hatching of fish, it seems strange that any of the game and food varieties should have been left. Had not artificial hatching and propagating been resorted to, there certainly would not have been. This fact was long since rec-



A fish way.

ognized by the United States and State governments; hatcheries were built and fish commissions formed to care for them. The first attempt to hatch trout artificially was made in Ohio in 1853, and was very successful. A large number of hatcheries are now located at suitable points all over the country. Immense numbers of fish of many varieties are hatched there and raised to a sufficient size to insure their reaching their full growth when planted in rivers and lakes. This method prevents the destruction of both eggs and young fish, causing a very much larger proportion to grow to full size than would be possible

under natural conditions. To illustrate this it may be stated that those familiar with the subject claim that not even twenty per cent of the eggs deposited in a wild state are hatched out to reach the fry stage, and that but a small proportion of these reach maturity. In artificial hatching ninety-five to ninety-seven per cent are usually hatched out, and nearly that amount can be raised to a proper size to plant in various waters.

The best advice to give a young fisherman is to ascertain the location of the nearest Government or State hatchery, and to visit it at the proper season, allowing ample time to study its workings. Since that is not always possible, however, a description of the artificial hatching and propagation of fish will be necessary. The methods followed with the many varieties would require a volume by themselves; therefore it is better to select one representative fish, and explain the process fully. As the details of the work are very similar with all species, sufficient insight will be given into them in this way to insure a good general understanding of the whole subject.

The spawning season of the different fresh-water fishes varies to such an extent, that nearly every month of the year is represented by some one variety. Again, in different parts of the country, the particular season of a species varies materially. This, of

course, is caused entirely by the climate—whether warmer or colder. Then, also, the different temperatures of waters in the same neighborhood make a material difference. Thus, black bass commence to spawn soon after the ice leaves. In large shallow lakes and rivers, where the waters warm rapidly, April and early May is their season. In deeper, cooler waters it extends through May, and even into June.

Perhaps the best fish to illustrate the process of artificial hatching and propagating, is the most popular one with all fishermen—the brook trout. The greatest efforts have been directed toward multiplying this member of the salmon family on account of its popularity, and absolute success has been attained. October is the regular spawning season of the trout, although September or November may be the time, in the case of very warm or very cold waters.

Beyond any question the brook trout is absolutely the handsomest and most delicate fish we have in the East. It is found only in the cleanest and purest cold water, the least contamination sufficing to drive it away. Living entirely upon live food, the brook trout rarely, if ever, devours anything dead. As the spawning season approaches, these fish ascend the small streams, seeking shallow spots with a clean gravel bottom, over which a good current flows. Here the female removes the sand with her tail, and,

pushing aside the gravel with her nose, forms a shallow nest. In this the eggs are deposited, and, when milted upon by the male, are covered with loose gravel, then left until hatched.

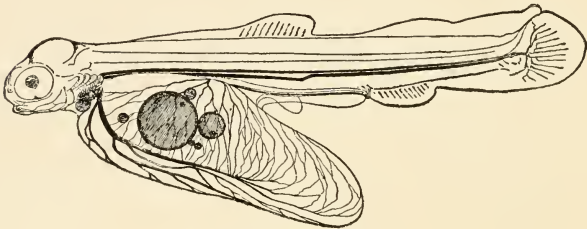
During the spawning season large quantities of eggs are secured from wild fish by the hatcheries at the natural beds. Many trout are also taken in nets throughout the year and kept in ponds until ripe, but as the facilities for keeping a quantity of fish are limited, an additional amount of spawn must be secured. The beds are easily found, and when the trout arrive, they are taken, a few at a time, in small nets. An expert employé can note in a moment if a fish is ripe; if not, it is returned to the water. When the fish is held by the tail the eggs will move toward the head, leaving the stomach shrunken; if it is unripe this will not occur. The eggs and milt from the females and males are dropped separately into pans and at once gently mixed with a feather. After standing a few moments, they are carefully and constantly washed in pure running water until absolutely clean. The eggs, heretofore adhering, separate in an hour or less, and are then placed in gravel-bottom troughs, and left alone for some thirty days. After that period eye spots begin to appear, whereupon the eggs are placed in gauze-covered trays, in troughs of running water, there to remain until hatched out.

During the first month the eggs can be packed in especially prepared boxes, and sent without injury to any part of the world. After being placed in troughs or hatching boxes, through which a stream of cold water constantly flows, they must be examined frequently, and all imperfect ones removed. A few bad ones mingled with the others would soon cause all to be covered with a fungus-like growth that would spoil the entire number in the trough. Usually about three months are required to hatch out the eggs, dependent entirely upon the coldness of the water. If it is very cold— 35° to 40° —four or five months will be necessary.

Great care must be taken in handling the eggs, to avoid shaking or jarring them, as any violent or sudden motion is liable to divide the yolks and destroy the germs. Incidentally, it may be mentioned here that the famous double-tailed goldfish frequently seen are raised in Japan, and are produced by violently shaking the eggs in a pan. This causes the hatching of many monstrosities, some with double heads or double bodies, others with double tails, but generally only the latter survive. With the exercise of the greatest care quite a large number of odd fish are hatched out, some having several heads or tails, many double bodies, or are distorted in some strange way. The most peculiar are

preserved in alcohol, and can be seen at any of the hatcheries.

As soon as they are hatched out, the young fish, or fry, as they are called, require great care and attention. Quite a number die, and must be carefully removed for the same reason that prescribes the removal



Trout three days' old.

of imperfect eggs. During the first three or four weeks a small sac remains attached to the stomach of the fish, which Nature provides as its source of nourishment. At this stage their growth is quite rapid, and it is at this time that the young fry can be safely shipped in cans to a distance, to be used in stocking streams. No artificial food is needed, and if the water in the cans is properly aerated by changing it or putting in pieces of ice, but few die during the journey.

When the sacs begin to disappear, artificial feeding must be resorted to, raw liver only being used. This is mashed up in water to the consistence of

pudding, and passed through a fine sieve. A little of it is dipped out at a time on a feather and floated in the troughs, the process being repeated six or eight times a day. The fish eagerly take it. As they grow in size the liver is fed in larger quantities, much coarser, but less frequently. It is necessary also, as they become larger, to reduce the number of fish in each trough, to avoid overcrowding and suffocation. Fish hatched in the winter or early spring will grow from three to six inches in length (fingerlings) by November, but previous to this they have been taken from the troughs and placed in ponds or large tanks. During the summer of the following year they have become yearlings from 6 to 8 inches long, and are ready to spawn in the fall.

It is well to state in connection with hatching that the black bass has been found to be one of the most difficult of fish to propagate artificially, and only within a few years has success been attained. It was with great difficulty that the female could be stripped of her eggs, and it was found necessary to kill and open the male to secure the milt. On this account the fish are now placed in specially built ponds, properly prepared, the hatching out of the fry thus progressing naturally without any artificial aid whatever. As soon as possible the young fish are separated from the older ones, which prevents the

latter from eating them, and enables a much larger number to grow to full size than would under natural surroundings.

With all other fresh-water fishes but little difficulty is found in reaching full success, the methods followed being in general quite similar to those followed in the hatching of trout as just described. The United States Fish Commission is also engaged extensively in hatching out a number of salt-water fish, including cod, mackerel, flounder, tautog, haddock, weakfish, sheepshead, and herring. In addition, special attention is being given to the propagation of the oyster and lobster, since both, the latter particularly, are being rapidly exterminated.

From the foregoing it can be seen that the artificial hatching of fish is very successful, and that without it, and the attendant stocking of the streams with young fish in various stages of growth, many of our best fish would by this time have almost disappeared. The continuation of this good work will prevent the occurrence of this calamity. Any of the fish can be had without cost from the various hatcheries upon proper application to the State Fish Commissioners. It is the duty of all fishermen to see that young fish are supplied to their nearby waters—that is, the proper kind adapted to them. With an allotment planted each year, the fishing will continue uniformly good.

CHAPTER III

THE SALMON, AND MEMBERS OF THAT FAMILY



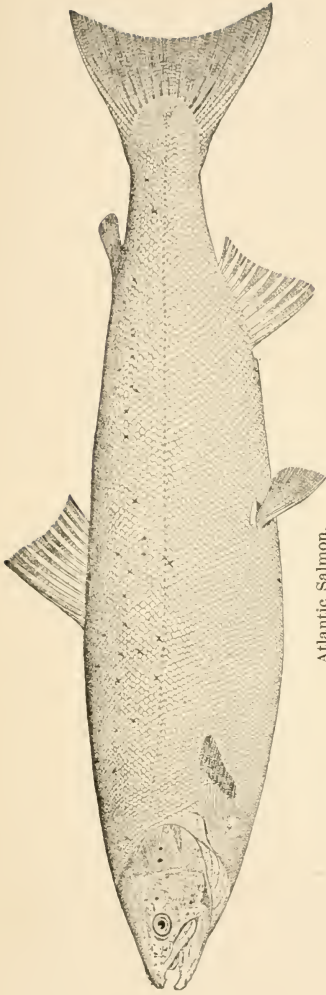
Just caught.

WITH a little study it should not be difficult to distinguish fish, one from another, and to designate them by their proper names. Unfortunately it is a fact, however, that many old fishermen do not make proper distinctions, and, either from habit or lack of knowledge, persist in misnaming them. It is true that in different parts of the various States a certain fish may have a dozen different real names. But this should not interfere with its right to its true family designation. Moreover, it is always better to give a fish its proper or commonly accepted name, as then no error or mistake can occur. No reference is made here to the Latin specific and sub-specific designations, but to the proper English appellation. The most common mistakes are made with different members of the salmon family, and with the varieties of pike, pick-

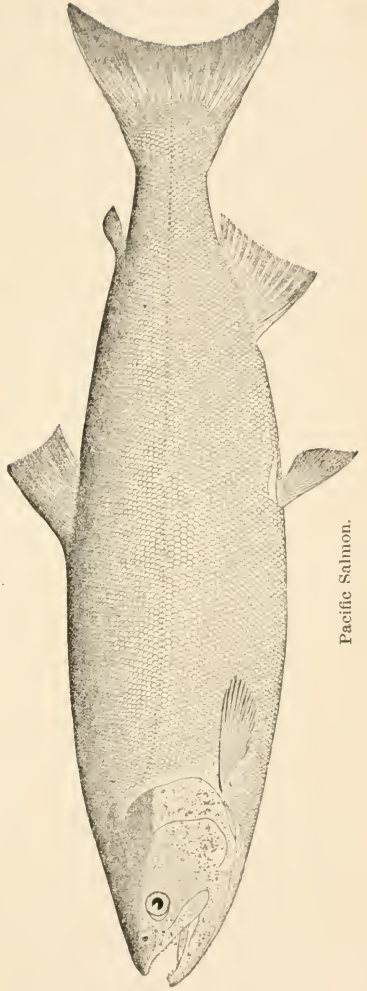
erel, and bass. It is best, therefore, to describe their distinguishing marks and peculiarities in detail, which will enable the young fisherman to recognize with a little practice the fish he has caught, and to designate it properly.

The most important fish—those that are held in the highest estimation at least—are the various members of the salmon family, consisting of the salt-water salmon itself and its direct and indirect descendants. At the head of all stand the brook, or speckled trout, which is most commonly found, the brown trout of Europe, and the rainbow trout of California. The best distinctive mark of the *Salmonidæ*, as the family is collectively called, is a small fin on the back just before the tail. It is called the adipose fin, and is not composed of spines or rays, as are all other fins, but of flesh or gristle. This fin is a characteristic of all the members of the salmon family without exception. It is also found on the various kinds of whitefish and the smelt, which would indicate their relationship to the salmon in the past. The catfishes, too, have it, as well as a number of related groups.

There is no mistaking the salmon among the other fishes of the Atlantic. It is similar only to itself. In the Atlantic Ocean but one species is found, but in the Pacific there are five, known as the king or quinnat, the red, silver, humpback, and dog salmon.



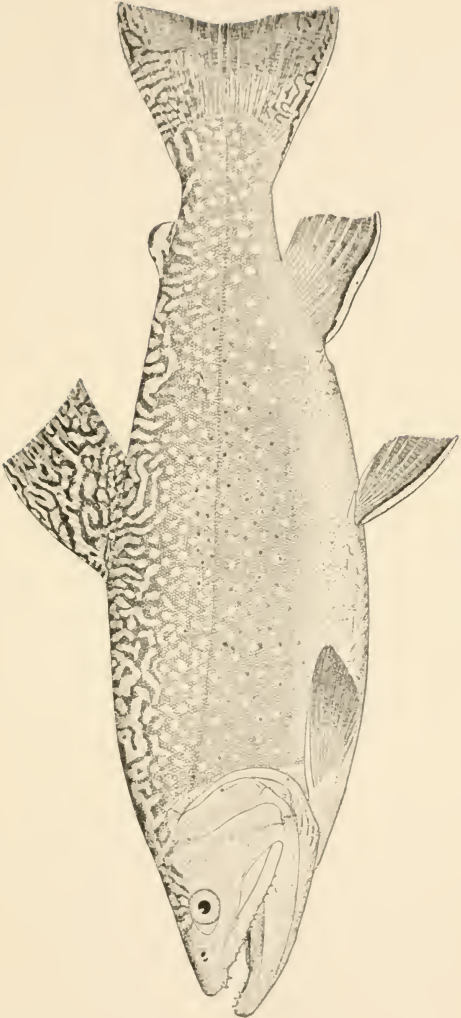
Atlantic Salmon.



Pacific Salmon.

The red salmon, or "redfish"—or blue-back, as it is usually designated on the Columbia River—is most plentiful in Alaska, and is the one mostly used by the many canneries from Sitka northward. The king salmon is the largest and most valuable, however, and is canned in great numbers on the Columbia. It is a curious fact that, while the Atlantic salmon takes the fly readily in fresh water, its five relatives of the Pacific do not. This is because they never feed in fresh water. They are usually netted or speared as, in vast schools, they run up the rivers to the spawning grounds on the Columbia. Sometimes they are caught by means of large buckets attached to wheels, which are revolved by the current. These buckets scoop up the fish as they ascend, depositing them in troughs. To the angler this appears to be a crime, but any method of taking fish wholesale is open to that criticism. Year by year, from Alaska to California, more salmon are caught than are born, and each species is on the way toward partial extinction.

As already stated, the most widely distributed and most plentiful of the salmon family in the regions of the East generally frequented by anglers—the one with which all are familiar—is the brook or speckled trout, red-spotted with markings of green. It is found from Maine to Georgia in all clear waters suitable for its life, westward through the Great



Brook Trout.

Lakes region as far as Minnesota, and in Canada from the Labrador peninsula to the Saskatchewan. Owing to its strong nature and ability to adapt itself to new surroundings, it has been planted in waters to which it is not native, and has thriven there wonderfully. Thus it has been successfully transplanted to streams in Minnesota, Wisconsin, Colorado, Wyoming, and California, and has increased there; but, strangely enough, attempts to introduce it in English waters have not been an absolute success. I quote on this point Mr. R. B. Marston, editor of the *Fishing Gazette*, London: "Millions of fry and yearlings of *Salmo fontinalis* have been put into English rivers, and I know of no single instance where the attempt to stock a river or stream with them has been successful. After a time, not much more than a year as a rule, they disappear. I have seen a long stretch of a trout stream alive with thousands of healthy two-year- and three-year-old *fontinalis* one season, and the next there was not one to be seen; and yet they do well in both this country and in Germany when kept in trout-breeding ponds, and so our fish breeders keep on breeding them and selling them. I suspect the real secret of their non-success in our rivers is that they find the water in the summer months too warm for them."

There is no difficulty whatever in distinguishing

the brook trout from either the rainbow trout or the brown trout, or to distinguish the two latter from each other.

There is considerable variety in the color of brook trout, caused by sex, age, or local conditions. The head, back, sides, and dorsal fin are of a greenish color that often merges into a heavy black, under which are twisted markings or vermiculations of a different shade. There is also a general absence of spots on the back. Neither of the other trout mentioned has these twisted markings, but instead both have spots on the back, these spots being black, as on the salmon, never red.

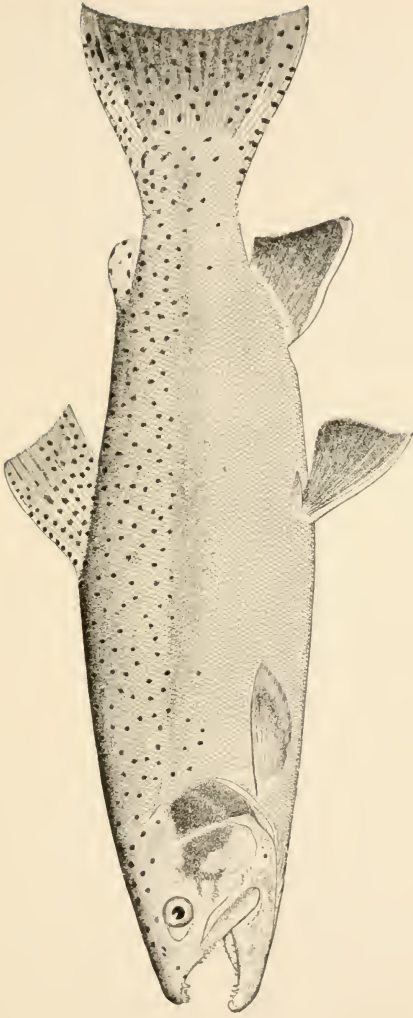
Along the middle of the sides of the brook trout are varying numbers of bright red spots surrounded by cream- or brown-colored areas. The belly is usually a bright, clean, creamy white, with often a red band low down along the side on the male. The lower fins are brown or red, the front edge white, bordered with black. Taken altogether, it is by far the handsomest of the trout family.

The rainbow trout is a native of the clear streams of California, from which region it was brought to the Eastern States. It is known also under the name of "California trout." Its transplantation to the eastern United States has been markedly successful, for it has multiplied there rapidly. Observation and experience

justify the belief that the rainbow trout can be used to stock streams formerly inhabited by brook trout, but in which the latter can no longer thrive owing to changed conditions unfavorable to its habits. The rainbow is also adapted to warmer and deeper waters, and can live where the brook trout can not. They certainly increase more rapidly, as, unlike the brook trout, they will not devour their young, nor will they take a minnow of any kind unless forced by hunger, in the absence of other food.

As is the case with the brook trout, the rainbow varies much in coloring, according to the water it inhabits, its sex, and age. The back is usually of a bluish color, the sides and belly being silvery. Along the middle of the side, running the whole length of the body, is a narrow, semi-distinct, iridescent red or pink stripe. From this marking the fish is properly named. Below this band there are usually no spots, but above and on the back are a large number of plain black ones. It has no colored spots whatever.

The brown trout is the common trout of Europe, known in Germany as "Forelle." It is not necessary to give a detailed description of this fish, for the reason that at present but an insignificant number are being taken. Comparatively few waters have thus far been stocked, and it is only occasionally that one is taken outside. Some years ago a quantity of the eggs

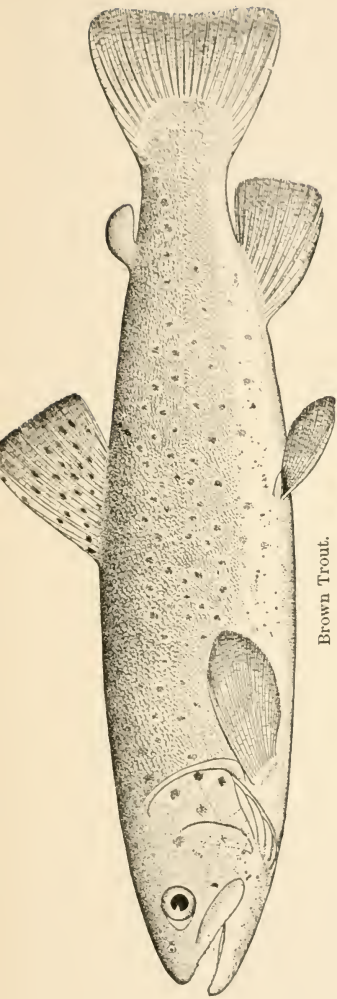


Rainbow Trout.

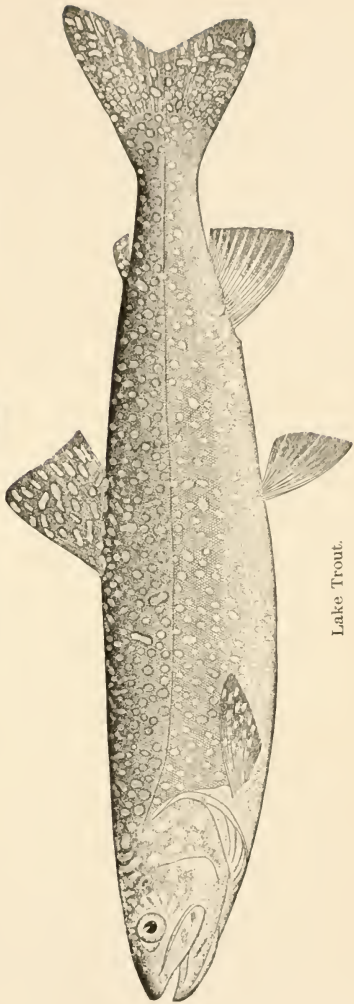
of this fish were sent to the United States from both England and Germany. These were successfully hatched out, and a number of the hatcheries now raise some each year. They are much more voracious than either the brook or rainbow trout, and constantly devour small trout fry and fish—even their own kind. It is not wise, therefore, to plant them in the same waters with other trout. They are easily distinguished from the brook or rainbow varieties. The back and sides are decidedly brown, the back having many black spots instead of the vermiculations of the brook trout. The sides are beautifully spotted with red, and the belly is silvery white.

In shallow streams and rivers, except perhaps during the spawning season, trout of any of the varieties rarely exceed two or three pounds in weight; in fact the average would be considerably under one pound. In deep-water lakes, such as the Rangeleys of Maine and the lakes of the Canadian wilderness, the brook trout has been taken of all weights up to and over ten pounds. In California waters rainbows of twelve pounds have frequently been taken. Brown trout of ten to eleven pounds have been caught in hatchery waters.

Another prominent member of the salmon family, one especially esteemed as a food fish, is the lake trout. It is frequently and improperly called a sal-



Brown Trout.



Lake Trout.

mon trout, this being a name used in England for a large form of trout found in brackish water or in the sea. The lake trout is well classed as a northern fish, being found in northern lakes only. It rarely, if ever, occurs in streams or rivers. The inland lakes of Maine, New Hampshire, New York, Eastern Canada, the chain of the Great Lakes, and westward to British Columbia, are the waters it inhabits. Where found, it usually is plentiful and of good weight, easily averaging from four to ten pounds, and often weighing fifteen to twenty, occasionally even much more.

Differing from that of the other trouts, its tail is decidedly forked instead of square. Its color is a dark gray, and the entire body and fins are covered with pale white or grayish spots. Except during very early spring and the spawning season (October and November), when it seeks shallow stony bars for its beds, the lake trout is decidedly a deep-water fish, and is taken only on the bottom of the lakes. It is omnivorous, eating everything, and cases are known where even corncobs and knives have been found in its stomach. After the minnow period it is too formidable to be attacked by other fish, which materially accounts for its being plentiful. In addition to its prowess it is a very prolific breeder. Much skill and patience are required to catch the lake trout, as will

be shown later ; but one is rewarded for his labors, as it is a particularly fine table fish. Its flesh is of either a light pink or yellow shade, and it is usually boiled. With the whitefish it is unquestionably the most noted fresh-water food fish.

The lake trout can readily be recognized from the brief description given above. There is no other fish that resembles it in any way.

There are several minor trouts to be mentioned to complete the subject, but as they are not at all plentiful, or are only found in special localities remote from the Atlantic seaboard, a detailed description is not necessary. Such are the cutthroat of the Rocky Mountains and the Pacific coast ; the Tahoe trout ; the steelhead trout of California ; the Loch Leven trout, a few of which were introduced by the United States Fish Commission ; the blue-back trout of Maine ; the red-spotted trout, or Dolly Varden, of the West ; the saibling of Europe, and its near relative, the Sunapee, or golden trout. The last named is found only in Sunapee Lake, New Hampshire, and one lake in Maine, and is in reality one of the most charming of the trout family.

Properly speaking, the grayling should be mentioned in connection with the *Salmonidæ*. Unfortunately, its habitat is confined to a very limited area of country, and it is therefore known to but comparatively

few anglers. Primarily it is native to the rivers and streams of Alaska, but it is found also in some of the streams on the west side of the Yellowstone Park, and in the rivers of northern Michigan. In Michigan, however, it is being rapidly exterminated by anglers, and to a far greater extent by sawmills. It is beyond question one of the most beautiful fish found in the United States, not even excepting the male Sunapee trout. Its color is a brilliant, purplish gray, the sides of the head having bright bluish and bronze reflections. The fins have alternate rows of rose, dark, and green colored lines or spots. It is impossible to describe properly the beauty of this fish; it must be seen to understand Nature's painting. Being also an especially game, hard fighter, it easily takes its place in the foremost rank of the salmon, or more especially the trout family.

The different whitefish that are supposed to have descended from the salmon in the past are a superior food fish, but are caught only in nets. On this account no further mention or description of them is necessary. The lake whitefish, the cisco, or herring, and the round whitefish, or frost fish, comprise the family.

It is well to state that all the small-scaled, red-spotted trout are known in England as "chars." The meaning of the name is "red," or "blood"; hence,

also, "blood-colored," or "red belly." As this color is found to a greater or less extent in all the trouts, the appropriateness of the appellation is easily seen.

This review of the salmon family would be far from complete were the subject of sea trout and a description of the ouananiche or so-called landlocked salmon omitted. These varieties are coming into increased prominence through the large number of fishermen now seeking them, and as comparatively little is known regarding them, they are worthy of a chapter to themselves.

CHAPTER IV

THE OUANANICHE AND THE SEA TROUT



A bit of Lake St. John.

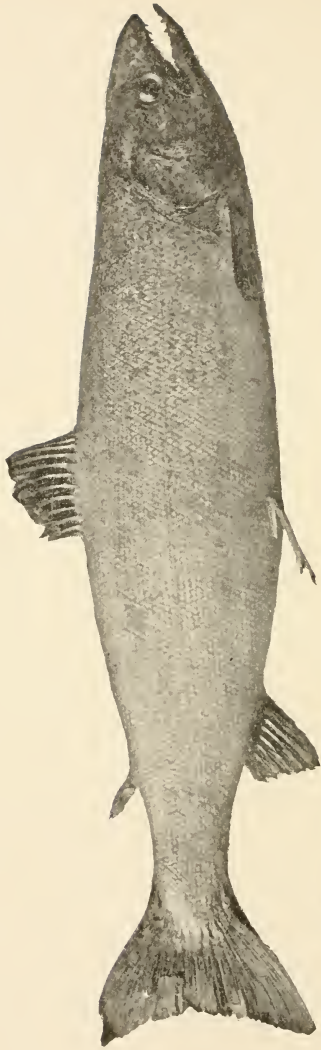
THE ouananiche, or landlocked salmon of Canada, has come considerably to the fore in the past few years, and beyond question it is the most-talked-of fish among anglers to-day. Its natural home is in Lake St. John, Province of Quebec, and its tributary waters, as well as in some of the rivers of the Labrador peninsula. A variety of the salmon closely related to it is the ordinary landlocked salmon of the Maine lakes. The ouananiche of Canada is more properly a rough-water fish, generally found in the rivers, the smaller portion being caught in the lakes; but in Maine the landlocked salmon is almost entirely taken in the dead water of lakes.

The name ouananiche is of Indian origin, probably given to it by the Montagnais Indians of Lake

St. John. Properly translated, it means "ouanan," "salmon," "iche," the diminutive "little"—"little salmon." To call the fish landlocked is an error and a misnomer, as it is to some extent anadromous—that is, it can and does seek the sea. Lake St. John is open to the ocean through its outlet—the Saguenay River—which empties into the St. Lawrence. The lower Saguenay is entirely salt, and the ouananiche are frequently taken near its mouth, thus proving their ability to live in salt water.

The Lake St. John fish will average in weight from $2\frac{1}{2}$ to $3\frac{1}{2}$ pounds, with not over 8 or $8\frac{1}{2}$ pounds recorded as the largest taken there. In Maine the average weight is considerably greater, with a record of 20 pounds, and even more. This difference in weight may result from a difference in species or environment. The latter is probably the cause.

The ouananiche is the closest relative of the salt-water salmon known; in reality there is not much difference. Placed side by side and compared, it will be found that their contour, color, markings—in fact, their whole general appearance, excepting size—is very similar. The salmon, of course, is taken very much larger, varying in different localities. A good average is about 20 pounds, but fish of 30 or 40 pounds have often been killed. The home of the salmon is in the sea, the fish seeking fresh-water



A 7½-pound Ouananiche.

rivers only in the summer to spawn; the habitat of the ouananiche is naturally in fresh water, and the only differences between the two are those resulting from the difference in habits.

When first taken from the water the ouananiche has a beautiful peacock-blue cast of color, which disappears at death, changing to the light-gray back and sides and silvery belly of the salmon. A number of black spots are found on the gill covers, and the St. Andrew's cross markings on the upper part of the body are numerous.

Pound for pound, the ouananiche can greatly out-fight the salmon, and none of the fresh-water fish can equal it in this respect. The black bass approaches it the nearest, but never equals it. A good lusty 3- or 4-pound fish requires fully ten minutes or more to be tired out and killed, and he is a fortunate fisherman, indeed, who does not lose nearly as many as he saves. Their leaps from the water are not only constant, but something wonderful in height, and will average eight or ten in number before they are brought to net.

The ouananiche possesses particularly large fins and tail, which increase materially its fighting and jumping powers, and especially enable it to inhabit the rough, swift-flowing waters, where it is found. There is never any difficulty in distinguishing it when

caught, owing to its identity with the salmon, as explained.

In 1875 the United States Fish Commission, recognizing the especial value of the ouananiche as a game and food fish, commenced hatching it, and since that date has steadily increased its activity in that direction. Several of the fish commissions of the States have also undertaken its propagation with splendid results. A large number of lakes have been stocked, and young fish are now frequently taken. But a short time will intervene before the ouananiche will be found in many places. The Maine variety is used for hatching, and, while it differs somewhat from that of Lake St. John, being a deep-, instead of a rough-water fish, it will soon be the most sought after of all fresh-water fish, not even excepting the black bass.

It has usually been believed that the ouananiche is entirely distinct from the salt-water salmon, but now it is generally considered to be a local variety. Why it does not seek the sea, as is the case with its close relative, can not be explained, unless by attributing it to a lack of migratory instinct. A peculiarity of the ouananiche that is difficult to explain is that it is so much smaller than the salmon. The only possible reason to offer is that the fresh waters it inhabits do not afford as plentiful food as does the

ocean. The flesh of the ouananiche, while of the same color and texture as that of the salmon, is much leaner, not having the thick layers of fat found in the latter when just run up from the sea. A possible explanation of this may be found in the fact that the salmon does not feed at all from the time it enters fresh water until it again reaches the ocean. Therefore Nature provides it with this great quantity of fat to live upon.

The methods of artificially hatching the ouananiche vary but little, if at all, from those followed with the other *Salmonidæ*. Perhaps not quite so large a proportion of the eggs are hatched out as in the case of the other species, for the reason that a large number are diseased in some way. The occurrence of white eggs among the normally colored healthy ones is very common, and occasionally the entire lot from a fish is defective. This may be caused by disease or lack of development.

Many anglers are now turning their attention to catching sea trout, either on account of the novelty of the sport or because they believe that they are taking a new variety of fish. That there is novelty in such fishing can not be denied, but that the fish is new in any way certainly can be. For a number of years there was much diversity of opinion among authorities as to the identity of this member of the

salmon family, which now seems to be settled. There is no doubt that the sea trout and the brook trout are one and the same fish. It is broadly claimed that any of the trout can live as well in salt water as they can in fresh, and everything seems to prove the claim to be correct. All trout grow to a larger size in salt water than in the brooks or rivers, and they lose their spots in the sea, becoming pale and silvery in color.

Brook trout originally were found at a distance not greater than three hundred miles back from the ocean in waters tributary to it. Where conditions of temperature were favorable, they invariably sought salt water. When transplanted to, or found in, inland waters, they have adapted themselves to fresh-water conditions as well.

All members of the trout family require cold water for their habitat, averaging about 68° or less. Therefore they must either seek the cold water of the ocean or, if barred from that by long stretches of warm-river waters, they must seek the cold, small tributaries high up in the hills. While trout are found in the highland streams south of New York as far as South Carolina, they are not able to seek the sea on account of the warm, intervening waters. In Long Island streams all trout are seagoing. From that point along the coast northward sea trout are

rarely, if ever, found until the northern shores of Maine and New Brunswick are reached. All rivers flowing into the St. Lawrence as far west as Quebec, as well as those entering the Saguenay and those of the Labrador coast, are especially noted for most excellent sea-trout fishing, and are the favorite resorts of anglers.

To quote from Mr. George Brown Goode: "The identity of the Canadian sea trout and the brook trout is still denied by many, though the decision of competent authorities has settled the question beyond doubt." The best proof of the identity of the two fish is found in a test made a few years since at the Government salmon hatchery at Tadousac, which is located at the mouth of the Saguenay River. Brook trout were taken from inland waters absolutely land-locked from the sea and placed in a salt-water pond at Tadousac. Through close observation it was found that in from two to four weeks the color of the fish changed to a dull gray, and the red spots faded to a dark-cream shade. The fish were then left in salt water several months, and were then placed in a fresh-water inclosure, again being subjected to close observation. Within two to four weeks they changed back to their original vivid colorings, the red spots becoming as bright as when the fish were first taken from their native water. The

transferring from fresh to salt water did not seem to distress them in any way, nor was any change of any kind noted in them other than that of color.

As a further argument it can be added that the rainbow or California trout have free access to the sea, and are frequently taken in salt water along the Pacific coast.

In all ways the sea trout corresponds with the brook trout when taken in fresh water. If taken in salt water, there will only be the variation of coloring mentioned above.

CHAPTER V

THE BASS FAMILY



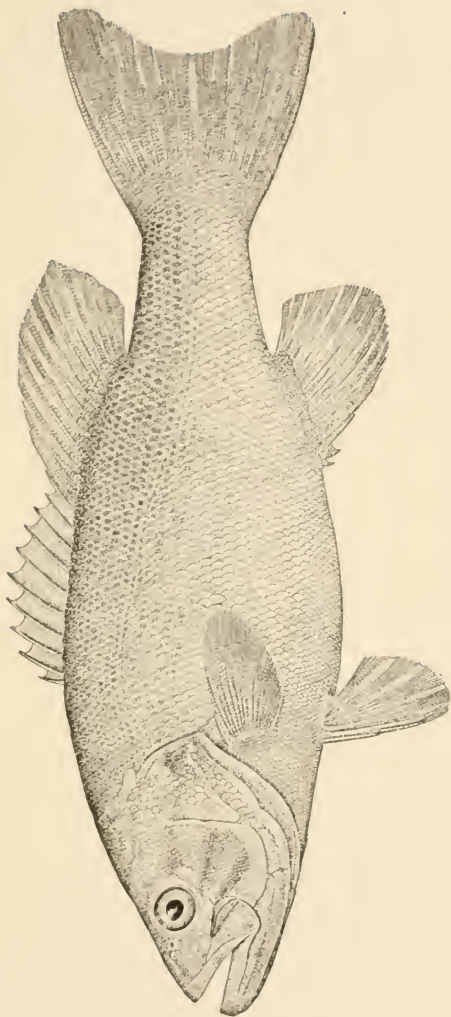
Bass jumping.

FOLLOWING the salmon family, the one next in importance to the fisherman — that of the basses — should be described. There are several kinds worthy of mention, the two principal ones being the small- and large-mouth black bass. To the beginner, at least, it is difficult to distinguish one from the other, as their general appearance is quite similar. There is quite a difference to be found, however, upon close comparison, and considerable variation exists in their nature, habits, and fighting qualities. All members of the family are often found in the same waters, and at one time and place one can take with the same bait small- and large-mouth, calico or strawberry bass and rock bass.

The large- and small-mouth bass are probably the most widely distributed variety of fish throughout

the country. This is especially true of the large-mouth, whose natural range is from the Great Lakes south to Florida, Texas, and Mexico, and west as far as Dakota and Nebraska. The small-mouth was originally found in Canada, and in the United States from Lake Champlain to Manitoba and south to Florida and Louisiana, and across Texas to Chihuahua. Both kinds seem able to stand great extremes of temperature, providing the changes are not too sudden. As they seem to thrive under almost all conditions, it has been comparatively easy to distribute them. They have been successfully planted in all parts of the United States where they were not native, and in the waters of England, France, and Germany as well. Calico and rock bass are found naturally in practically the same waters as the small-mouth. The latter especially has been transplanted quite generally.

The natural food of the black bass varies greatly, being markedly influenced by the weather and the temperature of the water. They are very voracious, and devour their own kind and all other fish indiscriminately. Their natural food comprises crabs, minnows, frogs, worms, dobsons, tadpoles, crickets, and flies. At times both the large- and small-mouth, as all fishermen know, absolutely refuse to take any kind of bait whatever, while at other times they bite



Small-mouth Bass.

greedily at almost anything. Small snakes, rats, and pieces of vegetables have been found in their stomachs.

The black bass watch over their young fish until after they have passed the fry stage, and will attack savagely any other fish approaching. Later on, these young fish furnish food for larger bass, probably for their own progenitors as well.

Because they are distributed so generally over the country, black bass have received a multiplicity of local names, especially in the South. The large-mouth is frequently known as the Oswego bass, lake bass, green bass, yellow bass, moss bass, bayou bass, trout, jumper, and chub. The small-mouth is designated as lake bass, brown bass, ninny bass, hog bass, black perch, trout perch, brown perch, and jumper.

With the exception of the ouananiche, the black bass is the gamest and hardest fighter of all freshwater fishes. No matter by what method it is caught, it makes a very hard struggle for life. Owing to their hard, long-continued fighting, a large number of those hooked are lost, even with the most delicate handling by the most expert fishermen.

There seems to be a variety of opinion in regard to the respective fighting qualities of the small- and large-mouth bass, many fishermen claiming that they should be placed on an equality. This may be true

in the warm waters of the South, but in the colder waters of the North it is not. The small-mouth can well be compared to a bulldog, as it will fight to the last without seeming to tire out. The large-mouth, on the other hand, fights hard for a short time with the same strength as will its relative, but is then taken to net with only a few additional spasmodic rushes. The expert fisherman can generally tell which of the two has taken his hook long before he sees it.

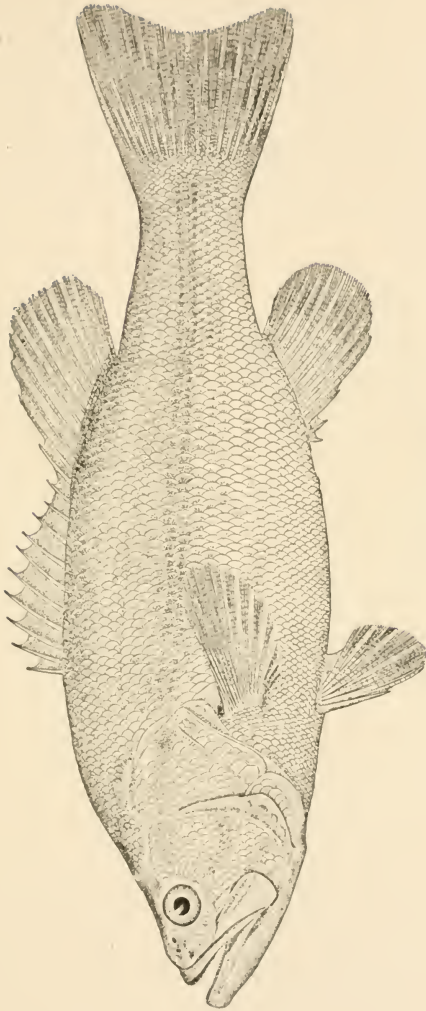
While both species inhabit the same waters, they are usually taken on decidedly different bottoms, the small-mouth being found on stony bars or shoals, varying in depth from two or three to forty or fifty feet, while the large-mouth is generally found in the vicinity of weeds or rushes and on muddy bottom. As the cold weather approaches, the latter seeks deeper water, but always in bays that contain weeds and soft mud. It usually spawns in shallow water, among weeds and rushes bordering the shores; the small-mouth invariably spawns on stony or gravel bottom. There is no question, therefore, that the latter is by far the cleaner fish.

There are three material differences between the two varieties that readily distinguish them. The most noticeable is the size of the mouth, which is much larger in one than in the other. In the small-

mouth, the end of the maxillary, or upper jaw, is just below the eye, not reaching quite to the rear of it. In the large-mouth, the maxillary extends some distance back of the eye, making the mouth very much larger. The second distinctive variation is in the scales. In the large-mouth these are from a quarter to a half larger than in the small-mouth. The former, moreover, has ten rows of scales on the cheeks, the other seventeen. The third difference is in the color and markings. The large-mouth has a dark or blackish green back, greenish silvery sides, and a white belly with a dark band of color extending along the sides, which occasionally breaks up and grows dim as the fish grows old.

The small-mouth is a golden green, with an almost yellowish cast on both back and sides; the belly is white. Dark spots or streaks are found in irregular vertical lines on the sides, but no lateral stripe. A less noticeable difference is in the dorsal fin. In the small-mouth variety it is quite high and arched, not deeply notched. In the other it is not so high, and quite deeply notched.

In point of weight the two varieties usually average about the same in northern waters, the large-mouth, as ordinarily taken, being, perhaps, slightly heavier. Throughout southern waters, however, it greatly exceeds any known specimens of the small-

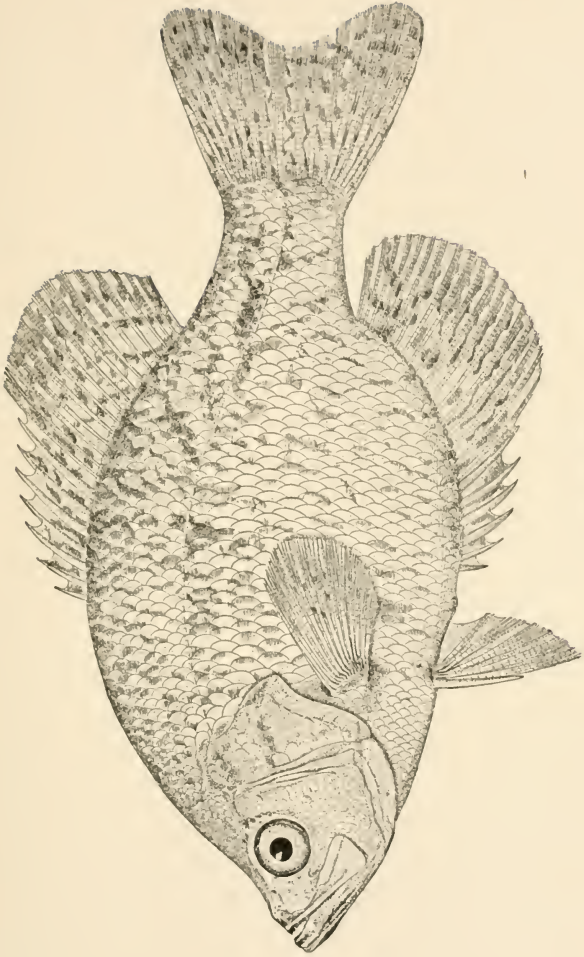


Large-mouth Bass.

mouth by many pounds. There 5 to 8 pounds are far from being uncommon, and 10 to 20 pounds, and a trifle over, have been occasionally caught. Those taken in northern waters will range from 2 to 5 pounds. The largest small-mouth bass of which there is any record weighed 10 and 11 pounds, and only one 13 pounds—all taken in New York State. The average usually caught are from 2 to 4 pounds, with an occasional fish of 5 or 6 pounds. Their size and weight seem to depend upon the quality and quantity of food; when both are right they are a very fast-growing fish.

As stated in the chapter on hatching, black bass are very difficult to propagate artificially, and even when the young fish are separated from the adults, the stronger devour the weaker. Fortunately, Nature seems to raise large numbers, and it can scarcely be questioned that the bass is one of the most numerous of the game fish found in our waters to-day. They rapidly destroy and drive out all kinds of trout, so that great care should be taken not to plant any in trout-inhabited waters.

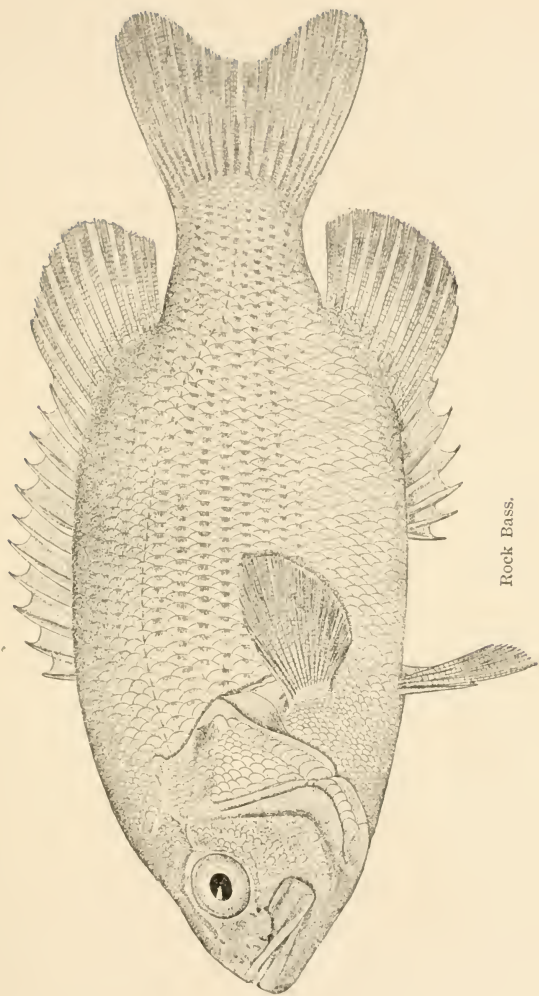
Next in importance of the bass family is the calico, or strawberry bass. This variety is found in practically the same waters as the black bass, but not quite so far south. It is generally believed that they can not live in as warm waters. They are



Strawberry Bass.

very similar in shape and appearance to a sunfish, being short in body, with a high back—in fact, quite round in contour. The usual color is a very light silver-green, with irregular mottled spots all over the body, and fins of a dark-green or olive shade. Very frequently these fish have a decided pinkish color, to which they owe the name of “strawberry.” They are a comparatively small fish, averaging from three quarters to one pound, three pounds being on record as the largest. Almost always in schools, they are usually taken in June, July, and August, but very few being caught earlier or later. They have a remarkably small mouth, are fairly game fighters for a little time, and are very good fish for the table.

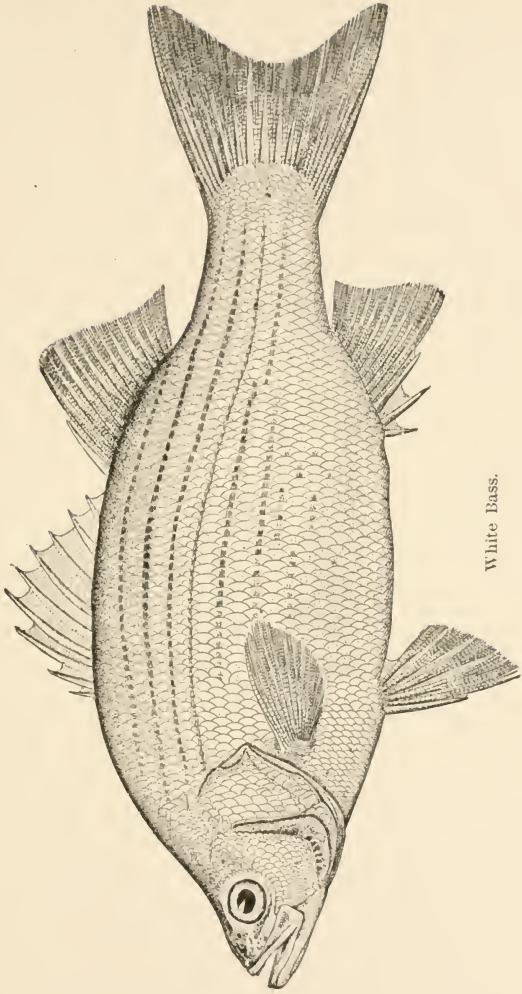
The most disliked of the bass family, the *bête noire* of fishermen, is the rock bass, quite as familiarly known under the name of “goggle-eye” or “red-eye.” Wherever and whenever one fishes for black bass, there will be found this nuisance to take one’s bait and get hooked. Especially is this true when minnows are being used, and one has only a few. They are a small fish averaging from one half a pound to three quarters of a pound, rarely reaching one pound. While fairly good for the table, they are infrequently eaten, perhaps chiefly because of the dislike in which they are held. The average fisherman throws them back with disgust. In shape, they are short and



Rock Bass.

more round than the black bass ; they have an olive-green color with a black spot on the end of each scale, giving the appearance of a broken stripe. In reality, they are rather an attractive-looking fish. They will be recognized at sight, and the recognition will be very frequent ; therefore it is not necessary to give a more detailed description of them.

Another member of the bass family not generally distributed, but admired by anglers where found, is the white bass, known also as the striped bass and silver bass. This species is found only in the Great Lakes and the rivers and lakes tributary to them. They are identical in form with the black bass, but their color is a silvery white. Their peculiarity lies in their stripings, possessing, as they do, five or six black stripes running lengthwise on the back and sides, with usually two or three broken ones below. Their average weight will range from one to three pounds, and they compare favorably with the large-mouth bass in fighting qualities. A species of this fish called the yellow bass is found in the Mississippi River and its tributaries. They seem to be similar in all ways to the white bass, except in color, as indicated by their name. There is no difficulty in recognizing the white bass on sight, as in the limited territory where it is taken there is no other fish similar to it in any way. In the estimation of anglers these



White Bass.

fish nearly, if not quite, equal the black bass in all ways.

To exhaust the subject of the basses completely, the sunfish family, to which they belong, should be fully described. This would be entirely useless, however, as the sunfish are not only small, but not sought after by fishermen, possessing neither game nor food qualities. They are usually beautifully colored and marked, which constitutes their only interest. These fish are widely distributed, and almost every one can recall that his first fishing experience consisted of angling for "pumpkin seeds," by which name they are most commonly known.

A peculiarity of bass, the black bass especially, is their hibernating nature when cold weather and cold water come on. When the winter season approaches, they become more or less dormant, and seek the deepest water possible. Unless it is very deep, they burrow into the mud and remain there during the winter. In such circumstances they seem able to go without food for several months. Even when placed in aquariums, they remain almost motionless during the cold season, and refuse food. Another characteristic of black bass is the length of time they can live when caught. Instances are known where they have lived for several hours after being taken from the water, regaining their wonted liveliness in a few

moments after being put back in their native element.

All of the basses are indeed hardy, and, with the exception of trout, are the fish most sought after by anglers.

CHAPTER VI

MUSKALLUNGE, PIKE, PICKEREL, PIKE PERCH



A place for pickerel.

A GROUP of fishes favorite with anglers, which are usually found in great numbers, are the muskallunge or muscalonge, the pike, pickerel, and pike perch, forming a noble quartet of game

fish. Their range is far smaller than that of the black bass, owing to the fact that they are not to any extent a warm-water fish. They are very plentiful in Canadian waters, and in those of the United States from New England along the Great Lakes to the middle West, and south to Maryland or the Carolinas, which mark their natural limit. All are considered as game fish, the muskallunge and pike perch especially so. These two are extensively hatched and propagated by the Government and some State Fish Commissions; the pike and pickerel are not. There are many other game fishes of more importance that

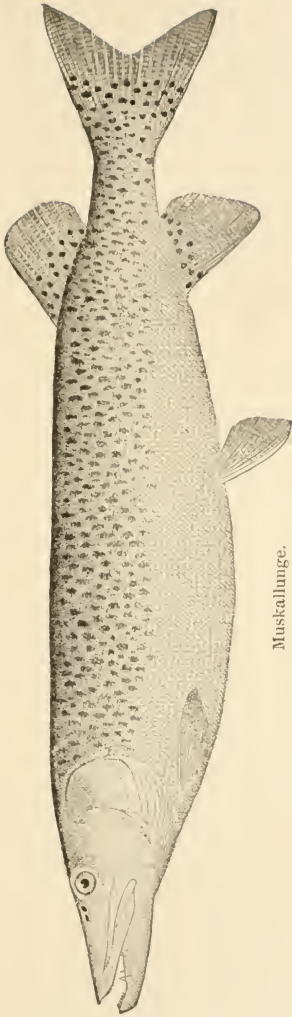
call for much attention, and being prolific breeders naturally, this variety has been neglected.

The resemblance between the muskallunge, pike, and pickerel is very close in general appearance and contour, but in coloring and marking there is some variation, and in the matter of size and weight there is considerable difference. There are a great many fishermen who fail to make a distinction between these three, and persist in calling them all pickerel, just as the pike perch is generally called a pike. One needs to keep in mind only the few points given below to distinguish these fish properly at sight.

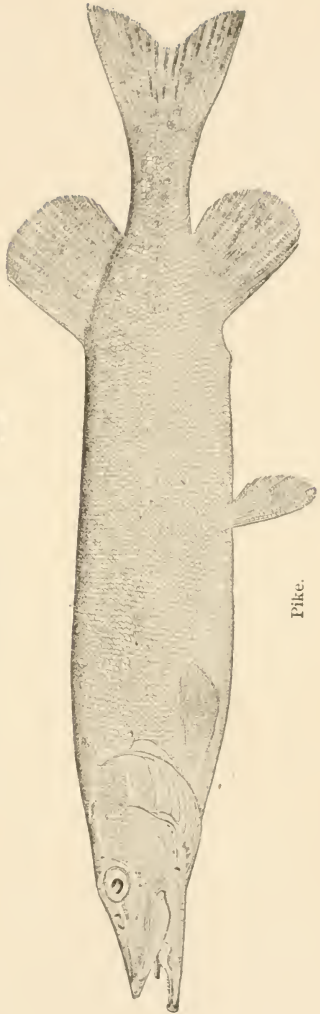
The muskallunge is the greatest of the four, both in size and fighting qualities, but is not as generally distributed as the others. The name seems to be derived from that given it by the Indians of Canada, "maskinongè," the best translation of which is "nasty fish." Not "nasty" meaning "vile" or "bad," but an especially difficult or "nasty" fish to catch. This is, indeed, a most proper name for it, for one of good size on the other end of a line presents a most complicated problem before it is brought safely to net. It is a particularly large fish, reaching as high as 70 or 80 pounds in weight, with an average of from 20 to 40 pounds. It is found usually in water ranging from 5 or 6 feet to 15 feet in depth, especially where the bottom is covered with long weeds. In these it

lies hidden, darting out to seize the large or small fish that form its principal food. It might well be termed a fresh-water shark. The mouth, when open, is very large, armed with sharp, formidable teeth, and the jaws are wonderfully strong.

As already stated, the muskallunge, pike, and pickerel are similar in shape, and they have the same number and kind of fins, placed alike on each. The body or base color of back and sides is a green and yellow, constantly varying in the different fish. Frequently the back and sides will both be either a very dark, medium, or light green, or the color of the back may shade into a greenish yellow on the sides. The belly varies from white to cream with all. Here the similarity of the color of the muskallunge to that of the pike and pickerel ceases. With the muskallunge the markings are black or brown, and are either round spots or vertical irregular blotches or splashes. Occasionally they may not have any markings whatever, but that rarely occurs. Aside from the markings, the simplest and quickest way to distinguish these fish is by the scales on the head. There is a very narrow strip on the top only of the cheek and gill covers. The other fish of the family can be distinguished by noticeable variations from this. With the pike the entire cheek and the upper half only of the gill covers have scales. On the



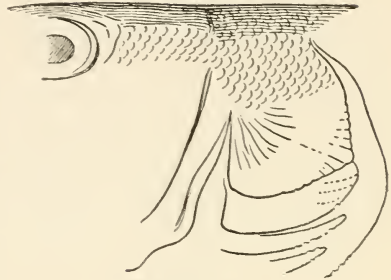
Muskallunge.



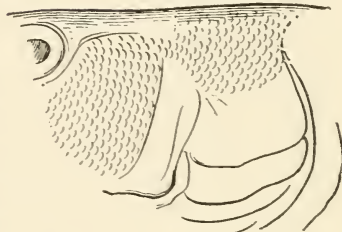
Pike.

pickerel the whole of both the cheeks and gill covers is entirely covered. These distinctions are shown in the accompanying illustrations. This method of recognizing the varieties is absolutely reliable and accurate. As both the cheek and gill covers are quite large even in small fish, there is no difficulty whatever in noticing these characteristics.

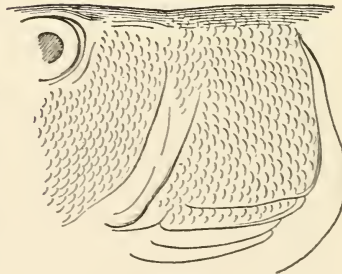
It can be stated, without any controversy or argument, that the true pickerel has rarely exceeded 5 or 6 pounds in weight, while the average is usually from 2 to 4 pounds. It is proper, therefore, in almost all instances, to call any pickerel



Muskallunge.



Pike.



Pickerel.

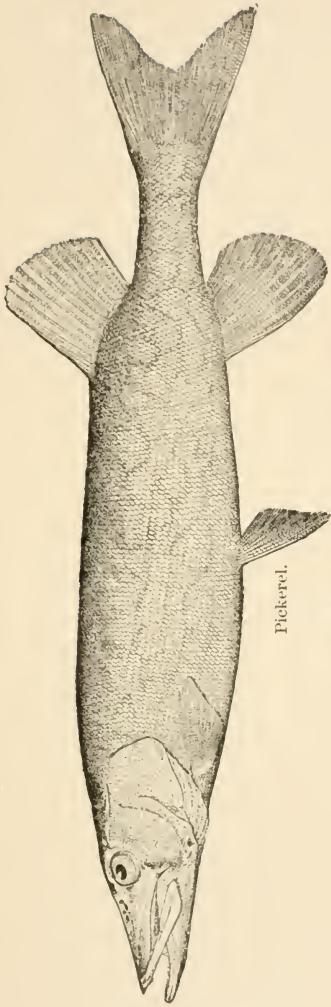
above 5 pounds a pike, as that is what it is, the scale test on the head proving it. Pike weighing from 40 to 50 pounds has been taken in Canada and in some of the Western States, but through the United States generally the average will run from 4 to 8 pounds, with occasional exceptions, up to 20 or 25 pounds.

The name pickerel is used as a diminutive in England, where pike are plentifully found. There the fish is properly a young pike, but in the United States it is an entirely distinct variety of the pike family. This is correct, since it is a different fish, as is shown by the scale markings on the head, the different body markings, and the fact that it is limited in size and weight.

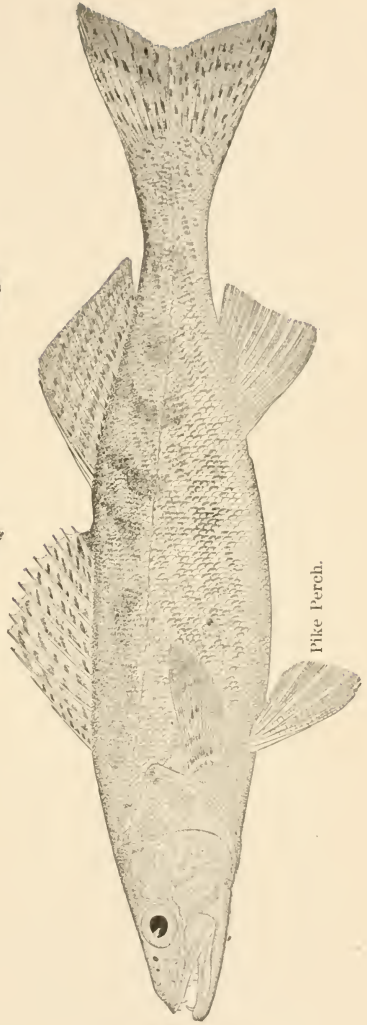
While, as a rule, the pike is differently marked from the pickerel, it varies in this respect considerably, being more distinguishable in some cases than in others. Frequently the difference is slight, thus making it difficult to recognize it in this way. A general rule can be given which can be relied upon in the majority of instances, but not always. It can be generally stated that the pike has a greenish-yellow back and sides, varying from dark to light in different fish, with numerous yellow spots dotted over the entire body. These spots are practically round, as though made with the end of the finger dipped in yellow paint. The pickerel also has spots of the

same color, but they are oblong, or a long oval, running along the side, never vertically. These markings are so plentiful and close together that they almost seem to be the body color, with narrow black or dark-green separations that follow the irregularly shaped contour of the spots. On the pike the yellow spots are not surrounded by any areas of color, but simply appear irregularly against the dark body shades, as though applied with the finger, as stated. In the case of the pickerel, it would seem as though the body color were yellow, divided up into irregular elliptical divisions of varying size, made with a brush dipped in dark paint.

The true pike is found not only in American waters, but generally throughout Europe. It is known in England by the same name as with us; in Germany as the "Hecht," in Sweden as the "Gadda," in Italy as the "Luccio," and in France as the "Brochet." The French name is also applied to it in Canada, especially in the Province of Quebec, and about Lake Superior. In European countries, however, the muskallunge and the true pickerel are never found, both being pre-eminently American. While here the pike is considered by many to be a fairly good food fish, in Europe it is especially prized. Walton gives much space to a description of it, and ends with directions how to "roast him



Pickerel.



Pike Perch.

when caught," telling us that "when thus prepared he is choicely good—too good for any but anglers or honest men."

The fourth member of the group, the pike perch, is worthy of especial mention. This fish is found in the same waters with the pike and pickerel, and far north in Canada. It is most commonly known as the "wall-eyed pike," from the fact that the eyes are very large and protruding. It is also known as a "yellow pike," and in Canada as a "dorè." Nearly all writers have endeavored to have it designated by its correct name, pike perch, but fishermen seem to pay no attention to it, clinging to the old name, pike. This is entirely incorrect, as the fish does not belong to the pike but to the perch family, as can readily be seen by comparing the two in the illustrations. The most noticeable difference is that the pike has one dorsal fin, while the pike perch has two. Its general color is lighter and brighter, with yellow splashes running in all directions. Its head is much shorter, and the body much larger in diameter—in fact, there is no comparison to be made between them in general outline, color, or appearance.

The pike perch spawn in April and May, and are very prolific, a medium-sized fish yielding from 100,000 to 200,000 eggs. They hatch out in about fifteen days, and the fry grow rapidly. They are

decidedly a game fish, being hard, lusty fighters when hooked. Feeding almost entirely on other live fish, and being generally caught on marl, sand, or gravel bottom, they are unquestionably a clean fish, and a highly prized one for the table, ranking about equal with the whitefish and lake trout.

It is a very difficult matter to locate these fish when angling for them, as they are very migratory, constantly moving about—one day in shallow water 6 to 10 feet deep, and the next in water 40 to 60 feet deep. They vary considerably in weight. In the smaller lakes and rivers they average from 2 to 6 pounds, with an occasional one of 8 or 10 pounds. In the large lakes 10 to 20 pounds, and even 25 pounds, are common. They are caught all through the open season, biting seemingly as well at one time as another. Large numbers are taken through the ice, and they will take live bait on a set line better at night than during the day—in fact, they can be caught by angling after dark long after all other game fish have ceased biting.

Some of the State Fish Commissions, notably that of New York, long since recognized the value of the pike perch both as a game and a food fish, and have been artificially hatching them. For several years they did not have the success met with in other fish, but many difficulties have been overcome, and

great quantities of fry are now being hatched and planted each year.

Of the four fish mentioned in this chapter, the pike perch appeals most strongly to the fisherman. While not as large, and consequently not as hard a fighter as the muskallunge, it is more plentiful. As fighters, the pike and pickerel should not be placed in the same class with the others. While undoubtedly game in a measure, they do not bear comparison. For all-round satisfaction to the angler in the way of sport, fighting qualities, number caught, and value for food, the best of the four is the pike perch.

CHAPTER VII

MISCELLANEOUS FRESH-WATER FISH



Still fishing.

WITH the description of the pike family, the list of so-called game fish is practically completed, that is, so far as fresh-water fishes are in question. There are many

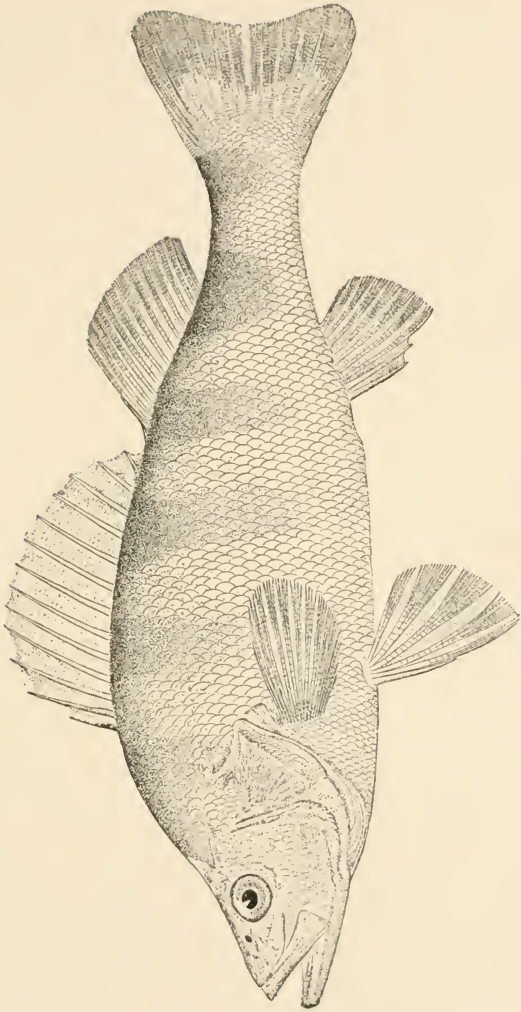
other varieties worthy of mention that anglers frequently seek, and which are often taken when one is angling for other fish. Some of these are particularly hard fighters, and may well be considered as game, even though but little attention is paid to them by Fish Commissions or fishermen generally.

The list of what might be called ordinary fishes consists of the following: yellow perch, white perch, carp, both scale and leather back, bullheads and catfish, sheepshead or drum, and ling. The two latter varieties afford great sport to the angler, as, when hooked, they fight constantly and to the very last. While all are more or less widely distributed and well

known, the perches, carps, bullheads and catfish are especially so, and are much sought after.

The yellow perch, sometimes known as the ringed perch and striped perch, is one of the very best known fresh-water fish in this country, being found in all of the States east of the Alleghany Mountains and as far south as Georgia. They also inhabit the Great Lakes, and some of the northern rivers and lakes as far west as Minnesota. While they are taken in both lakes and rivers, their natural home is in the former, and there they are found most plentifully. Perch are most strikingly marked, and will attract especial attention, even when surrounded by many other fishes. The body color is a bright golden yellow, the back a decided greenish bronze, with a yellowish white belly. Six or eight black colored bars fully half an inch wide extend from the back midway down the sides. The lower fins are bright red or orange, very similar to those of the brook trout, while the dorsal fins and tail are green. The back, from the head to the dorsal fin, is arched or hump-backed, rather detracting from their appearance. They are properly a small fish and are usually taken about 8 to 10 inches long, with an average of about $\frac{3}{4}$ of a pound in weight. In some waters particularly adapted to their growth they have been known to reach 2 pounds.

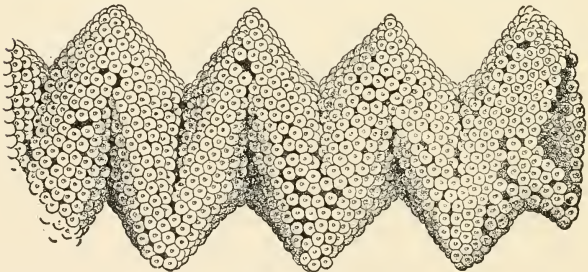
Perch, when skinned, make a most excellent pan



Yellow Perch.

fish, the flavor being very fine. This is due to the fact that they usually subsist on live food. They are found at different depths according to the season, varying from 5 or 6 feet to 15 or 20 feet, generally being taken upon gravel or stony bottoms in the vicinity of weeds. They take the hook readily, and, as large numbers can be caught, are a great favorite with anglers. The perch can not be equaled as a pan fish, when skinned and properly cooked.

Perch have been propagated by the United States Fish Commission, and transplanted to the waters of the extreme Western States with great success. The method of propagation is different from that followed in the case of other fish. The eggs are neither arti-

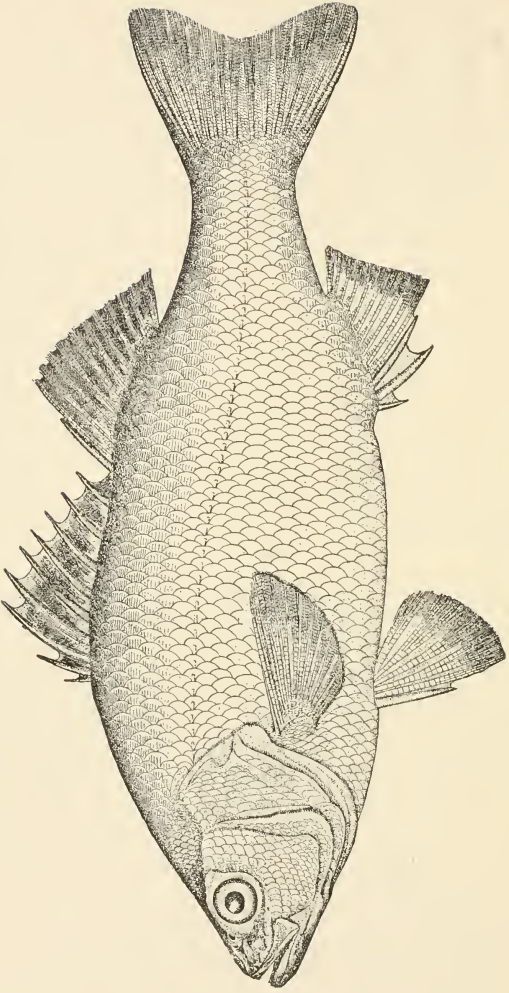


Yellow Perch eggs.

ficially taken nor impregnated, but the ripe fish are placed in ponds, and the naturally impregnated eggs taken and hatched artificially. The fish being so generally abundant and the natural supply seeming

to increase rather than diminish, but little propagation is now required. The naturally fertilized eggs are very remarkable, as, when deposited, they remain in a long strip, having vertical folds like those of an accordion, and can be compressed in a similar way. The strip rapidly becomes longer and frequently reaches a length of from 2 to 6 feet, a size many times longer than the fish that deposited it. The spawning season is in March and April, but the perch are not protected by law at any time.

Another fish, that is always a favorite in its home waters, is the white perch, which, by the way, is not at all related to the yellow perch. Properly a salt-water fish, they are usually found in brackish or fresh waters, about the time the shad ascend the rivers to spawn. They are taken only in rivers that flow into the sea, and are found from South Carolina to Nova Scotia. They lurk about clay or muddy bottoms early in the season, but a little later are found near weeds or rocks and old stone and wooden piers. The date of their departure to the sea is unknown. While not a large fish, their quality is good, as is that of the yellow variety, and they make just as fine a pan fish. In shape this perch is very similar to the black bass; its color is a silvery white without any noteworthy markings. It is shorter and wider than the yellow perch, weighing practically the same

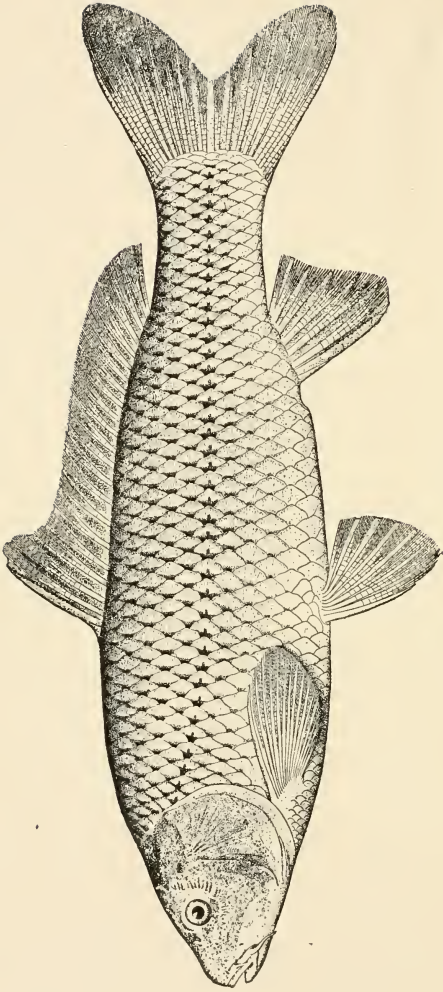


White Perch.

—about $\frac{3}{4}$ of a pound. Where it is found no similar fish will be taken, so that it will be recognized at sight. It is not propagated artificially. A most noted river for white perch is the Potomac, in which immense numbers are taken annually.

The carps, which are related to the American fishes called suckers, have become quite plentiful all through the States, and should be familiar to all anglers. They are native to China, but were brought to this country originally from Germany, the first shipment, amounting to some three hundred and fifty young fish, arriving in 1877. That they have become so plentiful from such a small beginning, and in such a short time, indicates that they are very prolific. In fact, one weighing from 4 to 5 pounds will contain between 400,000 and 500,000 eggs. There are three varieties of carp, known as the scale carp, mirror carp, and leather-back carp, the first and last varieties only being found in this country.

The scale carp is the original form, and, as the name indicates, its body is covered with scales. The mirror carp is a species with three or four rows of extraordinarily large, bright scales running along the sides, the balance of the body being covered with skin free of scales. The leather-back has usually a few coarse scales along the back, or none at all, and is covered by a quite thick skin. The color of all is brown,

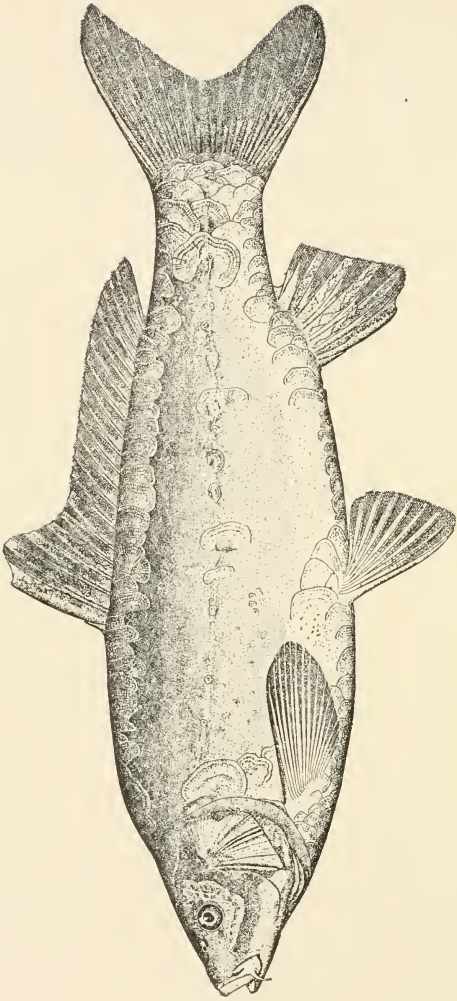


Scale Carp.

with an olive shade, the belly being white, orange, or yellow. Like the sucker family, they have no teeth in the jaw, showing that they do not prey upon other fish. Their food consists of vegetation, offal, seeds, worms, swill—in fact, almost anything, with a strong desire for the eggs of other fish.

It is a grave mistake to place carp in confined ponds with fish of any value whatever. While they do not attack the fish themselves, as just stated, they do devour their eggs to such an extent that they will eventually destroy them entirely. In this regard they show their similarity to all other bottom fish—they are egg or spawn destroyers. While naturally a pond or dead-water fish, carp are often taken in rivers and lakes, but simply because they can find there the quiet bays and muddy bottom they require. There is no question but that the carp can live in waters where no other food fish are able to exist. They thrive splendidly in muddy ponds and slough holes, and will live in small holes filled with water when left there after the overflow of a stream. They are also distinctly a hibernating fish, large numbers of them banding together and filling holes they excavate in the mud, where they will lie semi-dormant without eating from October to March.

The carps grow very fast, attaining a weight of from 3 to 4 pounds in three years. They have grown



Leather-back Carp.

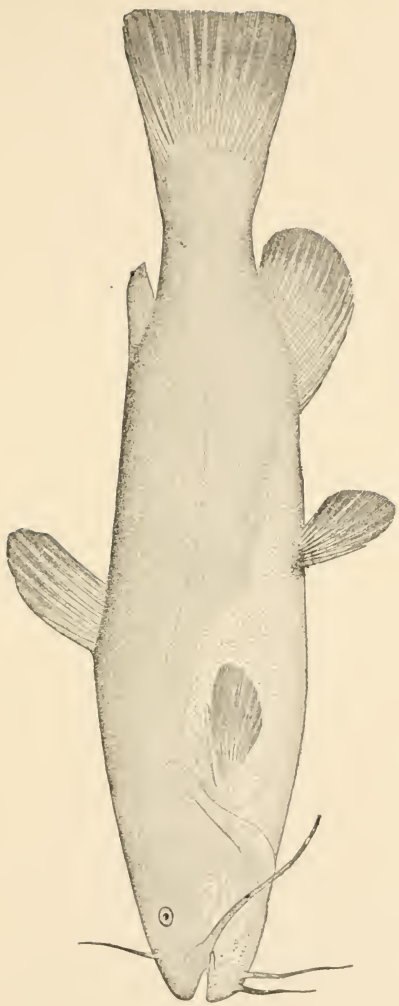
so rapidly in America, wherever planted, that they can now be taken in almost any waters in the Eastern, Middle, and Southern States. While averaging small, about 3 to 8 pounds, they are occasionally taken of from 15 to 25 pounds. In Germany carp of 50 pounds and over have been caught.

Of the bullheads or catfish we have numerous species, there being very little distinction or difference between them, except in size. All have the numerous long horns about the mouth, and the long, sharp spines at the front of the dorsal and pectoral fins. They are the most abundant fish found, occupying all fresh waters east of the Rocky Mountains naturally. The whole family are voracious and indiscriminate feeders, eating any kind of animal substance, dead or alive, and are especially destructive to fish eggs. They are extremely tenacious of life, living for a very long time out of water, and are able to resist impurities in the water far better than any of our food fish. For stocking muddy bottom ponds in which trout, bass, and other fish would not live, the catfish or bullhead are especially adapted. Any water that does not dry up entirely to the bottom in summer suits them.

There are several varieties of catfish, ranging from the common channel cat, weighing from 5 to 10 pounds, to the Great-Lakes species, ranging from 50 to 100 pounds, and the well-known great Mississippi

cat, which reaches a weight of 150 pounds. They are practically much alike in appearance, with very few marks to distinguish them one from another. The most common variety are known as bullheads, or bull pouts, and are found in all waters. They never exceed 3 or 4 pounds in weight, and are usually much smaller. All varieties are decidedly a night-biting fish, being generally caught at dusk or after dark. It is scarcely necessary to state that this family has a skin, not scales. The best as food fish are the channel cats, which are slender in form and silvery in color, while those next in value are called bullheads and are mostly dark-colored and chunky.

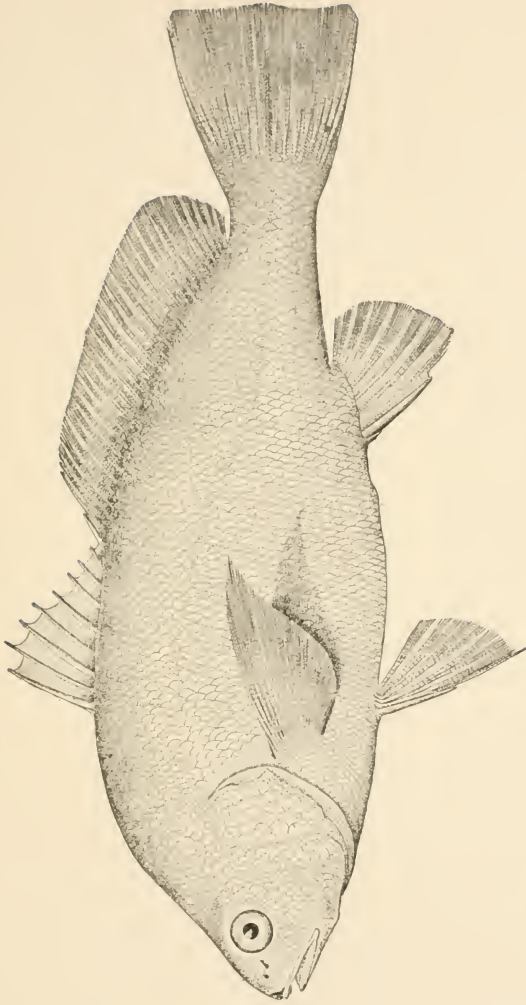
The fresh-water sheephead, or drum, is also a very commonly distributed fish, being found in all large bodies of water, either lakes or rivers, from the Great Lakes in the north to the Rio Grande in the south. Properly a bottom fish, they range from 1 or 2 to 40 or 60 pounds in weight. In shape they are somewhat similar to a black bass, but decidedly humpbacked; their color is a silvery white. The second dorsal fin is much longer, almost reaching the tail, and the nose is very blunt, the upper jaw overhanging the lower. The mouth is smaller than that of the bass. They make a peculiar grunting or croaking noise, which gives them the name of drum. They will often follow under a boat for some



Catfish.

distance, constantly emitting the sound quite loudly. A double air bladder connected by a narrow passage is supposed to produce this peculiar noise, the air being forced from one part to another. An especially hard-fighting fish when hooked, the drum gives one a long tussle, and tests tackle as well. It is not very often taken when angling, but those who have caught both sheepshead and bass will prefer the former, principally because they are just as hard fighters, and, having more weight, take a longer time and are more difficult to bring to net.

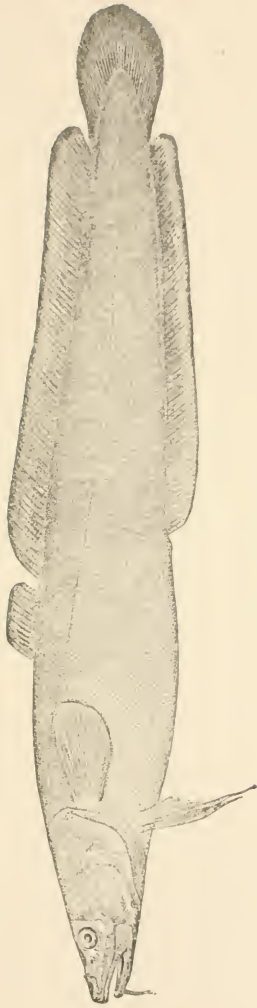
Very peculiar and far from attractive fish are the burbots, or fresh-water cods, which are found in the lakes and rivers of the Northern States, and as far north as the Arctic circle. Often called "cusks," they are known in New England as the "eel pout," in New York as the "ling," or "lawyer," and under many other names in various sections. A most voracious bottom fish, they feed principally on small fish, and often on any dead fish or animal. In appearance they somewhat resemble both the bullhead and the eel. They have nothing about them to attract an angler, except their fighting qualities. One peculiarity they possess, and that is, they almost always bite at night, generally after dark. They are most frequently taken during the night, on set lines placed quite deep. Occasionally fishermen catch



Fresh-water Sheephead.

them when angling for other fish with minnows for bait. When they take the hook, a wonderful fight follows. They twist and squirm, running here and there, and will easily jump out of the boat if not killed at once. In lakes they are taken through the ice in large quantities, and it is great sport to get them through the small fishing hole. Though they are not spoken of highly as a food fish, their flavor is good. When dried and salted, as are salt-water cod, their flesh is claimed to be almost fully as good. In weight they range from 2 to 4 pounds, but in some of the larger lakes specimens weighing up to 40 pounds have been taken.

Before concluding this chapter on miscellaneous fishes it is well to give passing mention to the sucker family. There are many species, but all are too coarse or dry fleshed to be of any commercial value as food fish. All are large scaled, ugly in contour, lifeless, soft fleshed, and full of bones. Every lake, river, and stream is full of them, therefore they are very frequently caught in angling for other fish. Ordinarily, suckers are only good to throw back, not being of any value as food fish, for the reasons just given. There is one exception, however, that when taken from cold streams in April and early May, they are firm fleshed and quite palatable. They are a very bony fish, but most of the bones can be avoided by



Burbot.

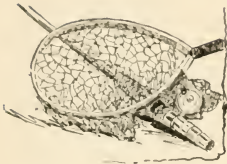
cutting off the tail portion, which contains the greater quantity, just ahead of the anal fin.

Another useless fish and a great nuisance is the chub. Every angler who has faithfully fished a trout stream, eagerly expecting a trout from every promising pool, can vouch for their lack of value, except to clean his hook of bait, and prevent success. There are so many kinds known under such varying names that, as they are practically valueless, it would be absolutely useless to attempt in any way to describe them. The only value ever to be found in them is that they afford unlimited food for other fish, and always help to fill out the small boy's first few strings.

There are a few fish purposely omitted from the foregoing chapters. They are either species of those described, the same fish under varying names, or some local fish generally unknown and not worthy of mention. The varieties of which descriptions have been given comprise the best-known and most sought-after fresh-water game and food fishes. It was impossible to give all of the many various local names applied to the same fish throughout the country, but the detailed description of each fish, and the accompanying illustrations of it, should enable the angler to determine quickly and correctly the name and character of what good fortune has brought to his hook and net.

CHAPTER VIII

FISHING TACKLE—WHAT TO SELECT



Necessary tackle.

STUDY and practice will give the skill that makes a successful fisherman, but the greatest necessity is to have a proper outfit of tackle, and a thorough knowledge of how and when to use it. Therefore, before attempting to explain the methods of catching the various kinds of fish described in the preceding chapters, it will be well to explain fully the angler's outfit. This subject being made clear, any reference to the different items mentioned will be readily understood.

The term "fishing tackle" covers all the various and numerous things used and required in catching fish. The items of rods, reels, lines, and hooks alone do not complete the list—in fact, they are but a beginning. Numerous small things must be provided, for the absence of a single one of them may prevent a day's fishing.

Among anglers there are many varied opinions, or, more properly speaking, preferences as to what particular tackle is best. Under such conditions it is better to refer to the various kinds, all of which are good, and to give individual reasons why any particular one is preferred. There is one thing that all fishermen will agree upon, and that is that the beginner should start in with good but inexpensive rods. It is much better and easier to replace a low-priced rod, broken through inexperience, than an expensive one that only an experienced hand should use. On the other hand, inexperience requires just as fine qualities of lines, leaders, hooks, and reels as does experience. When a rod is broken a fish does not necessarily get away, but when a line or hook breaks, it does. With tackle, as with all other things, the best is the cheapest in the end, except in the case of delicate, expensive rods, which should only be used when practice has made perfect.

Naturally the subject of rods is of the greatest importance, and therefore should be mentioned first. The sizes, weights, and varieties are innumerable, and, in reality, worthy of a chapter to themselves. In some respects, especially in salmon and heavy trout rods, the English makers excel Americans, but for light- or medium-weight delicate creations, they can not even approach us. The woods best

adapted for fishing-rod purposes are bamboo, greenheart, bethabara, and lancewood, and at the same time should be mentioned the latest creation, the steel rod. Although all of the woods referred to are used in England, greenheart and lancewood are the especial favorites. The English makers do use ferrules in making their joints, but they much prefer the wound joint as being stronger, inasmuch as it bends equally with the rod. There is no question but that such a joint has its advantages, the one disadvantage being the length of time it takes to wind or unwind it. An English salmon rod of greenheart with wound joints is absolutely the best rod to be had for the purpose, lasting a lifetime; and this is true also of their other rods of ten ounces and heavier.

Anglers to-day demand light rods, either for fly or bait fishing, and for trolling as well. Four to eight ounces for fly casting, eight to ten ounces for bait fishing and trolling, are the weights usually called for. Split bamboo is the favorite wood, with bethabara next, and lancewood and greenheart following. Split bamboo rods can be bought at all prices, ranging from a cheap machine-made article at \$1.50 to the finest hand-made at \$45. While excellent rods of this kind which have lasted for years, have been bought at a low price; to secure absolute satisfaction one must pay at least \$15 to \$25. Split

bamboo rods need the greatest care and attention. Being made of strips—usually six—cemented together and varnished, they will spread apart, twist, and break if exposed to continued dampness or wet.

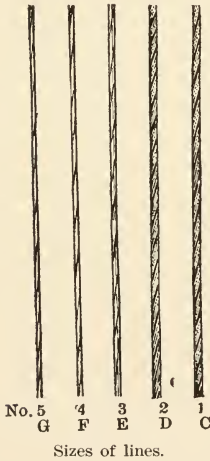
Bethabara is next in cost to the split bamboo, and will range from \$6 to \$12. By many it is preferred to bamboo. Lancewood and greenheart will average from \$2 to \$8. Steel rods can be bought at prices ranging from \$4 to \$12.

Fly fishing is something to be taken up when all other fishing methods have been learned; therefore a fly rod is the last thing to be purchased. For the beginner a good lancewood rod, weighing from eight to ten ounces and costing \$3 to \$5, is probably the best one to procure. It is adapted to all kinds of fishing, and will stand considerable strain without breaking. If an English or Nova Scotia rod with wound instead of ferrule joints is preferred, greenheart will probably prove to be the most suitable. However, the question of rods is a debatable one, owing to the many and varied opinions held regarding them. Perhaps it is better, therefore, to rest upon the hints given above, and leave the matter of selection to individual preference, aided by the advice of some fisherman. When the rudiments of fishing are once learned the selection of rods becomes entirely a question of personal preference.

There are so many varieties of reels, each having numberless admirers, that to advocate any special kind would provoke discussion at once. It may be more to the point, in consequence, to give a personal preference and the reasons therefor. For all-round satisfactory results an automatic or self-winding reel is the best, and should be adopted in the beginning and always used. To handle such a reel properly, practice is required, which can only be obtained by constant use. With other than game fish, this reel is not a necessity but a convenience, while with game fish that fight hard, rushing hither and thither, it will bring more safely to net than any other. The secret of capturing fish is to avoid absolutely giving them any slack line whatever. If they make a mad rush, unwinding a large quantity of line, the drag on an ordinary reel scarcely serves as a check. With the automatic, however, the pulling out of line winds a spring, which makes the tension a gradually increasing one, thus quickly tiring and checking the fish. The next rush may be directly toward the fisherman, slack being given so rapidly that a crank reel, no matter how much it multiplies, can not recover it fast enough, the result being that if the fish again turns and rushes away it will have enough slack line to secure a good start, and to fetch up with a jerk that will tear out the hook when the line again becomes

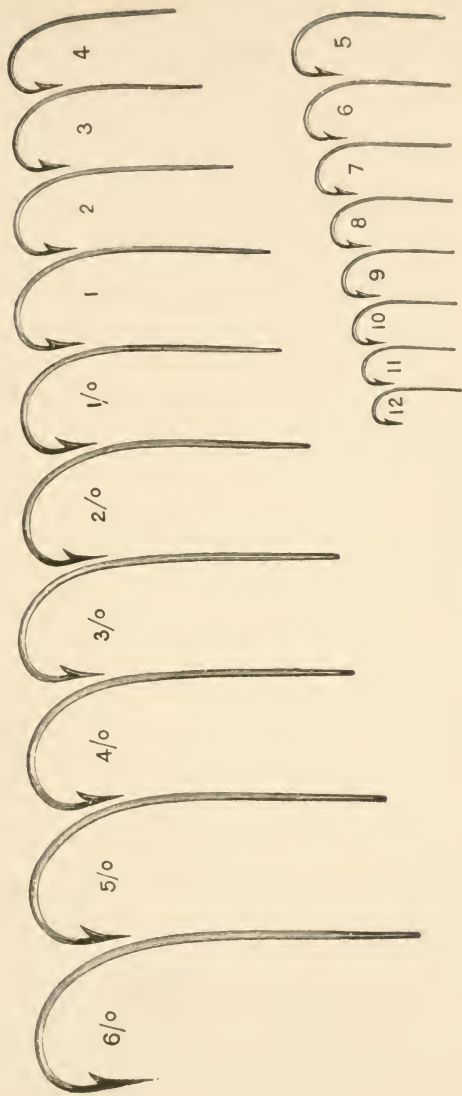
tight. With the automatic reel, properly handled, this can not occur.

When a fish is hooked the brake is released, and the tension of the spring is constantly pulling on the fish to help tire it out. If a rush is made toward the fisherman the spring winds up the slack as rapidly as it is given, and in no way possible can the fish get any free line to tighten up and tear loose. It is a difficult matter at best to handle a hard-fighting fish, consequently the aid of an automatic reel is of great benefit. There are many makes of multiplying



crank reels that are most excellent, and those who prefer them will find an infinite variety at any price they may choose to pay. The automatic is advocated from an absolute belief in its merits. A good crank reel will give perfect satisfaction, but it can not take in the line as rapidly.

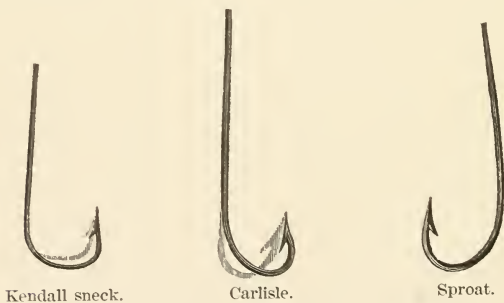
There certainly can not be any question as to what quality of line to use, since all anglers agree upon that subject. Braided silk is proper, and an enameled one is the best. It is pliable, thoroughly waterproof, and with good care should last many years. No



Sizes of hooks.

breakages can occur with its use. For ordinary bait fishing, a C or D size serves all purposes, but a lighter one is better adapted for fly fishing, as will be shown later on. For any fishing except salmon, twenty-five or thirty yards of line are amply sufficient, especially with the automatic reel, which checks a fish from running it all out. For trolling, a No. 1 braided linen grass-colored line will be found most satisfactory.

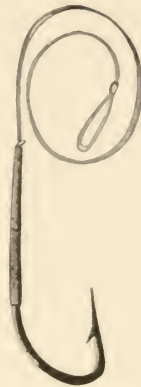
The subject of hooks is one that should be carefully studied and most thoroughly understood. Every angler has his own ideas as to sizes and kinds for various fish, which renders it difficult to make recommendations that others will agree with. Suggestions will be given on this point in succeeding



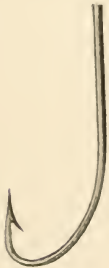
chapters, where the methods of catching various kinds of fish are discussed. In the accompanying illustrations the various sizes of hooks are shown,

and the different patterns or bends. Snelled hooks only are now used, and one should have a variety of sizes ranging from large with wire, gimp, or double gut, to small with a fine single snell. Trolling spoons and small spinners for trolling or casting are very necessary.

Of vital importance to the angler is a landing net, which should be taken along on all fishing trips. Without it a large number of fish will be lost in attempting to lift them from the water by the hook. There are many kinds, nearly all of which have merit, and a good one can be easily selected. It is



Snell hook.



Limerick.



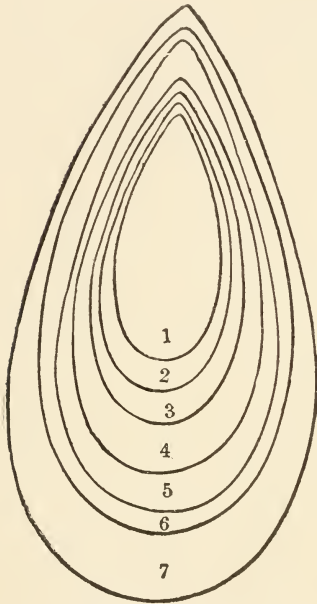
Kirby.



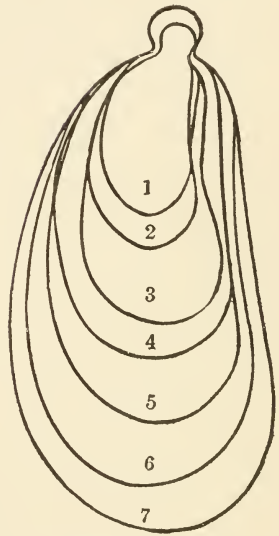
Aberdeen.

well, however, to advise the purchase of one of large size, with a handle fully four or five feet long, which can be quickly put together or taken apart.

The foregoing describes the tackle principally required by the fisherman. There are many other



Sizes of oval spoons.

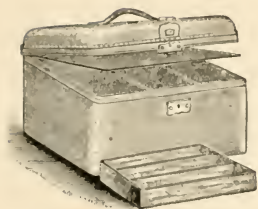


Sizes of kidney spoons.

articles fully as necessary that must be mentioned in detail, and to their description the following chapter is devoted.

CHAPTER IX

THE TACKLE BOX AND ITS CONTENTS



Tackle box.

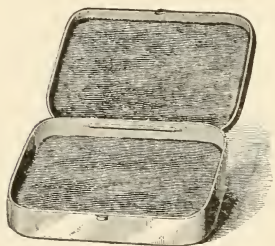
A GOOD fisherman must have a tackle box; there is no question in regard to that. Whether it be homemade, a cheap or medium priced one of tin, or a more expensive one of leather, it is an absolute necessity. There is no

other way of carrying compactly the many things required by an angler so that they can be found at once, and used when required. Little things that are needed constantly are easily lost if carried in a fishing basket or one's pockets.

Such boxes of tin or leather can be purchased at almost any price, and are properly arranged to hold a large quantity of necessaries, a list of which is given here. Fly book, hook book, leader box, fish scale, copper wire, pliers, sinkers, cork floats, swivels, drinking cup, twine, needles, linen thread, silk thread,

a set of tools contained in their handle, compass, small oiler and oil, large hook for gaff, file, and knife, extra lines, hooks, spoons, spinners, cartridges for revolver or rifle, corkscrew, and can opener.

The fly book will hold the necessary flies, and extra leaders as well. A long hook book is needed to carry snelled hooks, keeping the various sizes separate, with gut held straight. Unless arranged in some such way, the long snells become twisted and tangled together, making it difficult to secure one



Felt-lined leader box.

when wanted. The cost of such a book is very small, but a good fly book calls for considerable expense.

A round or square zinc leader box containing felt pads is needed to dampen leaders prior to their use.

They are always coiled when not being used, and unless kept moist, will grow very dry, requiring considerable time to straighten out again. It should be noted, however, that they must be kept in the leader box only a short time before and during use. On returning from his trip, the fisherman must immediately take them out, dry them, and keep them in his fly book. If he does not do this, the dampness will soon rot them. A

small fisherman's spring scale, weighing up to 8 or 10 pounds, will be especially appreciated, as the correct, not guess weight, of fish can always be taken.

Some small spools of copper wire, one each of Nos. 18, 20, and 22, are especially needed, and of great service. Not only can almost anything be mended with these when broken, but they are used in trolling as well. A pair of small steel pliers with a cutting attachment is very often found useful. An assortment of lead sinkers, including split shot, will be used in almost all kinds of fishing, and a good quantity should be carried at all times. One or two cork floats are needed occasionally in fishing, and should be included. In trolling, swivels are always necessary. A few, from No. 1 to No. 8 assorted, will prove sufficient.

A reliable compass is always serviceable and should be carried in the box. Oil is another necessity, and a small bottle, together with a pocket oiler that does not leak, will be required very often. For repairing any breakage (and such things constantly occur), a set of small tools, contained in a handle which they fit when used, is not only a convenience, but an absolute necessity. These, together with a knife, a five-inch triangular file, and a spool of red silk thread, furnish all that is required to repair a broken rod. There are innumerable uses for a file

in sharpening hooks or arranging spoons and other special tackle.

For repairs on torn clothing, needles and strong thread should find a place in the tackle box, and a telescope drinking cup in a case should not be forgotten. A skein or two of heavy cotton line can be used for an anchor rope, to tie packages, string fish, fasten a boat to a buoy, stay a tent—in fact, it will come very handy for innumerable uses. Do not omit this.

There are various other little items that, while not absolutely necessary, may come into convenient use at times. Individual experience will suggest these, as mention has only been made of items that should absolutely be on hand. One thing has been omitted that should not be, and that is



Telescope drinking cup and case.

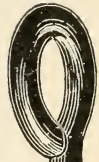
the tackle box, and a telescope drinking cup in a case should not be forgotten. A skein or two of heavy cotton line can be used for an anchor rope, to tie packages, string fish, fasten a boat to a buoy, stay a tent—in fact, it will come very handy for in-

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2/0 Cod hook.



a 2/0 cod hook to use as a gaff on large fish. Filed to a sharp point, and tied to a short stick, it serves the purpose fully as well as an expensive gaff.

A tackle box will not only contain all the items mentioned, but have ample room for one or two reels holding the lines as well. Therefore, all things necessary to go fishing, excepting rods and net, are contained in a small compass where they can not be lost and are always accessible.

Other necessities in an angler's outfit are a bait box for worms, a minnow pail to carry live minnows, and a fish basket to use when stream fishing. Be careful to secure a basket having a top opening through which to drop fish on the side, not in the middle, as it will be found more convenient. Always use a patent sling strap, as it holds the basket immovably under the left arm. A final convenience to men-



Fish basket.



Rod case.

tion, but which is not absolutely necessary, is a rod case. It should be sufficiently large to contain two or three rods and the landing net. Made strongly

of leather, it prevents injury to the rods, protects them from rain and dampness, and makes a most convenient method of carrying them.

With the tackle box containing all the smaller necessities, and the rod case having the rods and net, one can simply pick up both at a moment's notice, and is then prepared for any kind of a fishing trip. In this connection a word of warning should be given. Always dry out a rod thoroughly after using and before placing it in either the cloth or leather case. Nothing will injure a good rod so quickly as to put it away damp.

This discussion of the tackle box suggests mention of something that while not a material part of its contents, is closely connected therewith—namely, a knowledge of how to tie gut in both leaders and hooks when broken. Every fisherman should know this.

There are various methods, but the simplest and best one serves all purposes and will suffice. It consists simply in making a loop on the end of the gut that can not slip or loosen. In the case of a broken leader, after testing the pieces for strength, a loop is tied on each broken end, one slipped over the other, the whole length of the one slipped over being drawn through the other loop. In case of a loop breaking on a snell hook, another one is quickly made by this

method. By closely noting the illustrations and the following explanations, no difficulty will be found in learning to tie the knot.

A loop is first formed by bringing the end around to the right and then to the left, under and once about the gut, a simple single sliding knot being thus made.

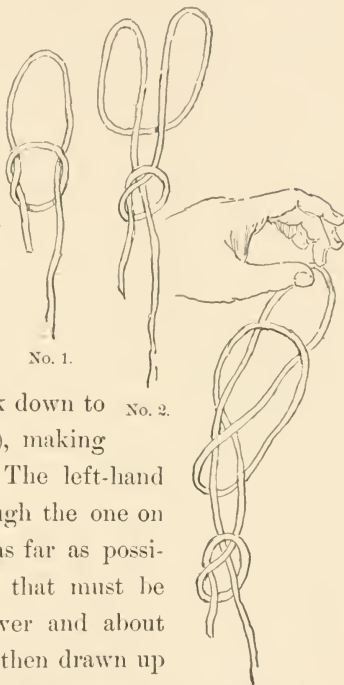
A loop about $\frac{3}{4}$ of an inch long should be allowed. The top of

the loop is then bent back down to the knot (see illustration), making

two loops side by side. The left-hand loop is then passed through the one on the right and drawn out as far as possible. This forms a knot that must be

arranged to be slipped over and about the first knot tied. It is then drawn up tight, a fastening being formed that can

not slip. Before drawing the final knot tight, the loop can be made of the exact size wanted. But little practice is required to tie this loop when once learned. Do not reverse the order or vary from the explanation given in any way.



No. 1.

No. 2.

No. 3.

Tying gut.

CHAPTER X

FLY FISHING



A well-tied fly.

THERE are innumerable methods of fishing, and often many ways of catching the same variety of fish, some of which call for a great amount of skill that only experience can give. The greatest of all, where skill and accuracy both are necessary, and which can be acquired only by long and constant labor, is to fish with the fly. It is the most graceful method of fishing, and the most difficult as well. With but little practice, under a good tutor, a fly can be cast in a way and fish caught. Unfortunately, many fishermen are content with such a limited knowledge, believing that they know all regarding this most skillful form of the sport, whereas, in reality, they have scarcely mastered its rudiments.

First of all, to understand fly fishing one must

know much of the habits of fish, and especially of their natural food, so far, at least, as their liking for flies and insects is in question. Then, a knowledge of what particular flies are seasonable during different months of the year is necessary. A certain fly used in its proper season is much more effective than out of season, although the rule is not at all iron-clad. This is preliminary, but of great advantage to know.

The next important step in order is the selection of a proper rod. The general consensus of opinion is that one made of split bamboo is by far the best, and it is. For the beginner, however, a rod of lancewood, bethabara, or greenheart—not too light, perhaps seven or eight ounces in weight—is the proper one to learn and practice with. Such a rod will stand much hard usage, and, being inexpensive, entails but little loss if broken. A better and lighter rod can be got when experience warrants.

An enameled silk line, No. D or E, is properly adapted to fly fishing, the former probably being the better for a beginner, as it is heavier. For an experienced fisherman, however, E is generally the favorite size, a tapered line allowing of better and more accurate casting. Any reel can be used, but if the automatic is to be adopted, practice should be commenced with it. When learning or prac-

ting casting, use the line only, without flies or leader.

Properly to cast a fly, the forearm and wrist only are used, and, in reality, the upper arm could be fastened to the side without interfering with the work. The first endeavor of an amateur is to try to cast to a distance. Since at first accuracy is of the greatest importance and distance of far less, the former should be practiced only. The effort to throw a line to a distance without knowing how will cause the beginner to use the full strength of his arm and to acquire a habit that will be most difficult to break off, if it can be overcome at all.

As stated, fly casting is done entirely with the forearm and wrist, and with the expenditure of but little, if any, energy. When once learned it can be kept up for hours without tiring the arm to any extent. The whole secret of expertness is to learn just when, on the throw-back, the line is out perfectly straight before recovering and making the forward cast. This can not be taught, and can only be learned by careful practice. At last one seems to know instinctively when to recover, and the secret is learned. It is far better to cast twenty or twenty-five feet of line accurately than a far greater length without being able to control the direction absolutely. More fish will be taken generally within thirty feet,

than over that distance. Occasionally a pool can not be approached closely, and a long line must be thrown, but distance is easily acquired—in fact, it comes naturally in practice.

The late Reuben Wood, of Syracuse, N. Y., was without question the finest fly caster of his day, and he always had set rules that his pupils must follow. He invariably tied a beginner's upper arm to his side, making him cast in that way, until, when free, the arm was kept against the side naturally. Another rule, and a good one, was that for a considerable length of time he would only allow a line twice the length of the rod to be thrown. A chip of wood was tossed upon the water, and all effort must be made to drop the line over it. Eventually the line was lengthened and casts to a greater distance made, but accuracy must keep pace, and especial attention was paid to dropping the cast lightly upon the water.

When the line has become straightened out behind, the forward cast should be made with a sharp, steady throw of the rod—never with a jerk. The point of the rod naturally drops, and if it is held in this position until the cast strikes the water the leader and flies will generally drop in circular form. To avoid this and have the leader fall gently and in a straight line, the point of the rod should be elevated three or four feet just at the moment the cast

is about to strike. This causes just enough drawing back of the line to straighten it out to its full length. The flies are then drawn through the water until the rod is upright, whereupon the cast is repeated.

If a fish strikes a fly when the leader is loosely coiled upon the water, it is not liable to get hooked, in which event it is not probable that it will strike again. When the leader is dropped straight, there is every chance of hooking the fish. It is well to know also that in casting up stream, the line must be drawn back and re-cast very quickly. If this is not done, the current slackens the line, preventing a strike if a fish rises, and preventing another cast, unless by reeling in and starting anew.

It should always be remembered that if a fish should rise to the flies within six or eight feet of one's boat, one must never strike it, as it will almost invariably break a rod. Avoid the temptation by never having the flies so near. In drawing the flies upon the water every effort should be made to imitate a natural movement. If a short line is being cast, a slight shaking of the rod in drawing will cause them to flutter. In the case of a long cast, short jerks will bring about the same result. As the natural action of a fly is being imitated, it will be seen at once how necessary it is to drop the leader and flies delicately upon the water. If they are

thrown roughly, with a splash, the fish are frightened away.

The use of very large flies is a grievous mistake, and experienced anglers discarded them long since. A fly tied on a No. 4 or 5 hook will be found sufficiently large even for salmon, and only occasionally will a No. 2 or 3 be required. For small fish, No. 8 will be found small enough. Medium or small flies will attract fish when large ones will not, and will hook them more securely. A six-foot leader will prove much more satisfactory and convenient than a shorter or longer one. Loop leaders are preferable to those tied with knots, as they allow flies to be changed easier and much more quickly.

Concerning the particular flies to be used it can be said that, aside from several that are considered standard and always good, it is as well to leave the selection of any others to personal choice. In some localities certain flies are considered absolutely necessary, that elsewhere would prove to be useless. Knowledge of such conditions must govern the selection also. In all parts of the country and for all fish the following flies will be found to be standard and favorites as well: Jock Scott, Silver Doctor, Coachman, Professor, Queen of the Waters, Parmacheene Belle, Montreal, Reuben Wood, Ferguson, and Brown Hackle.

This list gives almost enough variety, and all mentioned should be carried. If others are desired to provide for any emergency there are numberless kinds to select from. At times only a special fly will attract fish, and at others almost any one, no matter how odd, will prove to be especially good.

There is one bit of advice in reference to rods that properly can be given here. It is a strong temptation to have a large number, and to carry several on a trip to the woods or elsewhere, when the amount of baggage to be carried should be made as small as possible. Naturally one will say that there is always a great possibility of rods being broken, and that it is necessary to have others to replace them. The best plan to follow is to have a special rod made, consisting of one butt, two second joints, and three or four tips. A tip is often broken, a second joint occasionally, a butt rarely; therefore, a rod of this description is in reality equal to two. This does away with the necessity of carrying an extra one.

For an expert angler, the weight of his rod must be a matter of choice guided by his own experience, but a word of advice to others is needed. There is a strong tendency to select the two extremes—either too light or too heavy—both of which should be avoided. A light rod of three or four ounces, while it will bring a fish to net, requires enough labor and

worry to tire the fisherman quickly. If too heavy—ten ounces or over—it is too stiff to cast a line properly, and will not give a hard-fighting fish the spring necessary to handle it well.

Experience will teach that a rod of 6, 6½, or 7 ounces is just correct. It is light and springy enough to cast out a long line, and to handle and tire a fish easily as well. These weights are too light, however, for an inexperienced hand.

It is advisable to have for reference a list of standard flies from which a selection can be made when required. While the small variety previously mentioned is, as stated, ordinarily sufficient, others may be needed at times. The fly fisherman should become familiar with the names, and as far as possible with the flies themselves, in order to distinguish them. The list following, while it does not give the names of all flies made, will be found to cover the best known and most successful.

Reuben Wood,	Jungle Cock,	Abbey,
Seth Green,	Black Hackle,	Yellow Sally,
Scarlet Ibis,	Brown Hackle,	Gov. Alvord,
White Miller.	Queen of the Waters,	Silver Doctor,
Coachman,	Beaver Kill,	John Mann,
Green Drake,	Cow Dung,	McCarthy Ouananiche,
Ferguson,	Professor,	Hares Ear,
Montreal,	Baltimore,	Brown Palmer,
March Brown,	Bucktail,	Parmacheene Belle,
Grizzly King,	Royal Coachman,	Jock Scott.

The subject of fly casting is a most difficult one to explain ; therefore, practical hints only can be given. To become a successful fly caster, constant careful practice is absolutely necessary. One must discover his own faults and correct them at once. As advised, accuracy is the first and most important rule to follow ; it is absolutely necessary—so much so, that immediate success can not be obtained unless it is achieved. Delicacy ranks next, and it is almost equally important. Accuracy drops a fly where a fish has just risen, delicacy avoids frightening it, and attracts it. Distance is necessary at times, but that comes in due course, when the other requirements have been mastered.

CHAPTER XI

HOW TO CATCH SALMON AND TROUT



Salmon leaping a fall.

UNFORTUNATELY, the opportunities to seek salmon fishing are very limited. This is because all the fishing rights on both American and easily accessible Canadian rivers have been leased either by individuals or clubs. Unless one can secure an invitation

to fish such waters as a guest, or seeks the rivers on the northern coast of the Gulf of St. Lawrence or of Labrador, the opportunity is impossible. The rivers just mentioned can only be reached at the expense of much time and money, especially as there are no boats running to reach them. All this refers to the Atlantic salmon. The Pacific varieties, as mentioned in a preceding chapter, do not, as a rule, take bait readily.

The Atlantic salmon take the fly only, and special heavy tackle is required. The rods vary from 15 to

18 feet in length, and average in weight from 16 to 20 ounces. A large multiplying reel that will carry 150 yards or more of light linen line is required. As in other fishing, large flies are being discarded, and No. 2 hooks are generally the largest used, with Nos. 3 and 4 the favorite sizes. But one fly is used, and that is fastened to the end of a 6-foot single gut leader, that in turn is looped to a 3- or 6-foot double leader, which is attached to the line. With such a large rod two-handed casting must be done, the left hand above and the right below the reel, with the butt of the rod frequently resting against the body to relieve the hands of strain.

When casting either from a boat or the shore a position is taken above the pool, which is slowly whipped across a few times. Then the fisherman moves down some 5 or 6 feet and again casts, repeating this until the entire pool is covered. The proper way to cast is to drop the fly at the right-hand side near the shore, and, by successively raising and dropping the tip of the rod, to draw the fly up stream and then to float it back. This causes the fly to flutter, while the cast is gradually being worked across the pool to the extreme left. As just said, the cast is repeated several times before moving down. A peculiarity of salmon, in which it differs from trout or bass, is that it comes up straight to the fly, and will not



Playing a Salmon.

strike it from any other direction or from a distance. When it takes the hook, a strike with the rod is not made as with other fish. The reason is that the salmon strikes lightly, usually hooking in the lips, and the mouth being very tender, a jerk will tear it loose. For this reason, also, a constant, steady strain must be maintained, not allowing slack at any time. A strain not exceeding two pounds should be kept on the fish, and when it is exhausted it should be led to gaff with a steady pull never in excess of this.

Usually considerable time is required to tire a large salmon and bring it to gaff, which has a tendency to make the fisherman impatient. Patience, and a constant remembrance of the light steady pull required—never increasing it—will lead to success. Salmon always remain in a pool during the day, ascending the river only at night. For this reason they are easily found, when once they have commenced to run up toward the spawning beds. It is an unanswered question why these fish take a fly, as they are never known to take food of any kind when in fresh water. Moreover, a fly has never been found in their stomach. Many old salmon fishermen claim, and with some reason, that the moving or fluttering of the fly over them as they lie in the pool is an annoyance, and they simply strike to kill it. The fact that they are always hooked in the lips,

rarely in the interior of the mouth or throat, would seem to prove this. Trout and bass take flies as food with a vicious swallow, consequently the majority gorge the hook, and fasten it well back in the mouth.

Salmon are easily seen in the pools when passing over them in a boat, which seemingly frightens them, as they move away, but only to return to their original place in a few moments. It occurs very often that they will not rise to a fly, though every effort is made to make them take the bait. Neither a spoon, nor live or dead bait of any kind, tempts them. They seemingly are able to live on the thick layers of fat they possess until returned to the sea.

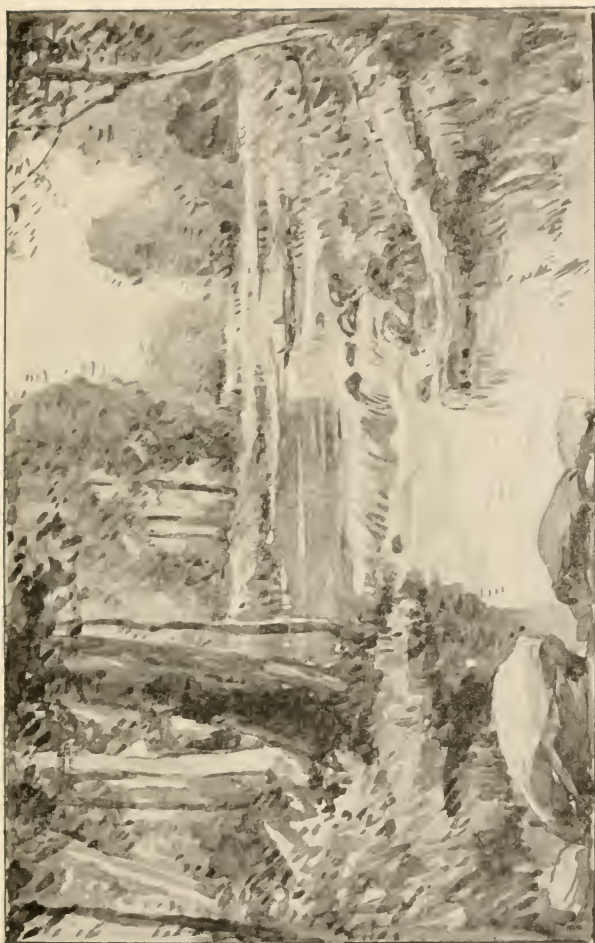
The favorite flies with salmon fishermen are the Jock Scott and Silver Doctor, although many other patterns are used. Their evident requirement is that they be bright-colored and attractive, rather than dull or of dark color.

Much experience is required to hook, play, and kill a salmon—more so than any other fish. It is best, therefore, if opportunity offers to secure such fishing, to accept the advice of an experienced salmon fisherman.

There are but two methods of properly catching brook trout of any kind—namely, with bait or fly. In lakes they are sometimes taken trolling with small spoons or spinners, but such methods are not

sportsmanlike in the case of such beautiful game fish.

There are many small streams and brooks throughout the country, containing trout, that are more or less bordered by woods or brush, or which themselves are filled with logs and snags, fly casting being impossible in either case. When the trout season opens in April or early May, as it does in the majority of States, it is entirely too early for the fly to be taken. Under such conditions the trout fisherman relies upon bait fishing, and goes forth to match his skill with the wonderful craftiness of this fish. It is a great mistake to consider stream fishing for trout with bait as not requiring skill. There is no other kind of angling that requires more. Trout, whether of the brook, rainbow, or brown variety, are crafty fish, and very easily frightened, especially in shallow waters. If undisturbed, they may occasionally be seen resting quietly in the deeper pools, but, as a usual thing, they remain hidden. Under every shelving bank, under every log from which the current has washed away the sand, and under every fall where the drop of the water has made a deep hole, there is the lurking place of the trout. Beneath or behind every obstruction that offers a hiding place, one or more fish may be found. The expert stream fisherman knows this, and very slowly he fishes, dropping his hook into every



A Trout stream.

likely place. A poor angler fishes rapidly, selecting only the most promising holes, and passes over many fish in the others. Never neglect a likely spot, no matter if it delays, and all of the brook can not be fished. Remember, the slow careful fisherman secures the most fish.

Exceeding great care must be taken in approaching or fishing a stream, as the slightest jar of the bank or motion of the body or rod will frighten the fish. A trout usually lies heading up stream, and the bait should be carefully lowered and allowed to float by or under the obstruction as naturally as possible. The moment the fish bites—which it always does with a rush—a quick twitch is given with the wrist to set the hook, and without a pause the trout pulled out upon the bank. Any hesitation allows opportunity for the fish to dart behind a snag, fasten the line, and usually work free.

When the days get hot in summer, warming the water, trout always ascend the streams nearer to their cold spring sources, and hide as far back under the banks as possible. Then it is especially difficult to catch them. If one is fortunate enough to be upon a stream when a heavy thunder shower comes up, most excellent fishing will generally follow. Such a shower precipitates large quantities of rain, which flows into the brook as surface water, roiling it up

badly. As soon as the stream begins to be discolored, the fish are unable to see the fisherman; but they instinctively know that the storm washes in food, and are watching closely for it. They take the bait eagerly then, and will be caught in holes where previously a bite could not be got.

If trout will not take any bait offered, although they are known to be in the stream, a successful scheme is to roil up the water. This is easily accomplished by getting into it and stirring up the bottom with a large stick. The stream becomes discolored for a considerable distance down, and will cause the fish to bite when otherwise they would not. This can be repeated as often as necessary. It is a perfectly legitimate and sportsmanlike ruse, and will be often found successful.

Of all bait for stream trout fishing, angle worms are the best, and those of good size are to be preferred. They should be looped three or four times through the middle on the hook, and each end left hanging to squirm about. White grubs are good occasionally, and grasshoppers in season, but worms are the best at all times. The most satisfactory angle worm to use is the night crawler, which can only be secured during the evening with the aid of a lantern. It is very large, and seems to be most attractive. Worms should always be dug up two or three days

before being used, and at once placed in fresh moss or grass. There they not only cleanse themselves thoroughly, but from free contact with the air become tough and hard. This makes a much more satisfactory bait than that freshly dug up.

A lancewood rod of eight or ten ounces makes the most satisfactory one for bait fishing, although a steel rod is excellent. Those that telescope and have the line running through the center instead of through outside rings, are especially good where the



Angling for Trout.

fishing is through heavy brush. The line can be reeled in, leaving only the hook projecting, and the rod trailed behind without danger of the line's catching on twigs. This saves time, avoids broken rods, and preserves one's temper as well. The same reels

and lines can be used as in other fishing. Either Aberdeen, Kirby, Carlisle, or Sproat hooks are adapted to stream fishing. They should be single-snelled, Nos. 4 and 5 being the correct sizes. Split shot should be used for sinkers, and not more than two or three small ones fastened to the gut. The swiftness of the current will indicate what is necessary.

Wherever waters are sufficiently open for fly fishing, and the season is right, it is a mistake not to adopt that method. A regular fly rod should be used, and either No. 5 or No. 8 flies placed on the cast, according to the size of the fish to be taken. Trout are particularly fond of flies of all kinds, and during warm weather will be seen constantly rising to them. While they may be taken in this way at any hour during the day, the early evening, and until dark, is the better time, especially on ponds and large bodies of water. In streams, a fly deftly dropped upon the water will often lure from its hiding place a fish that could not be tempted with bait. Under such conditions the hook can be replaced by a cast of flies, which is allowed to float down with the current. In fact, it is often advisable to try this whether any fish are taken from good pools or not. Absolutely the two best trout flies are the Scarlet Ibis and Parmacheene Belle.

This is the fishing that requires the bait box and

fish basket mentioned in the list of tackle required. Trout should always be killed as soon as caught by a blow on the head, and in warm weather cleaned quickly and packed in grass or leaves in the basket, so that one does not touch another. A good and merciful rule to follow with all fish caught is to kill them at once by a blow on the head, unless one is in a boat, where they can be strung on a line and kept alive in the water.

In cleaning trout use a small, sharp knife, and cut them open lengthwise from the vent to the gills; then cut the under part of the gills crosswise, and one pull will remove gills and intestines. A vein of blood will be found along the backbone, which should be removed with the point of the knife. The trout is a delicate fish, and, unless carefully cleaned, softens and spoils quickly; therefore wash the inside thoroughly.

The salmon is cleaned in an entirely different manner. A V-cut is made at the vent and a large cross cut under the head and gills. From this opening the entrails are drawn out. Then, after washing, the inside is cleaned. The flesh around the belly, which contains the layers of fat, is especially prized by old salmon fishers.

For many years past individuals and clubs have been leasing trout streams throughout the country,

leaving but few good brooks that could be fished. Many of the States have recently passed laws prohibiting such leases, and as many old preserves are now expiring by limitation, and all open fishing streams are constantly being stocked with trout, each year will henceforth afford better fishing and more waters to fish for every one.

It is the duty of every fisherman to see that the close seasons for trout, as well as all other fish, are not violated; also to aid in preventing, as far as possible, illegal fishing of all kinds.

It is well to know that in all streams and brooks in the open country trout can be found at all periods of the open season. In large bodies of water—ponds and lakes—however, they constantly change about. This is especially true of fishing waters in the woods. As soon as the ice goes out in the spring, brook trout will invariably seek rapids, where they can be taken as long as high water continues. In rapids that are especially deep they will be found all through the year. During June, July, and August these fish seek the spring holes—that is, near the mouths of cold brooks. Here they will be found, not every day, but every few days, and at such places a catch can almost always be secured.

The lake trout is, properly speaking, a difficult fish to catch. When the ice leaves the lakes in the

spring they will always be found in shallow water, from eight to ten feet deep, near the shore. As the water warms with the coming of summer they gradually work out deeper and deeper, until, in midsummer, they can be found only in the deepest part of a lake. When in shallow water, they can be taken by trolling with a spoon, with a minnow or a piece of fish attached. In deep water two methods are followed to take them. The most common way is to anchor a buoy in a likely part of a lake, baiting it by throwing in around it, for several successive days, a quantity of fish and fish cleanings cut up into quite small pieces. This will attract the fish. The boat is then anchored to the buoy, the angling being done with a strong hand line. A No. 1 or No. 2 snell hook is the proper size to use, and a heavy sinker is absolutely necessary to carry the bait down for such deep fishing. A generous piece of fresh fish is used for bait, and is lowered until it touches bottom, being then raised not more than a foot or a foot and a half. Close attention must be paid to this fishing, as a lake trout does not bite hard, and with so much line out the strike is scarcely perceptible. As they take the bait whole and at once, no delay should be made in striking them sharply. Usually good-sized fish are taken, and they fight very hard. About 40 to 60 feet depth of water is as deep as this method of fish-

ing can be successfully practiced. If properly and patiently followed such fishing will prove to be thoroughly satisfactory.

The other method is deep-water bottom trolling. A heavy line of 100 to 150 feet is used, with a pear-shaped sinker of $2\frac{1}{2}$ ounces. About 4 feet above the sinker a 6-foot leader or piece of line is attached, to the end of which a No. 1 snell hook is fastened, and baited with a minnow or piece of fish. This fishing is done from a boat which is rowed slowly, the line being run out until the sinker touches bottom. It is then raised a trifle, but every moment or two dropped again until the bottom is felt. This is done to keep the line as close to the bottom as possible. With a little practice it is easily accomplished. This fishing, of course, is done by hand, for the same reason that angling at the buoy is—to feel readily the delicate bite given. When opportunity offers, lake-trout fishing should be taken up, as it affords most delightful sport, calling into play great skill. Do not overlook always using swivels in attaching hooks to lines when trolling.

The salmon family are not only collectively and individually the most beautiful game fish we have, but of double interest from the fact that they afford a greater variety of fishing than any other single kind of fish.

CHAPTER XII

OUANANICHE AND SEA-TROUT FISHING



Canoeing for Ouananiche.

WHILE all fly fishing is to a certain extent similar, the method of taking ouananiche varies considerably in many respects from all the others. This fishing is done mostly upon rough, seething, boiling waters and requires a certain amount of practice to bring success. In the first place, it is well to know in advance that when one of these fish is hooked the fisherman is obliged to fight not only its own strength, but that of the current as well. As stated in the chapter on the ouananiche, none of the fresh-water fish can equal its fighting powers, and, pound for pound, it will out-fight even the salmon.

Ouananiche are great smashers of rods and tackle, unless one understands how to play them, especially when they make their numerous high jumps from the water. It is not an exaggeration to state that

these jumps will average at least five or six, and frequently will number ten or twelve. And such leaps! Two or three feet out of the water, often toward the fisherman, then a rush deep down—a pause—a succession of jerks that would seem to tear the hook loose—a wild rush of varying distance, and a run back, almost to the angler's feet. A fish weighing $3\frac{1}{2}$ or 4 pounds will make a fight lasting ten or fifteen minutes, often longer, and that means hard work for every moment for the fisherman.

The method of playing the ouananiche is worthy of description in detail, as it will aid intending fishermen greatly. Rods from $5\frac{1}{2}$ to 8 ounces give the most satisfaction, 6 or $6\frac{1}{2}$ ounces being the best. Much lighter and even heavier rods are advocated by some anglers, but long experience proves their error. A very light rod can not check a fish, since it does not afford a sufficiently strong spring to tire it. A rod heavier than the weight mentioned does not bend readily enough to act as a spring; it is too stiff. So far as possible, the ouananiche should be played with the rod bent to a C-shape, the butt toward the fish. While the right hand holds the rod, some six feet of line should be drawn out between the reel and first ring with the left. Holding the rod and line in this way checks the fish from making long runs, and pre-

vents excessive strain during its jumps. When a jump is made, the rod is pointed directly toward the fish, and line given or taken with the left hand, as the strain may warrant. This method of fishing will tire any fish much quicker than playing it with rod and reel alone, and doubtless will save a greater number. It causes a steady strain, and is the only method that will prevent too much pull at any single moment. In reality, the hand takes the place of the reel to a great extent. Certainly a fish can be handled in a much more delicate manner, the various jerks and pulls indicating, through the sense of touch, just what is to be done. In case a fish pulls too hard, or undertakes to make a run, then the line is released by the hand, and all necessary playing done with the reel. The line can be quickly grasped again in the event of farther jumping.

No more than two flies on a 6-foot leader should be used, and if the fish are biting freely it is safer to use but one. If two ouananiche are hooked at once, both are rarely saved, as either a fly or leader, if not the rod itself, will be broken by the vigorous pulling in different directions. Patience is a good virtue to practice with all fish, but especially with the ouananiche. Never try to hurry them in any way, but play them as long as necessary, and lead them to net only when they show exhaustion.



Playing a Ouananiche.

More fish have been lost through haste than through any other single cause, and nearly all anglers at times lose patience.

The ouananiche being generally taken in very rough water, they should, whenever possible, be led to a quiet eddy to play and land. This relieves one from the added strain of the swift-flowing water. The same flies are used as in salmon fishing, the gaudy bright ones being preferred. At times almost any fly may be used successfully; when the fish do not rise readily, different ones should be thoroughly tried. Some locally known flies, such as the B. A. Scott and McCarthy Ouananiche, are usually found to be attractive. In fishing with two flies, always use the brighter one as the trailer or end, and a dull contrasting one as the dropper or top. Nos. 4 and 5 are the proper sizes of hooks to use.

Those who have the time and opportunity, and have had sufficient practice in fly casting, will do well to seek the ouananiche, and then to turn to sea-trout fishing, for, with the exception of salmon, these two fish afford the greatest sport that the angler can find. As has been stated, all rivers flowing into the St. Lawrence below Quebec, and those running into the Saguenay, are naturally trout waters. With the going out of the ice, often earlier, the trout all run down to salt water, and remain there until July or



A string of Quanniche.

August, when they again ascend the rivers preparatory to spawning.

During June and July, until all have ascended the rivers, these fish are always found in the vicinity of the mouths, in what might in reality be called the spring holes. They seem to require cold water, as do fresh-water trout. Here they are taken with the fly, or with bait, if one prefers. This fishing is done from boats, as the fish are generally too far out from shore to be reached otherwise. Usually sea trout are very plentiful, and it is rarely indeed that a day's fishing will not give satisfaction in the number taken. Exactly the same tackle is used as for ouananiche, trout, or bass, and the same flies, both in kind and size. The area to be fished in is generally much larger than that of a spring hole in fresh-water lakes, and gives the fisherman ample opportunity to test his casting ability. Occasionally during the day, and always in the late afternoon, the trout are seen rising as in fresh water. The fly should be dropped into the swirl they make, a strike being almost invariably the result. This is one of the many occasions where accuracy is required, and the necessity of acquiring it will be seen.

While small sea trout are often taken, their average weight will be found to be greater than that of the fresh-water variety. Fish of 3 and 4 pounds



Quannaniche Pool.

are often taken, and of 6 to 8 pounds occasionally. They fight hard, as do all trout, and afford unbounded sport. As explained in a previous chapter, the exterior colorings of trout change materially upon their leaving fresh water for the sea. The bright colors and spots become dull, and the fish lacks much of its former beauty. No change occurs in the color of the flesh or its excellent qualities for the table.

When the fish begin to leave the sea and ascend the rivers, the bright colorings not only return, but actually appear to be more beautiful than those of the trout that always remain in fresh water. Here they are found in the deeper holes, and rise greedily to a fly. Their greediness is difficult to understand, as most of the rivers referred to are salmon streams, and trout are mortal enemies of young salmon, being almost always gorged with these fish when taken. They are so plentiful and constantly increasing that it is feared they will destroy the salmon. In many rivers an effort is being made to stop their ascent from the sea by placing a series of nets across the mouths of the streams. As trout do not ascend until long after the salmon have gone up, there is no interference. The result of the experiment is being watched for anxiously. The lessee of any salmon river will gladly give permission to fish it for trout for the reasons given.

But little attention, comparatively speaking, has been given to sea trout, principally because their nature was not understood, and, in fact, but little has been said or written in regard to them to arouse interest. The lessees of the sea-trout streams on Long Island are very enthusiastic over the fishing they secure, as are those sportsmen who have sought it in Canada. The Canadian rivers are now more quickly and easily reached than formerly, and as the fish are rapidly acquiring fame they are bound to become much sought after by anglers. However, sea-trout fishing is but fishing for brook trout under different conditions, and amid varied surroundings. They offer, however, two extra inducements—they are more plentiful and usually average larger.

CHAPTER XIII

ANGLING FOR BASS



A good string.

THE descriptions given of the methods of catching salmon, ouananiche, and sea trout may not prove of immediate interest or assistance to many fishermen, but it is to be hoped that they will eventually be of service to all. The subject of bass fishing, however, comes close to the heart of every angler, as they are beyond question the most widely distributed, and doubtless the most sought for, of all fresh-water fish. Almost every one has caught a bass, or desires to catch one, and there is certainly nothing to prevent him. They are very plentiful, and to be found on all sides. But they are hard fighters, and to catch them in numbers one must understand their nature, and be something of a skilled fisherman as well.

In Chapter V, sufficient has been said regarding

the nature and habits of the bass family to afford a good understanding of those points. Now the varied methods of catching them are to be explained. The most approved as well as the most skillful manner of taking black bass is with the fly, but that is not always possible, for very often they will not rise to one—can not be tempted with any kind. They may be too deep down, or the water may be roily, necessitating other methods of fishing that will place the bait near to them. As the methods are numerous, each will be explained in turn.

As fly fishing for various fish has been fully explained a number of times thus far, it is not necessary to go into the matter in detail here. The same rods, reels, lines, flies, and leaders are used as for trout. Nos. 4 and 5 flies are advocated by most fishermen, although a few prefer larger sizes. That is a matter of choice, but the decision of the majority seems best.

Black bass should always be fished for on stone or gravel bars, whether in lakes or rivers—that is, the small-mouth variety. The large mouth are found, as previously described, in the vicinity of grass, flags, and weeds, and over muddy bottoms. They do not take the fly as readily as the small mouth, being more frequently taken on bait. Fishing for this variety will be described later. When the water is

favorable, clear, and not too deep, the fly should always be used. Either on shore, or from a boat, position should be taken above the bar, if in a river, and the casts made down stream. Occasionally the flies should be allowed to drift down across the bar and to sway with the current, while lifting and dropping the tip of the rod from time to time is advised.

Next to the ouananiche, the black bass is the hardest fighting fresh-water fish we have, not only in mad rushes, but in jumping as well. When they rise to the fly, a short, sharp strike is made with the rod to set the hook securely, if possible. It is necessary to know that the interior of a bass's mouth is almost entirely bone, therefore it should be struck harder than any other fish. When once it is hooked, patience must be practiced, as hurried effort to bring it to net usually results in its loss. Always wait until it is exhausted. With a good rod and the full strain put on the fish by giving the butt, it does not require a long time. Bass afford magnificent sport—enough to satisfy the desires of any fisherman.

When flies are not successful, there are several other methods of taking bass that afford nearly equal satisfaction, provided a light rod is used, preferably a fly rod, except under certain conditions. One should always be prepared with bait for such emergencies, a variety being necessary to insure success.



Playing a Black Bass.



Live bait is required, including minnows, soft-shell crabs, dobsons, angle worms, and crickets; the first two being usually the best, though there are times when some one of the others only will be taken. Unless one desires to cast a small spinner, either with or without a minnow attached, or a minnow fastened to a plain hook, he will always get more sport by using a 6- or 7-ounce fly rod for bait fishing as stated. For spinner or minnow casting an 8- or 10-ounce rod is required, the latter being the best. In bait fishing,



Spinner with Minnow.

Nos. 2, 3, or 4 sproat or Kirby snelled hooks are the proper ones to use, and, if the line is to drift down across the bar, only sufficient weight of sinker should be attached to keep the bait under water, but not deep down. A fly rod used for this fishing makes the sport as keen as though a fly were used. It is catching a hard-fighting heavy fish on a light rod, but should not be attempted until one is thoroughly proficient in handling such a rod.

In fishing with bait, either by having it drift with the current in a river, or in deep water in a lake, ample time should be allowed the fish when it first bites before striking it. This is especially true in

using minnows. If the line is jerked when the bass first takes the bait, it will be pulled from its mouth before it has an opportunity to swallow the bait and to get the hook fast. By keeping the line taut the fish can be felt working at the bait. When gorged it will start away. Then is the opportunity to strike and set the hook.

Minnow casting requires quite a little practice, as the minnow is easily thrown off. A fairly heavy rod is used, as stated, and the bait carefully cast back, until touching the water, two or three yards of line being pulled out from the reel and held in the left hand. Then the cast forward is slowly made, the slack held in the left hand being allowed to run out as the line straightens, the minnow dropping gently into the water. It is allowed to sink a little and is slowly drawn back, another cast being made. Casting with a small spinner is done in exactly the same way. This kind of fishing will often prove successful when all other methods fail.

All lakes inhabited by bass contain either rocky bars, or points and shelving shores of stones, upon or about which the fish will usually be found. If they run in shallow water, about ten feet deep or less, flies can be used, but in deeper water bait fishing is better. Sinkers sufficiently heavy to carry down the bait should be used. When two or more are fishing

together, different baits should be tried until it is found which is being taken the best. In using minnows, hook them through the lips or through the back just under the dorsal fin—the former is preferable—especially with large bait. Two small crabs, about an inch long, seem to attract fish better than one large one. They should be hooked through the tails, and back to back. Dobsons and angleworms should be placed on the hook in such a way that they can squirm about. Two or three crickets, and often grasshoppers, make splendid bait.

Very frequently bass will be found on stony bottoms at depths varying from 30 to 50 feet. To secure them so deep down, a very stiff bait rod is required, as fully 50 or 60 feet of line are necessary to reach that depth with a heavy sinker, and the fish can not be struck sufficiently hard to set a hook with a light rod. A minnow should be used for bait, and ample time allowed the fish to gorge it after the first bite. A long line being out, the advantage is on the side of the fish, great care being necessary to save it; not a particle of slack should be allowed.

When all other methods fail, the last resort is to troll a small spinner, with or without a minnow, or a minnow on a snell hook, very slowly across the bars or around stony points. No sinkers are used, and 40 or 50 feet of line should be run out. In fishing

in this manner, the strike is usually made a moment or two after the fish bites, as a moving bait is generally taken entire, the hook being in the mouth.

All the preceding varieties of fishing refer particularly to the small-mouth bass. As the habits of the large mouth are different, other methods are followed to capture them. One of the best ways, and a favorite one, is to cast a minnow, crab, or frog along the flag- or weed-grown shore of a river. The boat should be slowly rowed, and a long rod used. This allows the bait to be carefully thrown in the shallow water without frightening the fish. A line not much longer than the length of the rod is used, permitting accurate casts to be made. This is usually a very successful way to catch these fish. Another method used in early summer, before the weeds have grown under water, is to drift as closely to shore as possible, fishing with a minnow. A No. 1 or No. 2 hook should be used, and the bait fastened through the lips. A heavy sinker is required, and a cork float is fastened to the line, about 6 feet above the hook. This should be floated about 15 feet back of the boat. If preferred, the float need not be used, in which event the sinker is omitted and about 30 feet of line are run out. In either method the fish must not be struck until some time after it bites, giving it ample time to gorge the bait. A swivel must always be used between

the snell and the line, as the minnow is constantly turning and twists the line badly. Of course, where practicable, one can still fish from the shore or a boat with any of the baits mentioned for small-mouth bass, good catches being often made. Large-mouth bass are not looked upon with as much favor as the small-mouth variety. As already stated, they fight just as hard for a short time, but do not keep it up, as does their relative. Neither are they considered equal as a table fish. They seem to taste, and almost to smell, of the bottom from which they are taken.

Strawberry bass afford unlimited sport during the season when they are biting well. They are generally found in large schools, but as they are constantly moving around, they must be followed about in a boat. In fishing near bridge abutments and old piers for black bass, the strawberry bass is often taken. It has a very small mouth, as the illustration shows, consequently small hooks and very small minnows must be used for bait. A No. 5 sproat hook is the best size and kind.

No one desires to catch rock bass, but, unfortunately, as we have seen, they bite, and often get caught. It is therefore not necessary to advise how to catch them.

White bass, or, as they are otherwise known, striped or silver bass, are only caught by chance, and there-

fore can not be especially fished for. They are really inhabitants of the Great Lakes, but a few run into the rivers tributary to them, and are occasionally caught when angling for other fish. They are taken on minnows and crabs. As they are determined fighters, anglers always hope that good fortune will send one to their hook. They are always taken with bait, rarely, if ever, with flies.

CHAPTER XIV

HOW MUSKALLUNGE, PIKE, PICKEREL, AND PIKE PERCH ARE CAUGHT



A trolling spoon.

As has been stated, muskallunge are not naturally very widely distributed throughout the country, and

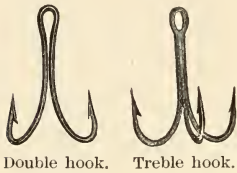
although they are being artificially propagated by the New York State Fish Commission, but few, if any, are being planted in new localities. They are probably the most voracious fish found in fresh waters, living entirely upon fish of all kinds. If placed in waters not hitherto inhabited by them, they will destroy a large number of other fish, if not exterminate them entirely. Their range includes Lakes Superior, Michigan, Huron, Erie, and Ontario, the St. Lawrence River, the upper Ohio and Mississippi River valleys, and rivers and lakes in Wisconsin, Minnesota, New York, and possibly one or two other States. In Canada a few are taken in the province

of Quebec, but in Ontario they are present in great numbers in nearly all large waters.

Muskallunge are caught either by trolling or still fishing, according to the locality and their numbers. The method generally practiced is trolling, a spoon or minnow being most effective, though a piece of fish or meat cut in a long strip will often prove successful. In trolling, a hand line can be used, but the better plan is to use a strong, stiff trolling rod, in order to get the benefit of a reel. From the moment muskallunge are hooked until they are gaffed, the fisherman has his hands full. They are constantly rushing in all directions, and frequently leap from the water. Add to their natural fighting powers great size and weight, and it will be readily understood how difficult it is to check their runs, or master them until they are exhausted by constant efforts to break loose. This requires some time, as the fish can not be hurried to any extent. It is in its game fighting powers that the muskallunge differs from the pike and pickerel. In fact it exceeds them, in this respect, practically beyond comparison.

A trolling outfit consists of a No. 1 braided linen line fully 100 to 150 feet in length, Nos. 6 and 7 oval and kidney spoons (nickel finish), heavy swivels, and an assortment of ringed sinkers. As a matter of safety, a twisted leader 3 feet long should be fastened

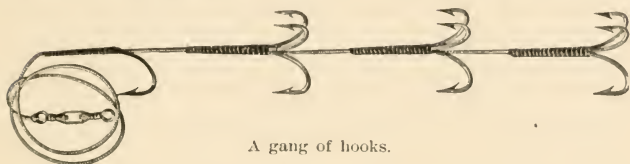
to the line with a swivel, and to that the spoon should be looped with another. In shallow water, trolling near the surface, a very light sinker is used, or none at all. As deeper fishing becomes necessary, heavier sinkers are exchanged for the smaller ones. We know now that in trolling with spoons for any variety



of fish, treble hooks are a disadvantage, double ones being much better. This is more particularly true with small fish, or those with small mouths. It is believed, however, that even large fish often strike one of the three hooks and knock them all aside; with two this is not liable to happen. Double hooks will hold strongly enough, and very rarely fasten the jaws together as treble ones do, thus giving the fish more opportunity to fight. A simple plan is to file off one of the three hooks originally on the spoon.

In trolling with a minnow, a gang of hooks especially tied for the purpose on gimp (silk wound with wire), or on steel wire, should be employed. One composed of No. 2 double hooks will be best. Three of these are fastened one above the other, about two inches apart. Above them a No. 4 or No. 5 single hook is placed, to which the minnow is attached, hooking it through the lips. This is tied to the line

or leader, with swivels and sinkers added, as in using spoons. A twisted leader not only causes a spoon or



A gang of hooks.

gang to draw better through the water, but is much less liable to be cut through by the sharp teeth of the fish.

Pike and pickerel are caught by the same methods as described in taking muskallunge, with the addition of some others to be mentioned. Pickerel are more particularly a river fish, while pike usually make their home in the lakes. This is a general rule only, as both are often caught in circumstances just the reverse. In all rivers where flags and weeds line the shores heavily, pickerel, and often pike, will be found among them during most of the year, but especially in the months of May, June, and July. In lakes they can be taken by trolling, until the weeds grow too high and prevent it. Pike and pickerel are rarely found in open waters with clean bottoms. Like the muskallunge, they hide in the weeds, ready to dart forth at their prey. All angling for these fish must therefore be done in the vicinity of these subaqueous growths. No. 4 or No. 5 spoons will

prove to be of good size, unless very large fish are liable to be taken.

In the spring and early summer large pike are caught by drifting with minnows, in the same manner as described for large-mouth bass in the preceding chapter. This can be done both with and without a cork float. The former method does not require as much skill, since the float indicates not only the bite of the fish, but its every subsequent movement. Without the float this must be learned by the sense of feeling. In the former case, when pike or pickerel take the bait, the float is immediately pulled under water, reappears again in a few moments, and then is kept bobbing up and down, until finally it disappears, being gradually moved away. Then is the proper time to strike the fish. This delay is owing to the fact that the minnow, being always hooked through the lips, is first taken lightly by the fish and slowly turned about to be swallowed head first. The bobbing of the float indicates the turning of the bait, the final moving away and its disappearance showing that the minnow has been finally gorged and the hook taken well down into the mouth of the fish. It will be found more satisfactory to use a stiff trolling rod for this fishing, as the line can be kept well away from the boat, the strike made more effectually, and the fish more easily

brought to net. A No. 2/0 or No. 1/0 wire or gimp snelled hook is the safest and best to use.

It is a fact that trolling of any kind can be better performed with a rod, no matter what variety of fish is being caught. It gives a spring that a line held in the hand does not, and a reel is of the greatest benefit in addition.

In good waters, still fishing for pike and pickerel is often practiced, minnows being used, and allowed to swim about by using a light sinker. This fishing requires a great amount of patience; therefore it is much preferable to troll, to seek the fish if they will not seek you.

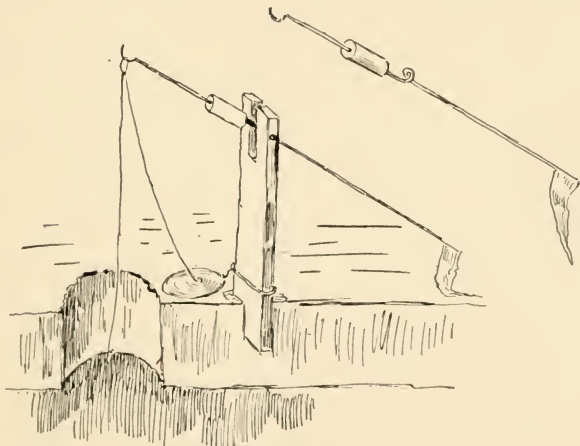
The majority of spoons, as made, have a tuft of feathers fastened about the hooks, and the best advice to give is to remove them at once. A small spoon or spinner with these feathers or a fly attached is particularly good for bass, but not for pike or pickerel. If any addition to the spoon is needed, which is very rarely, use a minnow, alive or dead, or possibly a trailing piece of pork or fish. Several worms looped on the hooks make the spoon much more attractive for pike perch, and occasionally for pike and pickerel as well.

When winter comes, and most of the fishing waters are frozen over, the majority of fishermen put away their tackle, regretting that their sport is

ended for several months. This is an error, as they overlook the health-giving sport of fishing through the ice. In almost all States having a close season on pike, pickerel, and pike perch, fishing for them through the ice is allowed generally until March 1st—that is, in waters not containing trout of any kind. In waters containing them, such fishing is usually absolutely forbidden by law. This fishing is done in two ways, one of which is to have a small shanty on runners that is drawn over the ice to a good fishing point, and banked up tightly with snow to exclude the light. The windows are covered with board shutters for the same purpose, so that when a trap in the floor is opened and a hole cut through the ice, the fisherman, being in the dark, can see to a great depth, ample light coming through the ice on all sides. A small stove makes the interior comfortable. With a hand line, good bait, and a sufficiency of patience, success comes in the end; if not, the shanty can be quickly moved to another location. This is certainly a most comfortable and lazy method of fishing.

The better plan—one that affords sport, exercise, and an opportunity to feel the benefits of the bracing winter air—is to fish with tip-ups. The varieties of these used in different localities are innumerable, but all are built on the same principles, for use either

above or below water. A description and illustration of the simpler method of constructing each, and using both, will be sufficient to make the subject clear. The above-water tip-up is composed primarily of a board 18 inches long, $2\frac{1}{2}$ inches wide, and $\frac{3}{4}$ inch thick, with a slot $\frac{1}{2}$ inch wide, cut 5 inches down the center at one end. A piece of wire about $\frac{3}{16}$ inch thick and 20 inches long is bent around a piece of iron to make a small loop 8 inches from one end. This loop is placed in the slot and a nail driven



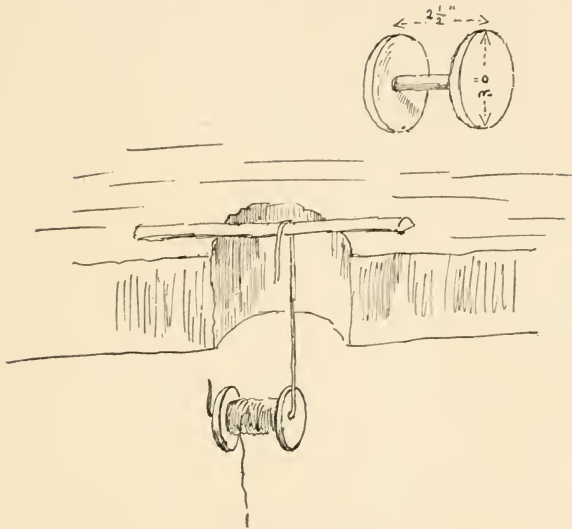
Above-water tip-up.

through the edge of the board, making a pivot for the wire to work upon. A 2-ounce lead sinker is arranged to slide freely on the short arm, and a hook

formed on the extreme end, which is elevated to a considerable angle above the ice. At the end of the long arm a piece of cloth is fastened. A line 20 or 25 feet long is tied around the upright board, and all but 8 or 10 feet of it coiled upon the ice. At this point a loop is tied in the line and hung over the hook on the short end of the wire. A No. 2 or No. 3 snell hook is used and baited with a minnow without a sinker. A shallow hole having been chopped in the ice, the upright is placed in it and water poured about it, which soon freezes and holds it in place. A hole 8 or 10 inches in diameter is cut to drop the line through. A fish biting pulls the arm down and releases the loop from the wire hook. The additional line coiled upon the ice allows ample slack for the bait to be turned and gorged, so that when all is out the fish is brought up sharply and hooked. At the same moment the wire is pulled down releasing the line, the lead weight slides down to the hook at the end, holding it down, and the long end with the cloth attached is elevated in the air to signal a bite. The use of these tip-ups necessitates constant attention to keep the water from freezing in the holes and holding the lines fast, and for this reason they can not be left overnight and worked successfully.

The under-water arrangement is less elaborate, and is always in working order, night and day, no

matter how hard it freezes. It is very simply constructed. A number of spools should be turned of the following dimensions: diameter of ends, 3 inches; inside width, $2\frac{1}{2}$ inches; diameter of spindle, 1 inch; thickness of ends, $\frac{1}{2}$ inch. These should be turned from hard wood, thoroughly oiled, and in



Under-water tip-up.

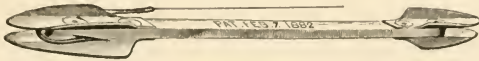
the edge on one side three or four holes bored close together and filled with lead. The lead prevents the spool from revolving freely, unless pulled hard by a fish. A hole is bored lengthwise entirely through the spindle, and a $\frac{3}{16}$ -inch wire put through and bent

up $1\frac{1}{2}$ inch. The other end is bent up 15 to 20 inches, according to the thickness of the ice, and bent over to form a hook 5 or 6 inches long. In use, 20 or 25 feet of line are wound around the spool, and 6 or 8 feet left hanging, to which are attached the same hook and bait as with the other tip-up. A stick is placed across the hole, and the loop of wire hung over it, allowing the spool to hang below the ice in the water. A fish biting unrolls the line from the spool until the end is reached, when it is hooked. If the hole freezes over, the ice can be broken at any time, and if the line is unrolled, a fish has taken the bait, otherwise not.

In fishing through the ice, pike perch are taken as readily as are pike and pickerel, but they seem to take the bait best at night. In summer the favorite method of taking them is to troll with a No. 4 or No. 5 spoon without feathers, and two or three good worms looped on the hook. Trolling for these fish is usually done with 25 or 30 feet of line, about 15 feet of No. 18 copper wire being fastened to it, the spoon being attached with a swivel. The wire is less noticeable than the line, causes the spoon to sink deep without a sinker, and reduces the liability of catching in the weeds. The depth desired is easily maintained by letting out or drawing in the line.

Trolling with a gang, or single hook, with min-

nows is also a favorite method of fishing for pike perch. As they are usually found in water ranging from 12 to 40 or 50 feet, deep trolling must occasionally be done. On a hard, clean bottom, still fishing with minnows or angleworms is often successful. In the early summer these fish are taken on river rifts in 5 or 6 feet of water by allowing the bait to drift down with the current from above, a sinker being used, with minnows for bait. Pike perch rarely rise to a fly. They are a particularly gamy, hard-fighting fish, and afford excellent sport. In taking them from the hook great care should be exercised, as their teeth are very sharp and liable to lacerate the fingers badly. The dorsal fin is composed of very sharp bristling spines that must be avoided as well.



Hook disgorger.

Muskallunge, pike, and pickerel also have particularly sharp teeth, and usually are hooked well back in the mouth; a hook disgorger is therefore a good thing to carry in the tackle box.

CHAPTER XV

ANGLING FOR OTHER FRESH-WATER FISH



Three Perch at a cast.

THE various fish described in Chapter VII, under the title Miscellaneous, receive, with one or two exceptions, but little attention from anglers. With the many game fish to be taken, whose ranges, natural and from planting by Fish Commissions, are now covering the greater part of the country, these other fish are, in fact, to a certain extent, looked upon with contempt. This is a mistake, and a great one, as they afford, under favorable conditions, most excellent sport. Perches, carp, bullheads, and catfish can always be found and angled for, but sheepshead and ling are taken only by chance, except when the last named is fished for through the ice.

Yellow-perch fishing is particularly amusing, and usually very successful. Owing to the great stretch of country over which they are now found, almost every

one can have an opportunity of taking them. They are one of the best-known fish in the United States, and very few there are who have not caught them, especially when out for other fish. In fly casting for bass, or fishing with bait, or trolling for bass, pike, pickerel, and pike perch, these fish are very often caught. They are especially partial to minnows, and frequently keep one busy catching them when bass especially are being sought. At such times they are a nuisance, as is the rock bass, and perhaps upon this account they are held in disrepute by many anglers.

Perch grounds are easily found, always being on stony bottoms in the vicinity of the weeds along the shores and in the shallows of lakes. Small minnows make the best bait, with angle worms next, although they are frequently taken with small crabs and pieces of fish. From about August until the ice comes they rise readily to the fly, taking it best in September, October, and November. The flies can be either cast or trolled, the latter being the more satisfactory and less tiresome way. As these fish usually run in schools, large numbers will be seen following the cast, and with three flies on the leader, three fish are often taken simultaneously. If variety is desired, a small spinner can be substituted with equal success. Occasionally in trolling the fly in this way, small pickerel

will be caught, which is in reality strange, as they are not at all a fish that rises to the fly.

Fishing through the ice for perch is particularly good sport, as they bite fast and keep one busy. Tip-ups are generally used, but if it is not too cold, a hand line will take large numbers. For this fishing small minnows make the best bait. Provision for winter ice fishing must be made in the fall by securing a sufficient quantity of minnows before the brooks freeze up. They can be kept in a deep box or car through which the water flows freely, and so placed that when the ice comes the top will be above, and a good part of the box below it. They will not need feeding, although there is no harm in doing so occasionally.

White perch are found only in rivers flowing into the sea on the Atlantic coast, and therefore must be classed as semi-fresh-water fish. While it is not known how long they remain in fresh water away from the sea, they are usually taken from April to September, although the season varies in different rivers. They are generally found in schools, and early in the season on or about muddy bottoms, but later are taken near rocky shores. Angle worms and pieces of fish are the favorite baits, and large strings are often caught in a few hours. That well-known salt-water fish, the striped bass, might be classed with

this perch as a semi-fresh-water fish as well. They are found all along the Atlantic coast line, and have been successfully planted on the California coast. They ascend the rivers for a little distance to spawn, and are taken with bait and strong tackle in brackish water, or just above.

Carp will never prove a favorite fish with anglers unless they are caught with the idea of exterminating them. As has been explained, they destroy the eggs of the game fish, and the majority look upon them as not a bit better than a sucker for food. The occasional angler, or those fishing for food, desiring to secure any fish possible, are about the only ones who care to catch them. It is possible that in good waters, isolated, and with proper food, the carp could be made a good table fish; as found to-day, they certainly are not. They are taken only by hook and line, pieces of dead fish or meat, or even a thick cutting of potato being the best bait. Nothing alive, including worms, will attract them.

Bullheads are found in all rivers, ponds, and lakes, and in nearly all of the States. They are occasionally taken when bait or still fishing for other fish, but the proper and successful methods consist of two only. One is still fishing, in localities where they are known to be, in which the fisherman can use several lines, using pieces of fish or meat for bait.

While bullheads are caught during the day, the best success is secured during the late afternoon and evening, even after dark. The other method consists of using a set line with a large number of hooks baited, as for still fishing. The line is put out at night, deep enough to place the hooks on the bottom. In Eastern waters good-sized catfish, often ranging from 10 to 20 pounds, are taken in this way. In the Mississippi River and its tributaries, and in the bayous of the South, large catfish, ranging in weight from 10 up to 150 pounds, are taken in great numbers by both angling and set lines. Bullheads are esteemed by many a particularly good table fish.

The sheepshead or drum, while taken frequently in nets, can not be angled for successfully in Northern waters, as they have no especial bottom where they can be found. They are quite frequently caught when still fishing for bass or pike perch, taking either a minnow or crab. Caught in this manner, they usually range from 3 or 4 to 20 pounds in weight, but sheepshead weighing as much as 60 pounds are taken in netting. Those secured in the warmer waters of the South are not considered as good a food fish as those taken in colder waters. The Southern fish are quite plentiful, and are caught by still fishing with almost any variety of bait.

As has been previously stated, the burbot, known

more frequently as "ling," "lawyer," or "cusk," is a cold-water or Northern fish. Like carp and bullheads, it is especially a bottom fish. It can not be successfully fished for with bait exclusively, except in some specially confined waters, where it is known to be plentiful. Similar to the sheepshead, it is occasionally taken with minnows, when fishing deep down for other fish. More frequently it is caught when fishing for bullheads at night, and upon set lines placed after dark. In many lakes, where burbot are plentiful, great sport may be had in catching them through the ice. Minnows should be used for bait. In 20 or 30 feet of water, over soft bottoms, they will be readily taken, if the bait is close to the mud. They are savage, hard fighters when hooked, and considerable effort is required to bring them up to and through the hole in the ice. They should be killed at once with a blow on the head, as the hook can be more easily removed, and they are prevented from squirming about, which they can do for a long time.

CHAPTER XVI

CAMPING—HOW, WHEN, AND WHERE



A camp breakfast.

CAMPING out during the summer or early fall months is now looked upon as being the most enjoyable manner of living for the fisherman. As it is a subject so closely related to that of fish, especial attention and space should be given to a thorough description of all pertaining to it. One can seek a vicinity where good fishing is known to exist, pitch a camp, fish much and rest little, at the same time gaining the healthful benefit that "roughing it" and living in the open air insure. Two things should be known in advance—namely, where to go and how to camp out. Of course the best season to catch fish, and the time one can get away to enjoy it, are also to be taken into consideration.

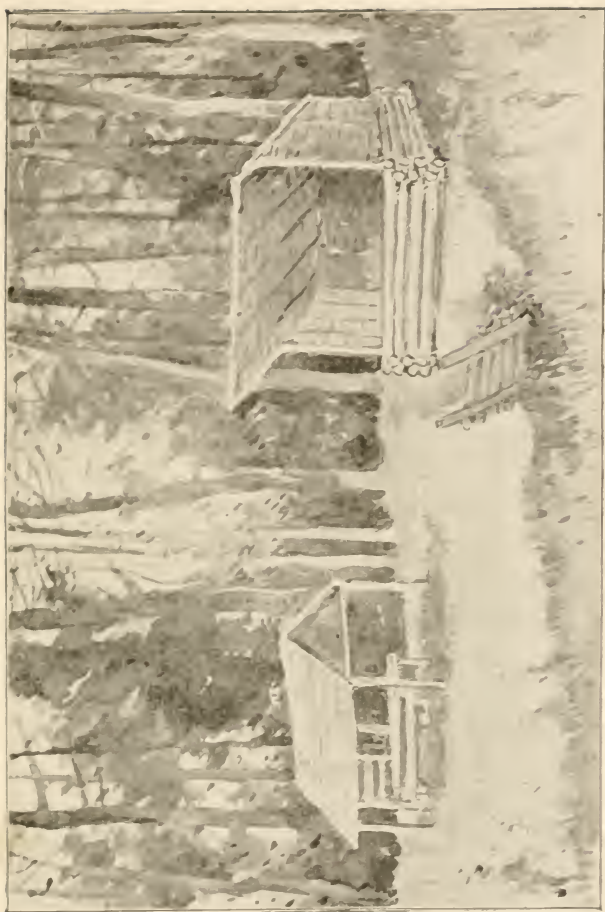
Camping is seemingly a simple thing, but without

previous experience, or advice from those who have it, success can not be attained. The selection of the place to go to is most important, and it will be impossible, of course, to give advice on that point except in a general way. The wooded shores of a lake or banks of a river should be chosen, as large timber affords protection from the sun, as well as from rain and wind storms. Care should always be taken, however, in selecting a site, to avoid the vicinity of dead standing trees, as they frequently fall during high winds. Another point to bear in mind is the vicinity of a spring, if possible, good water being a necessity, and spring water is more healthful than that from lakes or rivers. It is an easy matter to learn where to go, especially in the neighborhood of one's home, as the nearby fishing waters are well known. To secure the best sport and thoroughly enjoy camp life, however, one should get away from civilization—go into the wilderness.

Considerable time is required for such a trip, and much expense attends it, a more elaborate outfit and guides being required. The mountains of Virginia, the wooded wildernesses found in Pennsylvania, Maine, New York, and many of the middle Western States, as well as the immense unsettled Rocky Mountain territory, afford unlimited country to select from. Unfortunately, the advance of the lumberman

is depleting the forests, and settlements rapidly follow in his steps. This necessitates the making of long and difficult journeys to reach the wilderness. The most satisfactory territory to seek at a minimum of expense, a country affording unlimited and most gratifying sport, is that found in the Dominion of Canada. At a distance of from 30 to 200 miles north of the St. Lawrence River the wilderness commences and extends to Hudson and St. James bays and beyond. Several railroads have been recently built, extending north from various points, making access to any portion comparatively easy. From Quebec, the Quebec and Lake St. John Railroad extends 200 miles. From Three Rivers the Canadian Pacific operates a road some 30 miles up the St. Maurice River, connecting with a small steamer, which ascends about the same distance farther. Another branch of this road runs to St. Gabriel, opening up a fine section. From Ottawa, a road is now being extended, following up the Gatineau Valley, which opens up an almost unknown country. On the Grand Trunk and Canadian Pacific one can stop at almost any station west of Ottawa, and drive back only a few miles to find practically primeval forests. Georgian Bay and the Nipigon are now the favorite resorts for fishermen in that region.

Next to the question of where to camp, that of

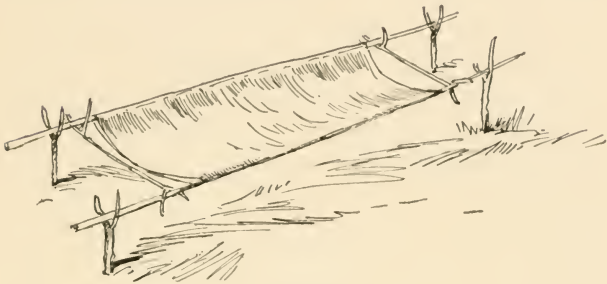


A bark camp.

how to do it successfully and comfortably is of the greatest importance. What kind of a camp to erect is first to be considered. During the warm summer months, the natural inclination is to erect an open camp of poles and bark. So far as the heat is concerned, this is certainly a most comfortable arrangement, but nothing can be more uncomfortable when such a camp is pitched in a section where mosquitoes, black flies, and punkies make their presence known. Possibly these pests may be warded off in an open camp by the use of mosquito netting, but it is doubtful. Experience recommends the use of a tent. True, it adds somewhat to the amount of baggage to be carried, but absolute comfort must first be considered. In the fall, when the winged pests have gone, an open camp can be used, but a tent will then be found warmer, as the autumn nights are very cold in the woods. Another advantage of using a tent is the facility with which it can be taken down and erected, as it may be necessary to move the camp.

How to build an open-front camp will be easily learned from the illustration. The better plan is to erect two or three courses of logs, laying light spruce poles closely together across the course next to the top, so that the poles will be held in place by the last course. This makes a spring bed, and, when covered with boughs, a very comfortable one. Poles for up-

rights and cross-pieces complete the frame, and bark forms the roof and sides. A similar camp can be built without the log foundation, and a good depth of boughs placed on the ground to sleep upon. A most comfortable camp bed is made from two breadths of heavy canvas, two and a half yards long,



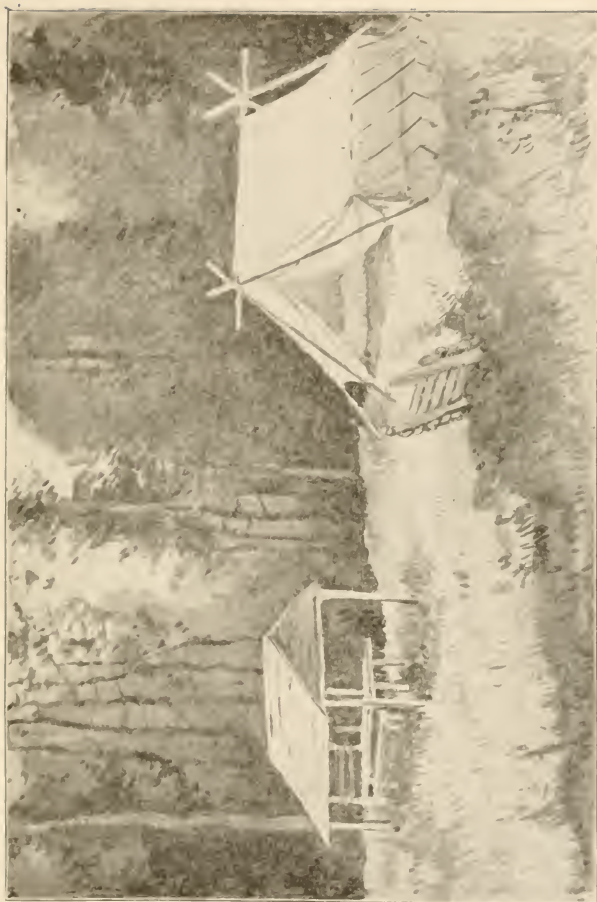
A camp bed.

with the edges sewn strongly together, the ends being left open. This bag is filled with spruce or balsam boughs, two spruce poles, about two and a half inches thick, being run through the bag. They should project far enough at each end to rest in heavy forked sticks driven well into the ground. A strong piece of wood should be fastened tightly between the ends of the poles to prevent their drawing together.

Only a thoroughly waterproof tent of the wall pattern should be used in camping, the size being

decided by the number who are to occupy it. A wall tent is much more comfortable and roomy than the A pattern. These tents are usually erected on two uprights supporting the cross pole, but as these uprights stand just in the middle of the entrance they are always a nuisance. The proper and better plan is to cut four poles, about eight or ten feet long, and to tie each pair together within a foot of the top, making shear legs. In the short crotches thus made, the ends of the cross pole are placed, after it has been put through the top of the tent. The stretcher stakes are then driven in and the stretcher ropes of the tent fastened to them, whereupon the top is elevated and the tent stretched taut by drawing the lower ends of the supporting poles together. Erected in this way, it is not liable to be blown over. When heat is required, the front flaps are thrown back, and the camp fire warms the interior. By closing the front tightly a good night's sleep is assured, as neither mosquitoes nor flies can enter. During cold nights a tent will naturally be found much warmer than an open camp.

Another question of importance in regard to camping is how to build a fire—that is, how to build one and secure the full benefit of it by throwing the heat into the camp or tent. Two 5-foot stakes, about 6 inches thick, are driven firmly into the



A tent camp.

ground 4 feet apart, at a slight angle away from and at a proper distance in front of the camp. Four or five logs, about 12 inches in diameter and 5 feet long, are squared a little on two sides, and placed one upon the other against the stakes. The bottom log should be slightly imbedded in the earth to prevent the flames from burning under; the squared edges placed together prevent a draught through the crevices. In front of this slanting wall of logs a good fire is built, the wall reflecting the greater amount of heat into the camp. Naturally, these logs slowly burn through, and during the night, as the fire dies away, they will fall into the embers and furnish fresh fuel. An ordinary fire heats a camp but little, most of the heat being wasted.

An open shanty, or tent, consisting of a roof upon poles, but without sides, will be found very convenient for cooking and eating, giving protection from the weather. One end can be closed, and shelves placed against it to hold provisions. A table and bench are easily made with forked sticks driven into the ground and covered with flattened poles and bark. Pegs can be driven under the roof to lay fish rods on to dry out when not in use.

There is nothing that causes more trouble to intending campers than the preparation of a list of necessaries, and almost invariably something is for-

gotten. The greatest mistake to guard against, however, is taking too much. It only adds to the amount of baggage, delays progress, and in the end proves to be of no material benefit. A carefully prepared list of necessaries based upon experience may prove of value, and is given below :

Pork.	Coffee pot (enameled).
Bacon.	Four tin pails, small to large.
Flour.	Plates (enameled).
Bread.	Bowls, not cups (enameled).
Crackers.	Spoons for table and cooking.
Butter.	Knives and forks.
Coffee (ground).	Large butcher knife.
Tea.	Salt and pepper shakers (tin).
Baking powder.	Cans for sugar, salt, coffee, and tea.
Condensed milk.	Mixing pan for pancakes.
Sugar (lump).	Broiler (wire).
Salt.	Axe.
Pepper.	Nails.
Maple sugar for pancakes.	Rope.
Prepared pancake flour.	Jamaica ginger.
Beans.	Quinine.
Oatmeal.	Toilet paper.
Rice.	Towels.
Canned corned beef.	Blankets.
Prunes for stewing.	Books.
Matches.	(If desired, and convenient to carry, potatoes and canned goods can be added.)
Soap.	
Candles (adamantine).	
Cornmeal for frying fish.	
Three frying pans (Aeme).	

It is difficult to give quantities, as fishermen alone do not require as much as when guides are to be

fed. It is well to provide a pound of either pork or bacon per day for each man. For a two weeks' trip for a party of four the following quantities will suffice: twenty-five pounds of flour, a few loaves of bread only, as it dries quickly, 5 pounds of crackers, 12 pounds of butter, 4 pounds of coffee, 2 pounds of tea, 1 large can of baking powder, 6 cans of condensed milk, 5 pounds of sugar, 1 small sack of salt, $\frac{1}{4}$ pound of pepper, 2 pounds of maple sugar, 6 packages of pancake flour, 4 quarts of beans, 3 pounds of oatmeal, 2 pounds of rice, 6 cans of corned beef or tongue, 2 pounds of prunes, and candles (3 pounds of twelves). The quantities of the other articles mentioned can be decided without difficulty. The figures given above are absolutely reliable. The whole list covers real necessities, and can be added to if desired.

The fish taken add materially to the various meals. And, by the way, when tired of fried and broiled fish, try boiling them in a pail with a generous piece of pork—nothing can be better.

A few nails and a piece of rope are often found very convenient in camp. Do not forget ginger and quinine, as they alleviate the minor ills often attendant upon camping out. Always be sure that all pails for cooking are made with seamed joints—not soldered—as otherwise they come apart in the fire.

Butter can be kept perfectly fresh in a cold spring away from the air.

Camping kits are made by several manufacturers, containing in a small compass everything necessary. They comprise all utensils needed for cooking and the table, and boxes for sugar, salt, etc. All are compactly packed in a large pail. Such a kit weighs much less than the various articles when gathered together otherwise, and is much more convenient, occupying a smaller space.

One of the greatest conveniences in camping, and, in fact, for fishing trips of all kinds, is a rubber poncho. It is easily made from three yards of light weight imitation rubber-coated cloth, such as is used for buggy tops. It comes fifty inches wide. A slit, just large enough to allow the head to pass through, is cut lengthwise in the center of the cloth, according to width, but a little ahead of the lengthwise center. It is in reality a blanket with a slit in it to put the head through. In case of rain, if out in a boat, it protects one perfectly, and fishing can be continued without getting wet. Walking through the woods it offers perfect immunity from rain or wet brush. At night it makes a good blanket to sleep on, as it protects one from dampness, while in extremely cold weather it makes a cold-proof covering. Being entirely open at the sides, it is cool and does not

cause the wearer to perspire as does a rubber coat. Moreover, in case of rain it covers one entirely, while a rubber coat only protects to the knees. It packs up in a small compass and weighs but three or four pounds.

Another necessary article, and a great convenience as well, is a No. 2 square rubber air pillow. When filled it relieves the hardness of the seat of a boat when occupied for some time, is a life preserver in case of accident, and makes an excellent pillow at night.

In locating a camp or tent, care should be taken to erect it on a slight knoll, if possible, and, in addition, a small trench should be dug around it. Without these precautions, in case of a heavy continued rain, water and dampness will most certainly cause trouble.

In cooking for camp, a separate fire from that used for heating is to be employed. It should be small, and started a full hour before meal time, to insure a quantity of embers, as they cook much better than a smoky flame. A forked stick is driven into the ground on each side of the fire, across which a pole is laid to hold the cooking pails. A simpler method is to drive light poles, some six feet long, into the earth, at such an angle, that, when a pail is hung on the end it will be at just the right height over the fire.

Fresh bread and biscuits, if one can make them, are a luxury in camp, and it is not at all necessary to carry an oven to do the baking. The dough is placed in a large metal plate, and another one laid



How to cook over a camp fire.

reversed over it. A hole is then raked in the edge of the embers of the fire, and the plates placed there. Occasional watching is necessary to prevent burning, the ultimate result being perfect baking. Fish can be baked in the same manner.

One of the greatest errors that can be made by those intending to camp out, especially when everything taken must be carried any considerable distance, is to include in the baggage more clothing than is necessary. It is well, therefore, to give a list of what is actually needed, which should not be exceeded. Corduroy makes the most durable suit for fishing, as a dark color does not show dirt, and

the cloth is difficult to tear. Have knickerbockers rather than bloomers made, as branches and twigs may catch the voluminous baggy knees, thereby tearing them. One pair is sufficient, together with coat and vest. Two suits of underclothing, two pairs of stockings, and a sweater complete the principal outfit. Necessaries in the way of handkerchiefs, towels, comb and brush, razor, small looking-glass, shaving brush, tooth brush and powder, are added. One suit of underclothes and one pair of stockings can be easily washed out when the others are in use. By all means wear a tam o' shanter, as it affords excellent protection from rain, sun, or cold, and makes a good night cap in cold weather. Also of value is a pair of low canvas, rubber-bottom tennis shoes, to wear about camp when boots or shoes are removed. The above list is all that is necessary, and reduces the amount of personal baggage to a minimum.

Only a few hints on camping can be given in a limited space, the subject being worthy of a volume by itself. But perhaps a sufficient general idea has been given to enable one to make a first attempt in a comfortable way. For the rest, experience is the best teacher, and one soon learns to know all the minor things that go far to make a sojourn in camp delightful.

CHAPTER XVII

SPECIAL HINTS FOR ANGLERS



A fisherman photographer.

THERE are a number of general hints not embodied in the preceding chapters that should be noted by those intending to become anglers. As they pertain to varied subjects, they can properly be treated in a chapter by themselves.

As reference has been made to those summer pests, mosquitoes, black flies, and other winged insects, it is well to give a recipe for keeping them at a proper distance. Everyone naturally recommends pennyroyal, citronella, and tar oil. All are good in their way, but not sufficiently so. The two former offer perfect immunity while they last, but, as they are essential oils, they evaporate quickly, and must be used every fifteen or twenty minutes. Tar oil, composed of tar and sweet oil, is also good, but, as it does not harden when applied to the skin, it is rubbed

off readily, thus leaving many spots open to attack. Absolutely the best protection is afforded by tar and vaseline. The proper proportions are two thirds pure tar and one third vaseline, which should be thoroughly mixed. This must be kept in large-mouthed bottles for convenient use. A single thorough application a day, unless one perspires freely, is sufficient, and it washes off easily with cold water and soap, leaving no stain. A few moments after application it becomes tacky, and in ten minutes hardens so that nothing can rub it off. It will keep all winged pests at a distance.

In regard to artificial baits, such as imitation minnows, frogs, crabs, dobsons, etc., they are not to be recommended. While at times they may attract an occasional fish, they will not bring sufficient return to pay for the expense of purchasing them. If natural bait does not succeed, imitations will certainly fail. They are very good in theory, but very poor in practical results.

A great fault with fishermen, even those of much experience, is the lack of care given to tackle, no matter how expensive it may be. Rods, especially, should receive close attention. When fishing is finished for the season, they should be taken from their cases, and, if sprung out of shape, jointed and hung up by the end of the tip for the winter. Their

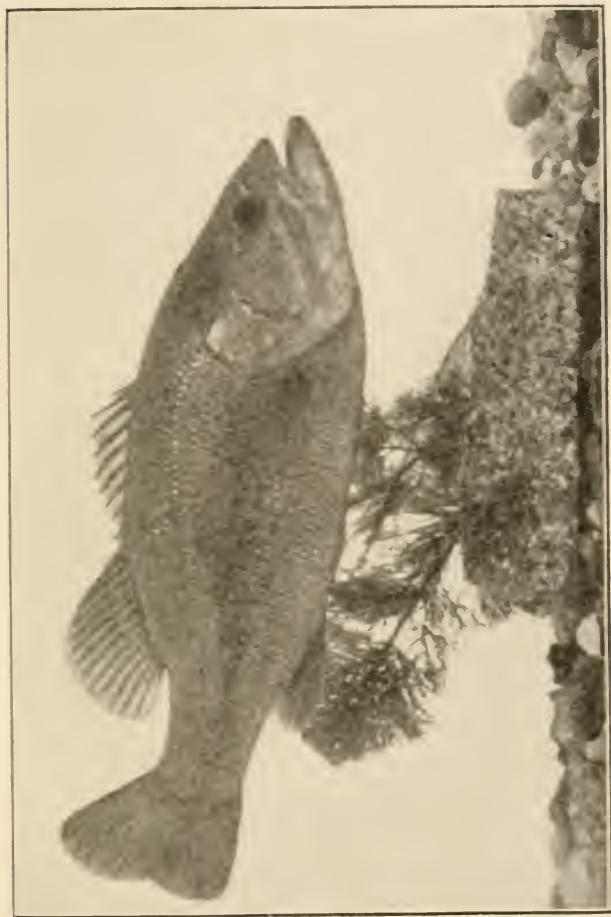
own weight will straighten them out. In addition, they will dry out thoroughly, so that they can receive a good coat of varnish in the spring, which should always be given them. Spar varnish will be found to be the most elastic and lasting. Lines should be wound from reels on blocks, and the reels properly oiled. Fly books should be placed out of reach of moths, and a little camphor packed with them. The leader box must be dried out, and anything liable to rust coated with oil. A little care will avoid loss and the unnecessary expense of replacing tackle spoiled through lack of it.

Especial care should be taken in using split bamboo rods. The most necessary rule to observe is to change tips constantly, in order that they may not become water-soaked from too long service, as this causes them to untwist and break. A change should be made at least twice a day. Never leave rods out in the rain; always keep them under cover and dry.

A rule to be closely observed, but generally neglected, is always to examine all tackle, particularly lines, leaders, flies, and snell hooks, before using in the spring. With the best of care, age will weaken them so that they will break easily, especially in the case of gut. It is far from pleasant to lose a fish through faulty tackle, which an examination would have discovered and thrown aside. In fact, leaders,

flies, and hooks should always be tested by a good strain and sharp jerks before use.

In the present age, photography has been added to the necessary acquirements of the fisherman. Not only can beautiful bits of scenery be preserved, but also the scenes of happy outings, circumstances connected with them, and especially noted catches of fish. Photographs of fish caught will prove to be of the greatest value, since by showing them one is always able to prove any fish stories told. All stories of catches, no matter how truthful, are doubted nowadays; hence the necessity of authentication. It is well to know that in photographing fish something should always be placed in the picture to give an idea of their size. A rule, hat, net, rod, or something of that sort, proves the size of the fish caught beyond question. Be sure to have this article at the same distance from the camera as the fish. To secure the best results in taking pictures, glass plates should be used instead of films, notwithstanding their inconvenience. The old-fashioned cap-off-and-on exposure will be found better than the shutter, except where motion is to be taken. Photography in the woods is most difficult, and time exposures not given by a shutter secure better results. Considerable practice in forest photography is necessary to insure satisfactory results, as the shadows from the trees are very dense.



Bass swimming (from life).

In stream fishing for trout hooks and lines are frequently caught in the overhanging trees. A so-called "releaser" is shown in the accompanying cut, and should be included in the tackle box. The tip of the rod is inserted under the rubber band placed about the base, and with it the releaser can be elevated to the branch where the hook is caught. Being placed above, the rod is pulled out, and a sharp tug on the string attached cuts the branch and releases the hook. This saves hooks, time, and especially temper, and at the same time prevents scaring the fish.



A releaser.

Three kinds of fish are, or should be, skinned in dressing them for cooking. The bullhead is always so treated, as it is a skin not a scale fish.

Its skin is not only tough, but serves to retain the natural unpalatable fat that it carries in great quantity. It is now a well-known fact that black bass have a much finer flavor if skinned before frying or broiling. There is a decidedly bitter taste to the skin that can thus be avoided. The yellow perch should always be skinned, not only to improve its flavor, but because it is necessary. Being a small fish they are

difficult to scale, making the work slow. There is a knack in skinning perch that is easily learned. A strong knife and the pliers from the tackle box are required. An incision, about half an inch deep, is made on each side of the backbone from head to tail, and the skin cut all around just back of the head. With the pliers the skin is taken at the circular cut, and a quick, sharp pull will tear it off entire from one side. The operation is then repeated on the other. The cuts along the back loosen the dorsal fin, which is pulled out, the entrails are removed, and the head cut off. With a little practice a fish can be cleaned quicker than this can be related. The same method is followed in skinning bass and bullheads.

Special care should be taken to know thoroughly the location of the various fishing places in a radius of twenty-five miles or more from one's home, and every effort made to learn the best spots to fish in each. Having learned from the preceding chapters the habits of fish and the particular places where they should be found, one can know just where to fish and obtain success. Rivers and lakes should be surveyed, and likely spots fished over carefully. Fishing at random is useless and time lost; practical judgment is absolutely necessary to make a successful fisherman. The practice of the virtue of patience

must not be overlooked, since if fish will not bite even when tempted in all ways, one must await their pleasure. Often it is only after repeated trials that the value of a promising spot can be decided.

The Canadian Government now obliges intending nonresident fishermen to obtain a license or permit before fishing in any waters of the Dominion. This does not apply to the St. Lawrence River, however. The license costs \$5 for three months, and \$10 for six months, is nontransferable, and must be renewed annually. Members of any fishing club located in that country are exempt. A local fishing warden will be found in each district to demand and issue licenses.

The illustration of a fish found on the opposite page shows clearly the proper name applied to each fin, as well as to the different parts of the body. While it is not absolutely necessary to know the various names applied to the fins, it is well to learn them, as constant references are made to them in almost all books on fishing.

There is never any necessity for ignorance of the points of the compass when in the woods—that is, during daylight—as Nature provides several methods of determining them. Nearly all trees will be found to have a strip of moss along the trunk. It is a known fact that in three quarters or seven

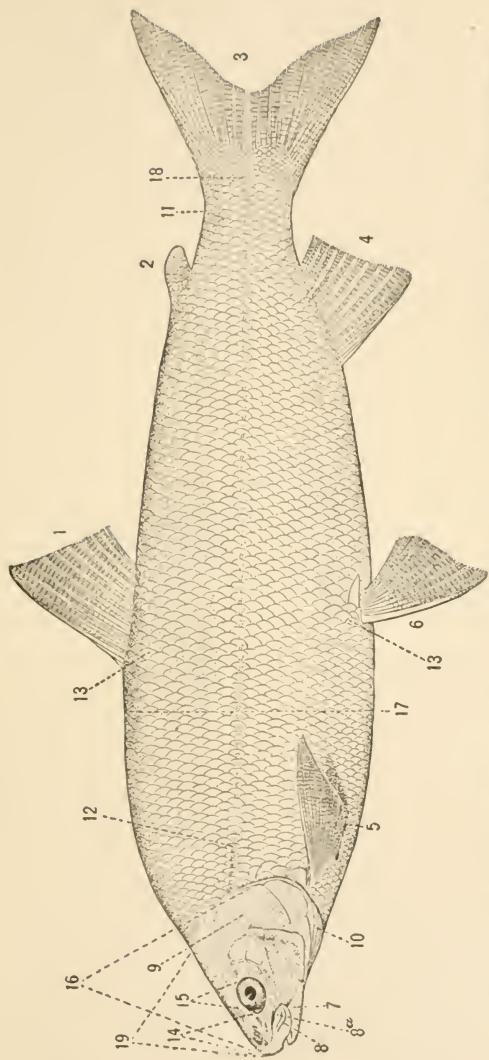


FIGURE OF A FISH, SHOWING THE LOCATION OF PARTS USUALLY REFERRED TO IN DESCRIPTIONS.

- | | | | |
|------------------|--|---|---|
| 1. Dorsal fin. | 7. Lower jaw, or mandible. | 11. Caudal peduncle. | 15. Eye. |
| 2. Adipose fin. | 8. Upper jaw, or maxillary. | 12. Lateral line. | 16. Head. |
| 3. Caudal fin. | 8 ^c . Supplemental maxillary. | 13. Series of crosswise scales usually counted. | 17. Depth. |
| 4. Anal fin. | 9. Opercle. | 14. Snout. | 18. Base of caudal. |
| 5. Pectoral fin. | 10. Branchiostegals. | | 19. Distance from snout to nape or occiput. |
| 6. Ventral fin. | | | |

eighths of the cases it is on the north side. By noting several trees, the majority having the moss on the same side will indicate that direction. By closely observing spruce trees, it will be found an invariable rule that the heaviest branches are on the south side. The Canadian Indians also claim that on every perfect hemlock tree the topmost twig bends to the east. Another perfect compass can be devised with a watch. Point the hour hand directly at the sun, and exactly halfway between that hand, wherever it may be, and the figure XII on the dial, lies the south.

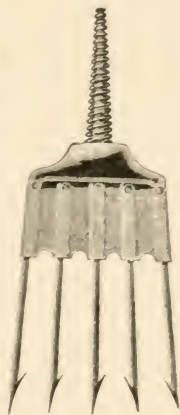
A very useful table to determine the weight of brook trout, which is practically correct, is as follows:

13	inches	long,	weight	1	pound
14	"	"	"	$1\frac{1}{4}$	pounds
15	"	"	"	$1\frac{1}{2}$	"
16	"	"	"	$1\frac{3}{4}$	"
17	"	"	"	$2\frac{1}{4}$	"
18	"	"	"	$2\frac{1}{2}$	"
19	"	"	"	3	"
20	"	"	"	$3\frac{1}{2}$	"
21	"	"	"	4	"
22	"	"	"	$4\frac{3}{4}$	"
23	"	"	"	$5\frac{1}{2}$	"

When trolling with a spoon, spinner, or gang, it should be drawn in and constantly examined, as pieces of loose grass or weeds are frequently caught without the fact being known. A small piece trail-

ing from the hook renders the bait useless. In still fishing the bait should often be examined, to see that nothing is attached to it, and that it is uninjured. Hooks of all kinds should be looked over closely, as the points often are broken or bent. A file remedies this trouble. They should also be kept clean and free from rust through the medium of emery cloth, a piece of which should be in the tackle box. A little metal polish and a piece of flannel also added to the box will be found useful in keeping spoons and spinners bright.

The shores of nearly all lakes and rivers throughout the country abound with frogs, whose hind legs, properly cooked, form a dish noteworthy for its excellence. They can be secured with a hook, by spearing, or may be killed with a heavy stick. When they are found plentifully in the water, a hook fastened to a short line, tied to a stiff pole, and baited with a piece of red flannel captures them readily. A frog spear secures



A frog spear.

them more quickly, but practice is required to handle it. All grassy meadows adjoining rivers and lakes will be found to contain many frogs during the summer and fall. Here the stick comes into play. No

matter how caught, all should be killed at once with a blow on the head. The bone that fastens the hind legs to the body is severed with a strong-bladed knife. Grasping the severed skin between the edge of the blade and the thumb, a sharp pull removes it entire, and the legs are ready to be cooked. Always throw the remains of the frogs into the water to prevent their decaying about the camp.

The average camp cook confines himself entirely to either frying or broiling fish, which, after a few meals, causes the dish to be disliked. Variety in the methods of cooking will avoid this trouble. As already said, a most excellent way to prepare either small fish, or large ones cut into good-sized pieces, is to place them in a covered pail or kettle of hot water over the fire, and, adding a generous piece of pork, allow them to boil about half an hour. The pork will season the fish excellently. The finest method of all, however, is to bake a fish in the sand. Not only is the whole flavor and all the juice preserved, but the operation is quickly performed. A fire of ample size is built on the sand, sufficient to heat it to a depth of a foot or more, and is kept burning at least an hour. A good-sized fish of any kind is cleaned, thoroughly washed, and two or three tablespoonfuls of butter, with salt and pepper, placed inside. The sides of the belly are then folded

tightly one over the other, and a piece of string wound about the entire fish. It is then rolled in several thicknesses of heavy brown paper, birch bark, or cloth, and again tightly tied about with string. The embers of the fire are brushed aside and a hole dug in the hot sand about a foot deep. The fish is quickly placed in it, the sand scraped over it, and a few embers placed on top to continue the heat. Twenty minutes will cook the fish, and an unrivaled feast is ready.

To preserve fishing boots and shoes properly, keep them soft, and absolutely waterproof, nothing can equal pure cod-liver oil. It seems to penetrate deeper, and is so heavy-bodied that it lasts. Several applications should be made, and each allowed to dry in by holding the boot over the fire. If one is in the water much, the oiling should be repeated every two or three days.

Experience shows that the best hours of the day for fishing are those of the early morning and of the late afternoon, continuing until dusk. If the weather is rainy, cloudy, or dark, equal success may be met with throughout the day, but it is the exception, not the rule, to find good fishing during the bright noonday hours.

Do not forget to provide an anchor of some kind, as it will be found necessary on every fishing trip.

A large stone that will hold a rope tied about it, or a large piece of scrap iron, will each prove excellent. If the weather is at all windy and still fishing is to be done, two anchors should be provided, one each at bow and stern, to keep the boat from constantly swinging about.

Mist or dark-colored leaders are always the best to use, being less noticeable in the water. If one is unable to secure them, it is a very simple matter to prepare a stain. This is effected by soaking them over night in a strong solution of either coffee or tea. A weak solution of logwood, with a little alum added, is also very good. Avoid the use of light-colored leaders

When it is desired to preserve fish for several days, and ice can not be obtained, they should be wiped perfectly dry inside and out and packed in moss. One should not be allowed to touch another. The blood must be carefully cleaned from the inside along the backbone, and a little salt and sugar, or salt and soda rubbed in the interior. Fish can be kept quite a long time by burying them a foot deep in moss, under the roots of a tree, in a well-shaded spot.

Snow or finely shaved ice will melt much slower, and therefore preserve fish much longer, than will ice broken into ordinary-sized pieces. It should be

packed very hard, to prevent the circulation of air through it.

It is a good idea always to examine the stomachs of all fish caught, and note what particular food they are taking. It will aid materially in making a good catch, when a random choice of baits or flies does not succeed.

CHAPTER XVIII

COMPRISING A CHAPTER ON DON'TS

ALL that has been said thus far in this book indicates what one should do to become a fisherman. It is necessary now to call attention to many things that one should not do. A large number of these don'ts pertain to personal safety, and call for careful observance.

Don't go out in a small boat tightly wrapped up in heavy overcoats, and, above all, never wear high rubber boots on such a trip; in case of an accident the most powerful swimmer would be drowned. If heavy clothing is necessary, be ready to throw it off in a moment. The boots are never needed in a boat; if they are to be used on shore, they can be easily put on when required. A leather coat, wool lined, worn over a sweater, and heavy underclothing, afford ample warmth, and will not interfere materially with swimming.

Don't change seats in a boat unless absolutely compelled to; attempts to do this have caused more

drowning accidents than any other one thing. It is safer and better to go ashore, if possible. If a change must be made, the one in the stern should move carefully to the middle seat and sit there, quietly balancing the boat, while the one rowing slowly passes him on hands and knees. Not until he is seated in the stern should his companion move to the front seat to take the oars.

Don't use unsafe boats of any kind. Those that are too small, cranky, rotten, or leaky are to be avoided. Too many chances are taken by fishermen in this respect, with the result that too many unnecessary accidents result. A boat that is too small or cranky can not stand heavy waves, and a quick, accidental movement may overturn it. Rotten and leaky boats are generally dangerous.

Don't under any circumstances lean too far over the side of a boat, either in recovering something dropped in the water or in netting a fish; it often results in falling overboard or tipping over. Guard against this fault in every way, as it is an especially bad one.

Don't stand up in a small boat, no matter what occurs, as it is the very acme of carelessness. All weight must be kept as near the bottom of the boat as possible.

Don't attempt to sail a rowboat with a regular or

improvised sail unless you have a thorough knowledge of how to do it. It is, unfortunately, a most common practice, but nothing can be more dangerous.

Don't attempt, when alone, to row a boat in rough water and to fish with a rod or troll at the same time. In such a case the management of the boat demands undivided attention.

Don't be careless in getting in and out of a boat, especially where the water is deep, as a misstep means a plunge overboard. Always draw a boat well up on shore when not in use, as a sudden wind and high waves will otherwise easily drift it away.

Don't, under any circumstances, take a loaded gun into a boat, unless it be one with the shells or cartridges in the magazine, not in the barrel. A lurch of the boat may throw the gun to the bottom and explode it, killing some one, or blowing a hole through the bottom.

Don't ever follow the dangerous practice of rowing your boat as near a passing steamboat as possible in order to catch the resulting swells. They are very dangerous, and even with skillful management often cause a boat to be overturned.

Don't ever sit in a rowboat when having it towed behind a steamer. A sudden lurch or turn might throw the occupant out or capsize it.

Don't forget to keep a careful lookout for snags or stones just below the surface when rowing a boat. There is a possibility of knocking a hole through the bottom, but the more common danger lies in the fact that the boat usually runs upon the obstruction and rocks badly with the effort to get it off.

Don't ever approach closely to any hunters, especially when they are walking along the shore. This will prevent any danger of being shot, and at the same time avoid the possibility of frightening any game they may be seeking.

Don't ever leave a fire in the woods, no matter how small, either when leaving camp temporarily or permanently. It may creep along the ground, or a strong wind may blow the sparks about, causing the burning of the camp, or even a disastrous forest fire. Make a mental note always to extinguish the fire or embers with a pail of water.

Don't ever trespass on waters or grounds preserved by individuals or clubs, as it may lead to arrest and considerable trouble. Moreover, from a moral point of view it should not be done. Treat others as you would have others treat you, no matter how great the temptation, and how much better the fishing may be there.

Don't violate the game laws. This means much, and is a subject worthy of a lengthy sermon. The

fish laws are founded upon the necessity of protecting fish during the spawning season, and their disregard means the killing of hundreds of fish for each one taken. The true sportsman will observe the close seasons for fishing as readily as he will any moral obligation. The necessity for protecting fish when spawning has been fully explained in the chapter on hatching and propagating, and especial attention is called to it here. Do not, under any circumstances, break the law. The open season is sufficiently long to afford ample sport. Maintain also the law in regard to taking undersized fish. The illegal sizes are too small for the table, and no honor accrues from taking them. Above all, never take more of any kind of fish than are actually required. There are many times when fish bite readily, and the temptation is to catch as many as possible. As has been stated in a previous chapter, if one simply can not withstand the temptation the fish should be thrown back into the water, only those badly injured being kept. This affords ample sport without slaughter. Don't throw back fish that are badly injured and liable to die. It is more humane to kill them at once, and to keep them, even if caught accidentally out of season. Certain directions should be given in this regard, however. Especial care must be taken in throwing back trout that have been caught, to wet the hand

thoroughly before taking hold of the fish to remove it from the hook. A dry hand removes sufficient of its natural slime to cause it to die eventually. This slime affords the trout a protection absolutely necessary to its life.

Don't ever endeavor to prevent others from fishing on the same grounds with you, as they have equal rights. If they lack gentlemanly instincts, do not under any circumstances forget that you are a sportsman, and to carry out the honorable methods properly attributed to one.

Don't fail to assist others to secure good sport through refusing to give necessary and correct information. Remember that at times such information has been or will be of great service to yourself. Moreover, the first obligation of a sportsman is to do all in his power to aid his fellows.

Don't ever begin to unjoint a rod by first pulling the second joint from the butt. Commence by removing the tip, and then the second joint. Unless this is done, the sudden separating of the joints may drive the tip against some object and break it.

Don't forget to always take a necessary quantity of worms for bait when going into the woods to seek the early spring trout-fishing. It is rarely that they can be obtained there. Worms make absolutely the best bait at that season, being, as it is, too early for flies.

CHAPTER XIX

OPEN FISHING SEASONS IN UNITED STATES AND CANADA

THE following table gives the open seasons for taking game fish, as adopted by the various States and in the several parts of Canada. This includes all changes made up to and during the year 1899. In several States, notably Maine, Michigan, New York, Ohio, Vermont, and Wisconsin, there are certain waters excepted from the general law, each bearing a special open season, or closed entirely. For this reason it is better to consult the game laws of those States before fishing, noting the many exceptions and special acts.

It will be remarked that the time allotted to open seasons for the same variety of fish in the various States differs greatly. This is not owing altogether to the differences in the spawning season caused by changes in climate or temperature, but rather to faulty laws. In some localities the laws as they now stand do not afford any protection at all, which, it is

to be hoped, will be rectified before it is too late. Beyond question New York and Maine have given the matter of fish protection the closest attention, and their laws, as they now stand, are nearly perfect. Without unduly depriving the angler of sport, they do protect fish during the spawning season, erring, if at all, on the side of safety.

In some of the States, the fish laws are more honored in the breach than in the observance—in fact, are practically not enforced at all. The necessity of enforcement will become apparent before long from a diminished fish supply, and then more stringent measures will be taken.

The names of the various States will be found noted in the left-hand margin of the table following, and in the column bearing the name of the various fish will be found the dates covering the opening and closing days of the open season.

UNITED STATES

	Salmon.	Land-locked Salmon.	Trout.	Lake Trout.	Black Bass.	Muskallunge, Pike, Pickerel.	Pike Perch.
Alabama.....		No	close	seasons.			
Alaska.....		No	close	seasons.			
Arizona.....			June 1st to Sept. 1st.				
Arkansas.....		No	close	seasons.			
California.....	Nov. 15th to Oct. 15th.		Apr. 1st to Dec. 1st.	Apr. 1st to Nov. 1st.	July 1st to Jan. 1st.	No law on steelhead trout.	
Colorado.....			June 1st to Oct. 31st.				
Connecticut.....			Apr. 1st to July 1st.		July 1st to May 1st.	12 in limit.	12 in limit.
Delaware.....		No	close	seasons.			

District of Columbia.					June 1st to Apr. 1st.			
Florida.....	No	close	seasons.					
Georgia.....	No	close	seasons.					
Idaho.....	All	fish	May 1st		to	Nov. 1st.		
Illinois.....		Apr. 1st to July 15th.						
Indiana.....	All	fish	July 1st		to	May 1st.		
Indian Territory.....	No	close	seasons.					
Iowa.....		Mch. 1st to Nov. 1st.	Mch. 1st to Nov. 1st.		May 15th to Apr. 1st.	May 15th to Apr. 1st.		May 15th to Apr. 1st.
Kansas.....		May 1st to Mch. 15th.	May 1st to Mch. 15th.		May 1st to Mch. 15th.	May 1st to Mch. 15th.		May 1st to Mch. 15th.

UNITED STATES—(Continued)

	Salmon.	Land-locked Salmon.	Trout.	Lake Trout.	Black Bass.	Muskallunge, Pike, Pickerel.	Pike Perch.
Kentucky.....		No	close	seasons.			
Louisiana.....		No	close	seasons.			
Maine.....	Apr. 1st to Sept. 15th.	Leaving of ice to Oct. 1st.	Leaving of ice to Oct. 1st.	Leaving of ice to Oct. 1st.	No open blueback	season on trout.	
Maryland.....			Apr. 1st to Aug. 15th.		June 1st to Apr. 15th.	June 1st to Apr. 15th.	June 1st to Apr. 15th.
Massachusetts.....	May 1st to Aug. 1st.	Apr. 1st to Sept. 1st.	Apr. 1st to Sept. 1st.	Apr. 1st to Sept. 1st.	June 1st to Dec. 1st.		
Michigan.....		May 1st to Sept. 1st.	May 1st to Sept. 1st.				
Minnesota.....		May 1st to Sept. 1st.	May 1st to Sept. 1st.	May 1st to Mch. 1st.	May 15th to Mch. 1st.	May 1st to Mch. 1st.	May 1st to Mch. 1st.
Mississippi.....		No	close	seasons.			

Missouri.....		No	close	seasons,			
Montana.....		No	close	seasons,			
Nebraska.....		No	close	seasons,			
New Hampshire.....	Apr. 15th to Sept. 30th.	Apr. 15th to Sept. 30th.	Apr. 1st to Aug. 1st. Apr. 1st to July 15th.	Apr. 1st to Aug. 1st.	June 15th to Apr. 30th. May 30th to Dec. 1st.	June 1st to Apr. 1st. May 1st to Feb. 20th.	July 1st to May 1st.
New Jersey.....							
New Mexico.....			June 1st to Nov. 1st.	June 1st to Nov. 1st.	July 1st to Feb. 1st.		
New York.....	Mch. 1st to Aug. 15th.	May 1st to Sept. 30th.	Apr. 16th to Aug. 31st.	May 1st to Sept. 30th.	June 15th to Dec. 31st.	May 1st to Feb. 28th.	May 1st to Feb. 28th.
Nevada.....		June 1st to Oct. 1st.	June 1st to Oct. 1st.	May 1st to Jan. 1st.			
North Carolina.....			Dec. 31st to Oct. 15th.				

UNITED STATES—(Continued)

	Salmon.	Land-locked Salmon.	Trout.	Lake Trout.	Black Bass.	Muskallunge, Pike, Pickerel.	Pike Perch.
North Dakota.....			May 1st to Nov. 1st.	May 1st to Nov. 1st.	May 1st to Nov. 1st.	May 1st to Nov. 1st.	May 1st to Nov. 1st.
Ohio.....		Mch. 15th to Sept. 15th.	Mch. 15th to Sept. 15th.		June 15th to May 1st.		Mch. 14th to Sept. 15th.
Oregon.....			Apr. 1st to Nov. 1st.				
Pennsylvania.....	Mch. 1st to Aug. 15th.		Apr. 15th to July 15th.	Jan. 1st to Oct. 1st.	June 1st to Jan. 1st.	June 1st to Feb. 1st.	June 1st to Jan. 1st.
Rhode Island.....			Apr. 1st to July 15th.		July 1st to Mch. 1st.		
South Carolina.....		No	close	seasons.			
South Dakota.....			May 1st to Oct. 1st.		May 1st to Oct. 1st.		
Tennessee.....		No	close	seasons.			

	No	close	seasons,			
Texas.....		June 14th to Dec. 15th.		June 14th to Dec. 15th.		
Utah.....						
Vermont.....	May 1st to Sept. 1st.	May 1st to Sept. 1st.	May 1st to Sept. 1st.	June 15th to Jan. 1st.	Muskallunge, June 15th to Apr. 15th.	May 1st to Jan. 1st.
Virginia.....		Apr. 1st to Sept. 15th.		July 1st to May 15th.		
West Virginia.....	Jan. 1st to Sept. 1st.	Jan. 1st to Sept. 1st.		June 15th to Apr. 15th.	June 15th to Apr. 15th.	June 15th to Apr. 15th.
Wisconsin.....		Apr. 15th to Sept. 1st.	Apr. 15th to Sept. 1st.	May 25th to Mch. 1st.	May 25th to Mch. 1st.	May 25th to Apr. 1st.
Wyoming.....	May 1st to Nov. 1st.	May 1st to Nov. 1st.				

CANADA

	Salmon.	Land-locked Salmon.	Trout.	Lake Trout.	Black Bass.	Muskallunge, Pike, Pickerel.	Pike Perch.
New Brunswick.....	Mch. 1st to Aug. 15th.	May 1st to Sept. 15th.	May 1st to Sept. 15th.	May 1st to Sept. 15th.			
Nova Scotia.....	Feb. 1st to Aug. 15th.	Apr. 1st to Oct. 1st.	Apr. 1st to Oct. 1st.	Apr. 1st to Oct. 1st.			
Newfoundland.....	Jan. 15th to Sept. 10th.	Jan. 15th to Sept. 10th.	Jan. 15th to Sept. 10th.	Jan. 15th to Sept. 10th.			
Prince Edward Island			Dec. 1st to Oct. 1st.	Dec. 1st to Oct. 1st.			
Province of Quebec..	Feb. 1st to Aug. 15th.	Dec. 1st to Sept. 15th.	Apr. 30th to Oct. 1st.	Dec. 1st to Oct. 15th.	June 15th to Apr. 15th.	Muskallunge. July 1st to May 25th.	May 15th to Apr. 15th.
Province of Ontario..			May 1st to Sept. 15th.	Nov. 30th to Nov. 1st.	June 15th to Apr. 15th.	Muskallunge. June 15th to Apr. 15th.	May 15th to Apr. 15th.
Manitoba.....			Jan. 1st to Oct. 1st.				May 15th to Apr. 15th.

CHAPTER XX

SCIENTIFIC NAMES OF FISH MENTIONED

IN nearly all publications relating to fish, the Latin or scientific name of each is usually given immediately following the English appellation. In this work this method has not been followed, as it seemed preferable to give the subject a chapter to itself. In this manner the fish mentioned can be kept together in groups or families, and the distinctive family and varietal name of each readily seen and learned. This allows, as well, opportunity and space to give the derivation and meaning of each. It is well to know all this, for the reason that these names are constantly used. They are, indeed, a necessary part of a fisherman's knowledge. The salmon (pronounced sam'un) family, being most prominent, is given first, and the other fish are given in the order followed in the preceding chapters.

Salmo salar: common Atlantic salmon. *Salmo* and *salar* are old Latin names for this family of fish, both derived from *salio*, to leap, and doubtless were corrupted or changed from

the originals in being handed down. The word *salmo* is used in connection with a large variety of the trouts, to designate the family or descent. It is the first name given, as is the case with all other kinds of fish, being the specific name indicating the species. The other names following are subspecific, expressing a variety.

Oncorhynchus: the Pacific varieties of salmon. From *ογκος*, hook; *ρυγχος*, snout. The word *salmo* is not applied to this great branch of the salmon family in the scientific name, but they bear instead the specific name given above.

Oncorhynchus tshawytscha: king or quinnat salmon. *Tschawytscha* is the vernacular name for this fish among the natives of Alaska and Kamchatka.

Oncorhynchus nerka: red or blueback salmon. *Nerka* is a Russian name applied to this variety.

Oncorhynchus kisutch: silver salmon. *Kisutch*, the Alaskan and Kamchatkan vernacular name.

Oncorhynchus gorbuscha: humpback salmon. *Gorbuscha*, the Russian vernacular name in Alaska.

Oncorhynchus keta: dog salmon. *Keta*, a vernacular name in Kamchatka.

Salmo or Salvelinus fontinalis: the common brook or speckled trout. *Salvelinus*, an old name for the char. *Fontinalis*, living in springs. In this connection it is well to know that among the trouts *salmo* is applied to the rainbow, brown, cut-throat, Tahoe, and steelhead; while *salvelinus* represents the brook, red-spotted or Dolly Varden, blueback, saibling, and Sunapee varieties.

Salmo irideus: rainbow trout. *Irideus*, rainbow-like.

Salmo fario: brown trout. *Fario*, European varietal name.

Salmo mykiss: cut-throat trout. *Mykiss*, a vernacular name for this species in Kamchatka.

- Salmo mykiss Henshawi**: Tahoe trout. *Henshawi*, named for H. W. Henshaw, who discovered this fish.
- Salmo Gairdneri**: steelhead trout. *Gairdneri*, named for Dr. Gairdner, who discovered it.
- Salvelinus malma**: red-spotted, or Dolly Varden trout. *Malma*, a vernacular name for this fish in Kamchatka.
- Salvelinus Oquassa**: blueback trout of Maine. *Oquassa*, name of one of the Rangeley lakes.
- Salvelinus Alpinus**: saibling. *Alpinus*, Alpine.
- Salvelinus Alpinus aureolus**: Sunapee trout. *Aureolus*, golden.
- Cristivomer namaycush**: lake trout. *Cristivomer*, from *crista*, crest; *vomer*, vomer; meaning a slender, thin bone separating the nostrils. *Namaycush*, an Indian name applied to this fish.
- Thymallus Ontariensis**: Michigan grayling. *Thymallus*, an ancient name for grayling, the fish having the odor of thyme. *Ontariensis*, of or pertaining to Lake Ontario.
- Salmo salar ouananiche McCarthy**: ouananiche, or so-called landlocked salmon of Canada. *Ouananiche*, Montagnais Indian vernacular meaning little salmon. *McCarthy*, so named from his first writing fully regarding this fish.
- Salmo salar (ouananiche) Sebago**: landlocked salmon of the United States. *Sebago*, name of a noted Maine fishing lake, where this species was first found.
- Sea trout**. There is no especial name for these fish. As previously stated, nearly all trout can live in salt water, and do run down to it when the streams they inhabit are tributary to the sea. Naturally they bear the same names when found in salt water.
- Micropterus Dolomieu**: small-mouthed black bass. *Micropterus*, small fin. Improperly named, for the reason that the original specimen to which the name was given had the dorsal fin injured. The posterior rays being detached and broken

off short were taken for a separate fin. *Dolomieu*, named for M. Dolomieu, of Paris.

Micropterus salmoides: large-mouth black bass, Oswego bass. *Salmoides*, troutlike. This fish is often called a "trout" in the Southern States, being troutlike in gameness and in quality as food.

Pomoxis sparoides: calico bass, strawberry bass. *Pomoxis*, sharp opercle, the opercle ending in two flat points instead of an "ear flap." *Sparoides*, from *σπαρος*, *sparus*; *ειδος*, resemblance.

Ambloplites rupestris: rock bass, red eye, goggle eye. *Ambloplites*, blunt armature. *Rupestris*, living among rocks.

Roccuschrysopterus: white bass, striped bass, silver bass. *Roccus*, from the vernacular, rock fish. *Chrysopterus*, gold eyed.

Lucius masquinongy: muskallunge. *Lucius*, the Latin name for pike. *Masquinongy*, the Indian name given this fish, supposed to indicate hard fighting. Old name, infrequently used, *Esox nobilior*.

Lucius reticulatus: pickerel. *Reticulatus*, netted. Old name, infrequently used, *Esox reticulatus*.

Lucius lucius: pike. Old name, infrequently used, *Esox lucius*.

Stizostedion vitreum: pike perch, wall-eyed pike, yellow pike. *Stizostedion*, pungent throats. *Vitreum* (*vitreus*), glassy, from their large eyes.

Perca flavescens: yellow perch, ringed perch, striped perch. *Perca*, the ancient name of the fish. *Flavescens*, yellowish.

Morone Americana: white perch. *Morone*, name unexplained. *Americana*, American.

Cyprinus carpio: scale carp. *Cyprinus*, the ancient name of the carp. *Carpio*, carp.

Cyprinus carpio coriaceus: leather carp. *Coriaceus*, leathery.

Ameiurus nebulosus: bullhead. *Ameiurus*, curtailed; the caudal fin not notched. *Nebulosus*, clouded.

- Ameiurus lacustris**: catfish of the lakes, Mississippi cat. *Lacustris*, living in lakes.
- Ameiurus catus**: channel cat. *Catus* (low Latin), cat.
- Aplodinotus grunniens**: sheepshead, fresh-water drum. *Aplodinotus*, single back. *Grunniens*, grunting.
- Lota maculosa**: burbot, lawyer, ling. *Lota*, an ancient name given this fish from the French *la lotte*. *Maculosa*, spotted.
- Coregonus clupeiformis**: whitefish. *Coregonus*, old Latin name for whitefish. *Clupeiformis*, shad or herring shaped.
- Osmerus**: smelt. *Osmerus*, odorous. The name is the same as the English "smelt."

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INDEX

- Anchor, 191, 192.
Angle worms, 119, 120, 199.
- Bait box, 121.
Baits, artificial, 180.
Basket fish, 99, 121.
Bass, black, 11, 15, 41, 42, 44, 45, 46, 48, 54, 184, 211, 212; fishing for, 136-138, 140-145; Oswego, 44; rock, 41, 42, 50, 52, 212; strawberry or calico, 41, 42, 48, 50, 212; white, 41, 52, 144, 212.
- Bed, camp, 169.
Blanket, rubber, 175.
Boats, dangers to avoid in, 194-197.
Bullheads, 7, 67, 77, 78, 184, 212; fishing for, 161, 162.
- Burbot, or ling, 67, 80, 82, 213; fishing for, 163.
- Camp, bark, or open, 168, 169.
Camp fire, 170, 172, 197.
Camping, 164, 178.
Camping list, 172-176.
Canadian licenses, 186.
Carp, fishing for, 161; leather back, 67, 73, 75, 77, 212; mirror, 73; scale, 7, 67, 73, 75, 77, 212.
- Casting with minnows, 141.
Catfish, 18, 67, 77, 78, 213; fishing for, 162.
Chars, 30, 31.
Chubb, 84.
Ciscoes, 30.
Cleaning salmon and trout, 122.
Clothing, 177, 178.
- Compass, Nature's, 186-189; watch, 188.
Cooking, 176, 177, 190, 191.
Cusk, 80.
- Disgorger for hooks, 157.
Dorè, 64.
Drum, or sheepshead, 67, 78, 80, 213; fishing for, 162.
- Eel pout, 80.
Eggs, fish, 6-8, 10, 12-14.
- Fire, danger from, 197.
Fish basket, 99, 121.
Fish, cleaning of, 122, 184; fighting qualities of, 44, 45, 126, 127; names of parts and fins of, 186.
Fishing, locations for, 185; time of day for, 191.
Fish laws, violation of, 3, 4, 123, 197.
Fish way, 8, 9.
Flies, 103, 130.
Flies, preventive against, 179, 180.
Fly fishing, 102, 130, 132, 137, 159.
Frogs, 189, 190.
Frog spear, 189.
- Gang of hooks, 148, 149.
Goode, George Brown, quoted, 39.
Grayling, 29, 30, 211.
Gut, tying, 100.
- Hatcheries, 9, 10.
Hatching, 10, 13, 15, 16, 70, 71; black bass, 15, 48; ouananiche, 36, 37; trout, 9, 11, 26.

216 FAMILIAR FISH, THEIR HABITS AND CAPTURE

- Herring, 30.
- Hooks, 86, 92, 93, 112, 121, 140, 143, 144, 148, 150, 188, 189.
- Ice fishing, 152, 160.
- Lake St. John, 32, 33, 166.
- Landing net, 93.
- Lawyers, 80, 213.
- Leaders, 86, 107, 112, 147, 149, 192.
- Licenses, Canadian, 186.
- Lines, 86, 90, 92, 103, 112.
- Ling. See Burbot.
- List for camping, 172, 176.
- Marston, R. B., quoted, 22.
- Minnnows, casting with, 141.
- Mosquitoes, preventive against, 179, 180.
- Muskallunge, 56-58, 66, 212; derivation of name, 57; distinguished from pike and pickerel, 58, 60-62; fishing for, 147, 148; where found, 146.
- Ouananiche, 32-37, 126-129, 211; fishing for, 126-129; hatching, 36, 37.
- Perch, ringed, 68, 212; striped, 68, 212; white, 67, 71-73, 212; fishing for, 160, 161; yellow, 67, 68, 70, 71, 184, 185, 212; fishing for, 158-160.
- Photography, 182.
- Pickerel, 56-58, 60-62, 66, 212; distinguished from muskallunge and pike, 58, 60-62; fishing for, 149, 156.
- Pike, 56-58, 61, 62, 66, 212; distinguished from muskallunge and pickerel, 58-62; fishing for, 149-156; names in various countries, 62; wall-eyed, 64; yellow, 64.
- Pike perch, 56, 57, 64-66, 212; fishing for, 156, 157.
- Pillow, rubber, 176.
- Preserves, fishing, 122, 123.
- Preserving fish, 192.
- Reels, 86, 89, 90, 103, 112.
- Releaser, 184.
- Rods, 86, 87, 100, 103, 108, 109, 111, 112, 120, 121, 127, 138, 140; unjointing, 199.
- Salmon, Atlantic, 18, 23, 111, 209, 210; fishing for, 111, 112, 114, 115; land-locked, 32, 33, 211; Pacific, 18, 20, 111, 210; where found, 18, 20, 111.
- Scientific names of fish, 209-213.
- Seasons, fishing, in Canada, 200, 201, 208; in the United States, 200-207.
- Sheepshead. See Drum.
- Smelts, 18, 213.
- Spawning, 6-12, 70, 73.
- Spinners, 93, 140.
- Spoons, trolling, 93, 94, 147-151, 156.
- Suckers, 7, 73, 75, 82.
- Sunfish, 54.
- Tackle box, 95-100.
- Tackle, care of, 180, 181.
- Tip-ups, 153-156.
- Trespassing, 197.
- Trolling, 188, 189.
- Trout, blue-back, 29, 210; brook, 7, 9, 11, 12, 18, 20, 22-24, 26, 38, 39, 115, 116, 210; fishing for, 115-122; brown, 18, 23, 24, 26, 116, 210; cutthroat, 29, 210; Dolly Varden, 29, 210, 211; lake, 26-29, 123-125, 211; fishing for, 123-125; Loch Leven, 29; rainbow, 18-26, 40, 116, 210; red-spotted, 29, 210, 211; salmon, 26-28; saibling, 29, 210, 211; sea, 37-40, 211; fishing for, 130-135; Sunapee or golden, 27, 29, 210, 211; steelhead, 29, 210, 211; Tahoe, 29, 210, 211; weight and length of, 188; raising, 11-14; shipping, 13, 14.
- Waterproofing boots, 191.
- Whitefish, 18, 30, 213.
- Worms, angle, 119, 120, 199.

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