

FOREST AND STREAM.

SUPPLEMENT NO. 3—SALMON AND TROUT.

SALMON AND TROUT OF NORTH AMERICA.

THE fishes of the salmon family, which are of especial interest to the angler, include the salmon and the trout, numbering in all twenty-six forms whose relationships are shown very briefly in the accompanying synopsis or key.

It should be stated that some of the trout are not recognized as full species by recent writers. The siscowet is usually regarded as a variety of the Great Lake trout. The Loch Leven is hard to distinguish from the brown, even by expert fishiculturists, and all ichthyologists will probably admit the difficulty of separating them.

Bouvier's trout, the Lake Tahoe trout, the Utah trout and the Kansas trout are referred to as varieties of the red-throated (*purpuratus*), perhaps without perfect justice.

The species of charr (*Salvelinus*) present as great difficulties as the black-spotted forms, and we can not say with confidence that even the New England species are fully understood. One object in bringing the present series of illustrations together is to show to anglers and other field naturalists the present state of our knowledge.

said by Prof. Cope to resemble the red-throated trout, *Salmo purpuratus*. The northern limit of *Salmo* in Alaska seems to be the Bristol Bay region.

The Atlantic salmon is found northward to Greenland. Its landlocked form, usually diminished in size and changed in coloration, occurs naturally in many lakes and streams of New England and Canada, as well as in the Scandinavian Peninsula. The most easterly native species of the black-spotted trout is that found in the Kansas River (*Salmo stomaia*). The eastward distribution seems to have been arrested by the low plains of the middle region of our continent, which are not favorable to salmon life.

The lake trout is one of the largest and most widely distributed of its family. It seems to be peculiar to North America, ranging across the whole width of the continent from the Arctic regions south to Idaho and New York. The siscowet is a smaller and fatter species with thicker skin and much larger spots than the typical lake trout. Its distribution is quite limited.

The charr, commonly called trout, number nine species, one of which has been introduced. These trout are perhaps more difficult to separate than any others of the

- DD. Introduced species; brown, with large spots of black or brown on body and sides of head; sometimes red spotted.
- F. Upper jaw bone strong and broad; teeth in middle of roof of mouth in a double series, persistent. *Brown Trout.*
- FF. Upper jaw bone narrow and feeble; teeth in middle of roof of mouth in a single series, persistent; dark spots on sides margined with pale blue in life.
- CC. Scales about 170.....*Rio Grande Trout.*
- BB. Teeth on root of tongue.
- G. Black spots generally distributed (absent in sea-run examples).
- H. Scales 170 or fewer; head short. *Red-throated Trout.*
- HH. Scales 184 or fewer; head long and conical. *Tahoe Trout.*
- GG. Black spots few or none on anterior half of body; scales about 200.
- I. Head long, keeled.....*Utah Trout.*
- II. Head shorter, not keeled.....*Kansas Trout.*

SALMON TROUT OR LAKE TROUT.

Bone in middle of roof of mouth with a raised crest, the crest as well as the head of the bone toothed; pyloric cæca very abundant.

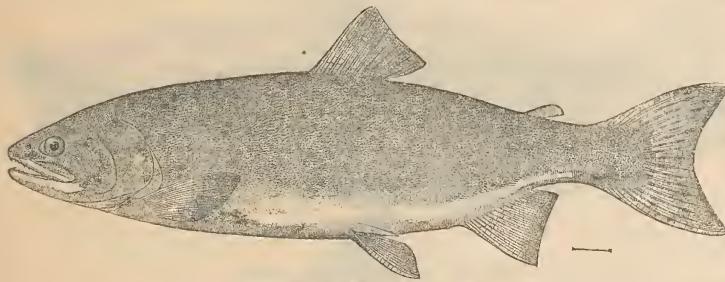


FIG. 1. HUMPBACK SALMON.

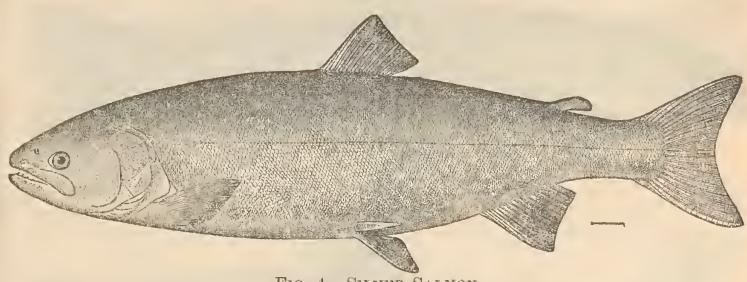


FIG. 4. SILVER SALMON.

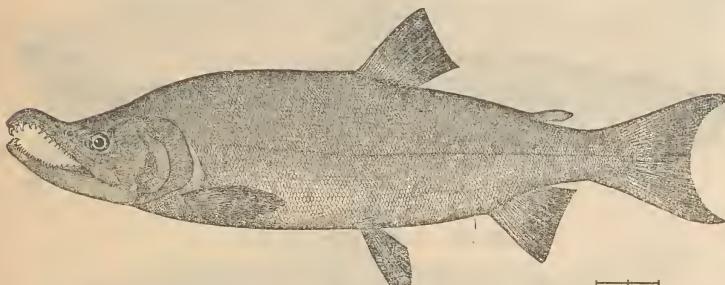


FIG. 2. BLUEBACK SALMON (HOOK-JAWED MALE).

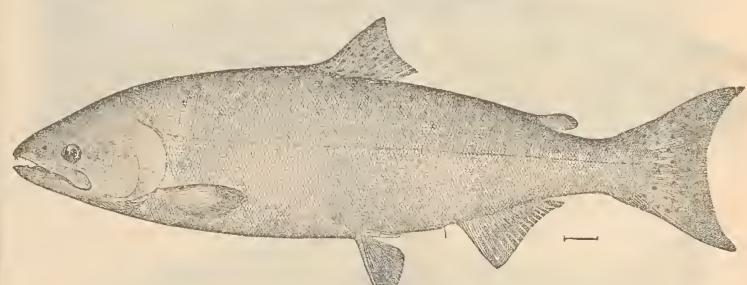


FIG. 5. QUINNAT SALMON.

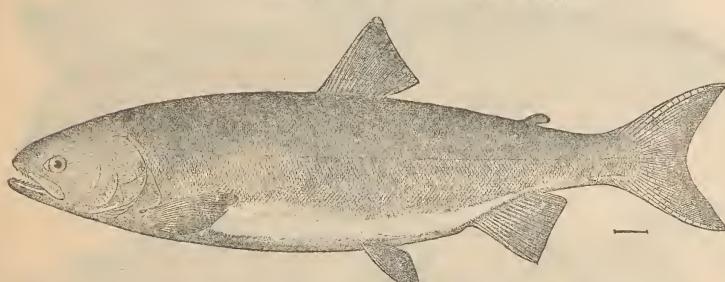


FIG. 3. DOG SALMON.

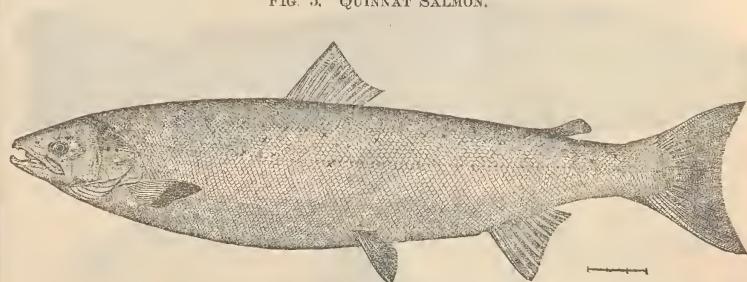


FIG. 6. ATLANTIC SALMON.

ledge, with the hope that they will endeavor to aid in every way possible to arrive at a better understanding of these interesting forms. Many of the illustrations here used are copied by permission of the U. S. Commissioner of Fish and Fisheries from advance sheets of the Bulletin of the U. S. Fish Commission. The Commissioner, Col. Marshall McDonald, is using every available means to help students in their efforts to master the problems presented by this important family of fishes. The three great difficulties to be overcome at present are (1) lack of material from certain localities; (2) great individual variation in many of the species, and (3) a lack of differentiation into forms which may be clearly distinguished by characters generally accepted as having specific value.

The Pacific salmon (*Oncorhynchus*) differ from *Salmo* chiefly in the greater number of rays in the anal fin; five species are known, all of which are black-spotted in fresh water, becoming silvery at sea. They run up the streams of our west coast from Alaska to California, and are found, also, in Asia. The humpback extends north to the Colville River and south to Oregon. Another species not yet identified is found in the vicinity of Point Barrow. The blueback ranges from the Yukon to the Columbia. The dog salmon from Putnam River, or Kuwuk, to California. The silver salmon has the same northern limit as the blueback, but extends south to San Francisco. The quinnat, king, or chouicha is found in the Yukon and south to the Ventura River, California.

The black-spotted species of *Salmo* are found further to the southward in North America than anywhere else in the world; one is known from streams of the Sierra Madre in the southern part of Chihuahua, Mexico, at an elevation of between 8,000 and 9,000 ft. This species is

Salmonidae; they extend from the Arctic regions, above 80° north latitude, to northern Georgia and California, in some portions thriving at elevations exceeding 5,000 ft. Four of the species are completely landlocked, the rest are to a greater or less extent anadromous whenever they have access to salt water.

KEY TO THE SPECIES.

PACIFIC SALMON.

- A. Scales small, more than 200.....*Humpback Salmon.*
- A. Scales medium or large.
- B. Gill rakers 30 to 40.....*Blueback Salmon.*
- BB. Gill rakers 20 to 25.
- C. Anal rays 13 or 14.
- D. Scales about 150, pyloric cæca 140 to 185.....*Dog Salmon.*
- DD. Scales about 127, pyloric cæca 45 to 80. *Silver Salmon.*
- CC. Anal rays 16.....*Quinnat Salmon.*

SALMON AND TROUT.

- A. Sea Salmon, anadromous (Subgenus *Salmo*).
Root of tongue toothless; teeth in middle of roof of mouth in a very small patch; scales larger, caudal forked except in the adult; gill rakers short, 19 in number.....*Atlantic Salmon.*
- AA. River Salmon (Subgenus *Fario*).
Teeth in middle of roof of mouth well developed, in one or two series; scales large or small; species all black-spotted in fresh waters.
- B. Root of tongue toothless.
- C. Scales fewer than 140.
- D. Native species; silvery, with small black spots; breeding males with a crimson band along the side.
- E. Anal rays 10; height of back fin equals $\frac{1}{2}$ length of head, which equals depth of body in young. *Gairdner's Trout.*
- EE. Anal rays 12; height of back fin equals $\frac{2}{3}$ length of head, which is much less than depth of body in young.....*Rainbow Trout.*

- A. Distance between the eyes about $\frac{1}{4}$ length of head; body covered with thin skin; profusely spotted with small pale spots.....*Lake Trout.*

- AA. Distance between the eyes about $\frac{1}{3}$ length of head; body covered with thick skin; sides with large pale spots.....*Siscowet.*

SPECIES OF CHARR.

- A. Root of tongue with teeth.
- B. Fins not banded.
- C. Lower bone of gill-cover nearly as deep as long and not conspicuously striated.
- D. Habitat western North America; migratory; gill rakers fewer than 20.....*Dolly Varden Trout.*
- DD. Habitat eastern North America; gill rakers more than 20.
- E. Migratory; size large; spawning in large streams and then going to sea.....*Sea Trout.*
- EE. Landlocked; size small or medium.
- F. Size very small; tail fin not tipped with white in young; back blue.....*Blueback Trout.*
- FF. Size medium or large; tail fin tipped with white in young.
- G. European species; teeth on root of tongue in a narrow band; stomach slender.....*Saithe.*
- GG. American species; teeth on root of tongue in a very broad band; clouded parr marks in young.....*Sunapee Trout.*
- CC. Lower bone of gill-cover twice as long as deep, with coarse striations.
- F. Size very large; species red spotted.....*Ross's Trout.*
- FF. Size very small; species without red spots.....*Flockberg Trout.*
- BB. Fins with dark bands.....*Dublin Pond Trout.*
- AA. Root of tongue toothless (usually); back mottled.
- H. Stomach very stout; gill rakers few.....*Brook Trout.*

- 1. HUMPBACK SALMON (*Oncorhynchus gorbuscha*). Fig. 1.—This is the smallest of the species, seldom exceeding

8lbs. in weight. It may be recognized at once by its minute scales. When it first comes in from sea its flesh is very palatable, but soon deteriorates as the spawning season advances. It is one of the most northerly species of its genus.

2. THE BLUEBACK SALMON (*Oncorhynchus nerka*). Fig. 2.—Other names of this fish are redfish and suckeye; the Russian name is *krasnyy ryba*, meaning redfish. This species is next in size to the humpback; its weight averaging less than 10lbs. Its flesh is very red, hence it is a great favorite for canning. It makes long journeys up the rivers, almost equaling the quinnat salmon as a traveler. On Frazer's River it is the chief salmon, and millions of its eggs are artificially hatched annually and the fry liberated in the streams. It ranges from the Columbia River to the Yukon.

3. THE DOG SALMON (*Oncorhynchus keta*). Fig. 3.—

occurs only in the large rivers. Commercially it is more important than any of the others, and it has received more attention from fishculturists than the rest of the species.

6. THE ATLANTIC SALMON (*Salmo salar*). Fig. 6.—This is also called Kennebec salmon and Maine salmon. It inhabits the north Atlantic, ascending rivers in northern Europe and America. The size that this species attains is too well known to need mention. A few years ago the British Museum obtained a specimen weighing 50lbs. The results of artificial propagation by which the species has been established as far south as the Delaware River are known to every one. The landlocked form, known as the Sebago salmon, landlocked salmon or winnifish, inhabits some streams and lakes of Maine and Canada. It has been introduced into many other lakes southward and westward. Eggs were carried recently to the vicinity of Quito, Ecuador. The variety thrives in

is about 6lbs. It is not anadromous to any great extent in its original habitat.

9. THE BROWN TROUT (*Salmo fario*). Fig. 9.—Brook trout of Europe. Native in the rivers of the Maritime Alps, also in rivers and lakes of northern and central Europe. Non-migratory. Extensively introduced in the United States, where it is thriving and constantly gaining favor. It is said to reach 17lbs. in weight, and its game qualities are greatly praised.

10. THE LOCH LEVEN TROUT (*Salmo levenensis*). Fig. 10.—This trout inhabits Loch Leven and other lakes of southern Scotland and the north of England. It is non-migratory. Dr. Day considers it to be a variety of the brown trout. The species is an excellent one, growing to a weight of 10lbs., and affording fine sport to anglers; it has been introduced into New York, New Hampshire and other New England States, Iowa, Minnesota, Michi-

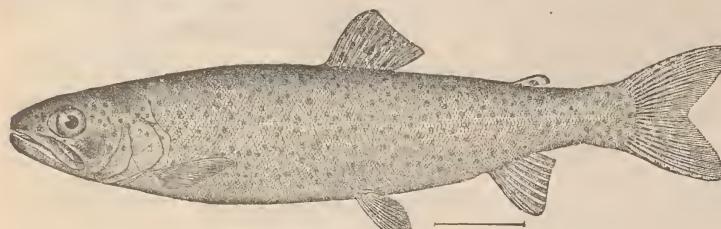


FIG. 7. GAIRDNER'S TROUT—YOUNG.

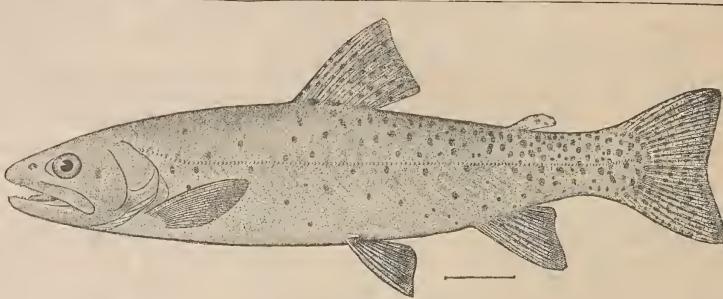


FIG. 11. RIO GRANDE TROUT.

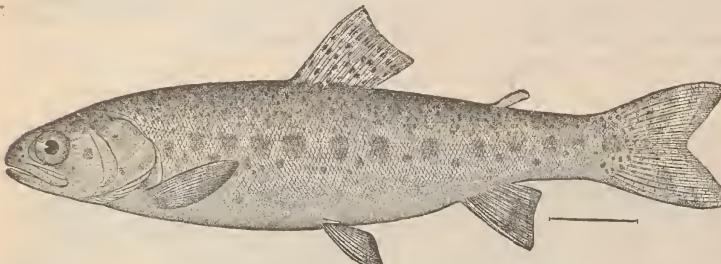


FIG. 8A. RAINBOW TROUT—YOUNG.

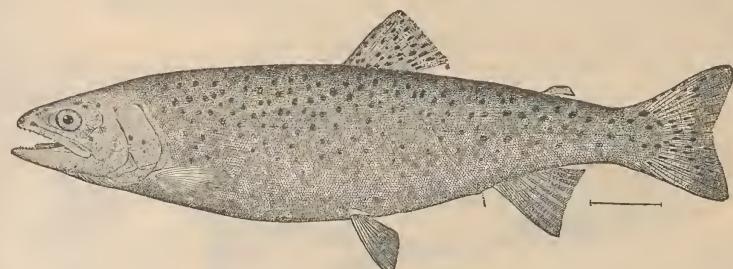


FIG. 12. RED-THROATED TROUT.

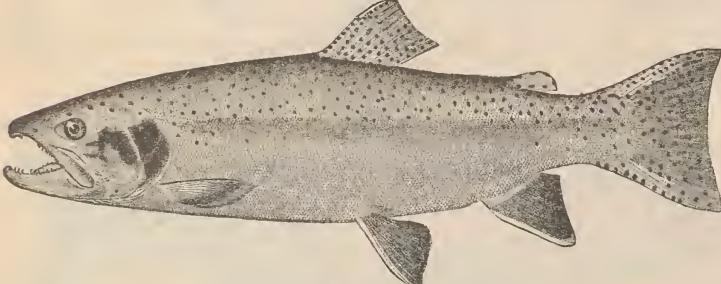


FIG. 8B. RAINBOW TROUT—ADULT.

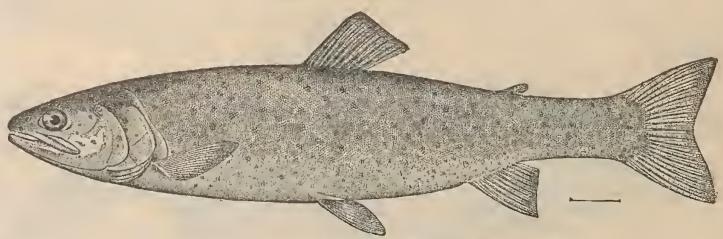


FIG. 13. LAKE TAHOE TROUT.

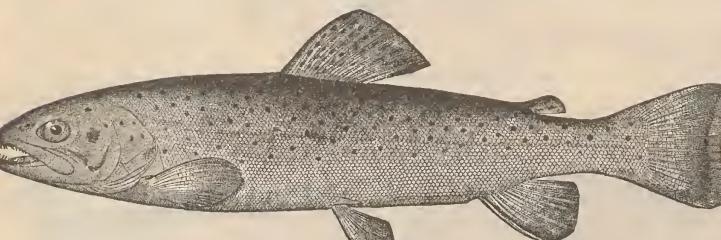


FIG. 9. BROWN TROUT.

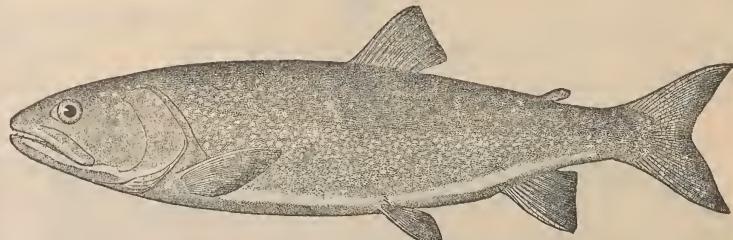


FIG. 15. LAKE TROUT.

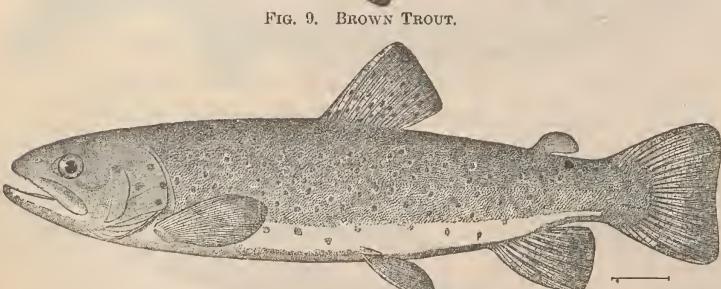


FIG. 10. LOCH LEVEN TROUT.

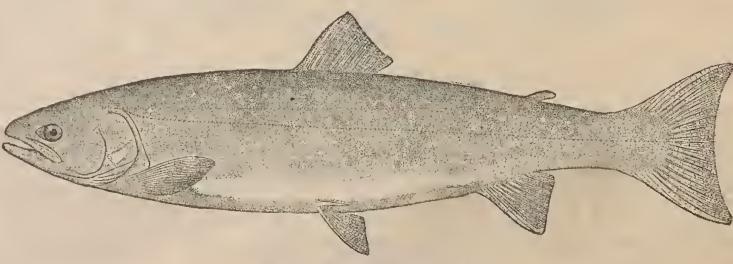


FIG. 16. DOLLY VARDEN TROUT.

Known also as hycho and Le Kai salmon. The average weight of this species is about 12lbs., becoming somewhat larger in Alaska. It is found as far north as Kotzebue Sound. It has very little economic value, except in the dried condition, and is used principally for dog food.

4. THE SILVER SALMON (*Oncorhynchus kisutch*). Fig. 4.—Its common names are kisutch, coho salmon, hoopid salmon, skowitz, *bielaya ryba* (Russian). This is one of the choice salmon of the west; it ranges from San Francisco northward to the Yukon. It is a small species running up the streams in the fall; its average weight is under 10lbs., larger specimens occurring in the northern portion of its habitat.

5. THE QUINNAT SALMON (*Oncorhynchus chouicha*). Fig. 5.—Other names are king salmon; chinook, Columbia River salmon, Tyee salmon, Sawkwey and chouicha. This is the largest and most valuable species. Specimens measuring 5ft. in length and weighing nearly 90lbs. have been taken in Cook's Inlet and the Yukon River. It makes long journeys, penetrating into the interior more than 1,000 miles to reach the headwaters of streams; it

Colorado, at an elevation of 8,000ft. and upward. This form is generally smaller than the anadromous one, and differs slightly in coloration.

7. GAIRDNER'S TROUT (*Salmo gairdneri*). Fig. 7.—Known also as steelhead, hardhead, salmon trout, *ahshut* (Sitka). This species ranges from California to southern Alaska, where it spawns in spring. It spends much of the time at sea. In its adult state it resembles the Atlantic salmon in shape and general appearance. In the breeding season it has broad crimson bands along the sides. Specimens weighing 30lbs. have been taken. It grows to a much larger size than the rainbow, with which it has sometimes been confused.

8. THE RAINBOW TROUT (*Salmo irideus*). Fig. 8.—The rainbow is sometimes called California brook trout. It is a native of streams west of the Sierra Nevada Mountains and ranges southward nearly to the Mexican line. Its northern limit is uncertain, but it probably extends to Sitka, Alaska. This fish has been extensively introduced into the Eastern States, and is now well established in Europe. The maximum weight reached by the rainbow

gan, Wisconsin and elsewhere in the West. The black spots of the sides are encircled with a narrow pale blue border in life.

11. THE RIO GRANDE TROUT (*Salmo spilurus*). Fig. 11.—Mountain streams of the upper Rio Grande and Basin of Utah. A handsome trout, reaching 18in. in length. The scales anteriorly much smaller than on second half of body. Teeth in middle of roof of mouth in a double series. Black spots few on first half of body, numerous on second half and on dorsal, caudal and anal fins. A large and fleshy adipose dorsal. This is one of the best food and game fishes in the region which it inhabits.

12. THE RED-THROATED TROUT (*Salmo purpuratus*). Fig. 12.—Clark's trout; salmon trout. This fine game species is common in the Rocky Mountain region and the Cascades; its limit in Alaska is the peninsula of Aliaska. The red-throated trout reaches a length of 30in. and sometimes exceeds 20lbs. in weight. The species is variable; the Lake Tahoe trout, Utah trout and Kansas trout have been considered as mere color variations with smaller scales than the typical *purpuratus*. Bouvier's

trout is published as a variety of the red-throated, but it is certainly entitled to as much consideration as the Utah trout, which has some marked characters. The red-throated trout is profusely black spotted and has a characteristic dash of crimson around the throat.

13. LAKE TAHOE TROUT (*Salmo henshawi*). Fig. 13.—This is known also as the silver trout and black trout. It is found in Tahoe and Pyramid lakes, Nevada, and in streams of the Sierra Nevada. The average size of the species is 5 or 6 lbs., but individuals weighing 25 lbs. have been taken. The species is common in the San Francisco markets.

14. THE UTAH TROUT (*Salmo pleuriticus*).—This will be found put down as a variety of the Rio Grande trout, *Salmo spirurus*, but the typical specimens have teeth on the root of the tongue, bringing the species into the group represented by the red-throated trout. It inhabits the

Fig. 16.—Known also as bull trout, salmon trout, malma and goletz. The species occurs in California and northward to the Colville River in Alaska; eastward to tributaries of the Saskatchewan. It increases in size northward, reaching a length of 2 ft. and a weight of 6 to 8 lbs. At Kodiak it is extensively caught in the sea-run condition and salted under the name of salmon trout. The Alaska natives make waterproof clothing of its skin. In general appearance this trout resembles the sea trout of Labrador; in fresh waters it is beautifully red spotted, but has not much reputation as a game fish.

18. THE SEA TROUT (*Salvelinus stugnus*). Fig. 17.—This fine charr is called Greenland trout, salmon trout or sea trout. Little is known of its habits except that Turner says it runs up the larger streams in Labrador to spawn. Most of its life is passed at sea, and the fishery is carried on in salt water. The sea trout reaches fully 2 ft. in length. We have never seen a specimen

Feb. 7. The saibling reaches a length of more than 2 ft. In habits and general appearance it resembles the Sunapee trout.

21. THE SUNAPEE TROUT (*Salvelinus aureolus*). Figs. 20 and 21.—This handsome species has not yet been recorded from any other body of water than Sunapee Lake, New Hampshire. The appearance of the species has been so often described in FOREST AND STREAM that it need not be repeated at present. The weight of the Sunapee reaches 10 lbs., according to Col. E. B. Hodge, who was the first to bring it to the notice of ichthyologists. The species was well established in Sunapee Lake before the introduction of the saibling, which it strongly resembles in coloration when adult.

22. ROSS'S TROUT (*Salvelinus rossi*). Fig. 22.—This is a little known species and may not be distinct from the sea trout previously mentioned, but is introduced here

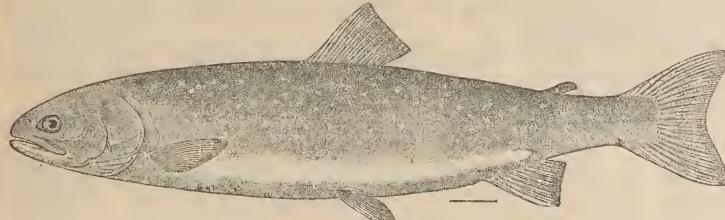


FIG. 17. SEA TROUT.

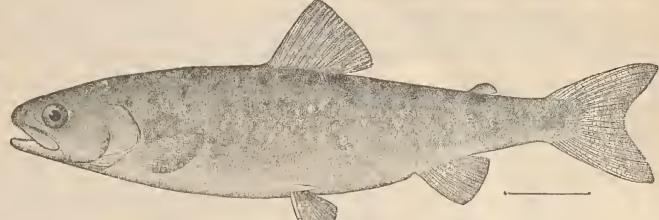


FIG. 21. SUNAPEE TROUT—YOUNG.

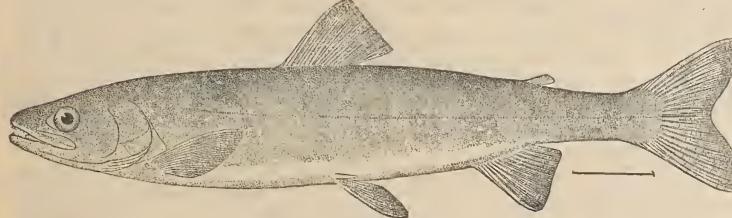


FIG. 18A. BLUEBACK TROUT.

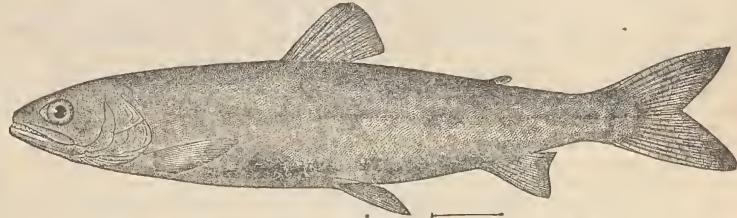


FIG. 22. ROSS'S TROUT.

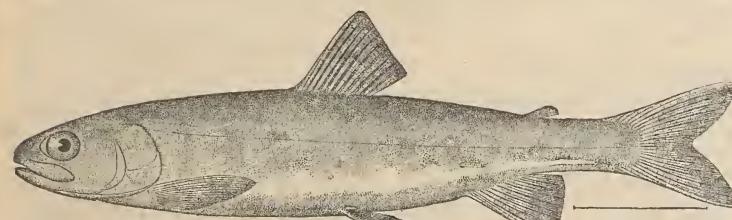


FIG. 18B. NARES'S TROUT.

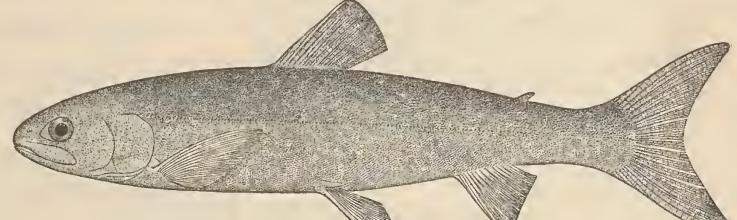


FIG. 23. FLOEBERG TROUT.

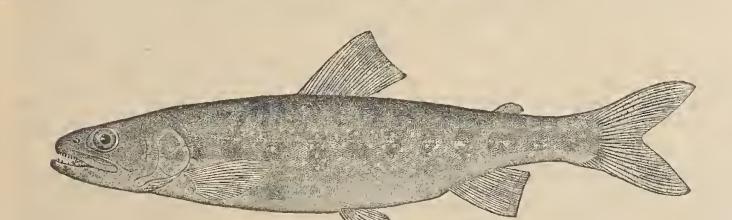


FIG. 19. SAIBLING.

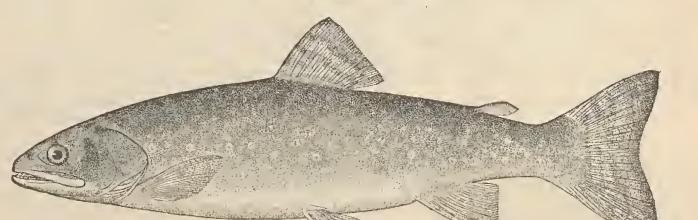


FIG. 24. DUBLIN POND TROUT.

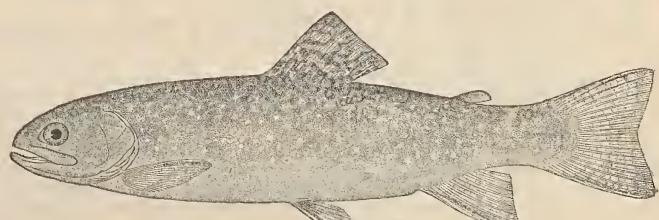


FIG. 25. BROOK TROUT.

Basin of Utah and upper tributaries of the Rio Grande, reaching a length of nearly two feet and a weight of 5 lbs. The Utah trout is one of the best of our game fishes.

15. KANSAS TROUT (*Salmo stomias*).—The most easterly of the black-spotted species, resembling the Rio Grande trout in coloration, but with much smaller scales and a very large mouth. The scales are as small as in the lake trout. The black spots are most numerous on the second half of the length. This trout grows to a length of 24 in.; it was obtained in Kansas River, far to the eastward of the Rocky Mountains.

16. THE LAKE TROUT (*Salvelinus namaycush*). Fig. 15.—Mackinaw trout, longe, tote, tuladi, namaycush, lake salmon, salmon trout and peet are other names applied to this species. In general terms we may say that the lake trout inhabits North America from the Arctic regions southward to New York and Idaho, reaching its greatest size in large, deep lakes containing plenty of fish food. The color variations of this trout are remarkable, but in the main it is characterized by small pale spots on a gray to black ground. The largest well authenticated specimen was taken in a gill-net at Racine, Wisconsin, and weighed 60 lbs., according to Dr. Hoy. The wiscowet may have to be considered as a separate species on account of differences briefly mentioned in the key, but we need fresh specimens to determine this.

17. THE DOLLY VARDEN TROUT (*Salvelinus malma*),

from fresh water, but pale spots are plentiful on the sides of sea-run examples, and these would be red in spawning individuals. The species is long, slender and elegant in proportions.

19. BLUEBACK TROUT (*Salvelinus oquassa*). Fig. 18A.—This is known also as oquassa trout. The blueback is certainly known from lakes and streams of western Maine; its range to the northward would be extended to Arctic America if we include Nares's trout under this name; but the justice of this course is open to question, and we ought to devote a little more study to the subject before uniting the two. This is a small trout, weighing only a few ounces, as far as we know from existing specimens in collections. Anglers will doubtless help us to a more complete knowledge of the size and distribution of the species. Individuals of 9 in. long are sexually mature. A figure of Nares's trout (Fig. 18B) is introduced for comparison with the blueback.

20. THE SAIBLING (*Salvelinus alpinus*). Fig. 19.—Called omble chevalier in France, torgoch in Wales, Alpine charr, Windermere charr, Loch Killin charr, Gray's charr and Cole's charr in Great Britain. The species is a native of Alpine lakes in Bavaria and Austria and the Scandinavian peninsula; it has been extensively introduced into the United States. A specimen taken in Sterling Lake, New York, is described in FOREST AND STREAM of Jan. 24, 1889, and figured in the issue of

to call attention to a curious form obtained in Quebec, 70 miles east and 40 miles north of Montreal, early in February, 1886, by Mr. C. H. Simpson, a member of the St. Bernard Alpine Club. Ross's trout is noted for the shape and striation of its gill-covers, particularly the lower bone; it grows to weigh 14 lbs. and is most common near the sea in river mouths of Boothia Felix. We have been advised to describe this Quebec trout as a new species, but prefer to await additional specimens before reaching a conclusion.

23. THE FLOEBERG TROUT (*Salvelinus arcturus*). Figs. 23.—This is one of the small species, not exceeding a foot in length. It is the most northern salmonid known, occurring in Victoria Lake (62° 34') and fresh water pools about Floeberg Beach (62° 28', north latitude). Seasonal development begins in August. The species is said to be without red spots. The illustration is copied from the original figure in Proceedings Zoological Society of London, 1877.

24. THE DUBLIN POND TROUT (*Salvelinus agassizii*). Fig. 24.—This handsome little trout inhabits Dublin Pond, or Monadnock Lake, and other small lakes of New Hampshire. It reaches a foot in length. It is said to spawn two weeks earlier than the brook trout, using the same spawning grounds. The dorsal and caudal fins are banded, but the back is uniformly olive brown or gray and never mottled like the brook trout. The stomach is

very stout. There are teeth on the root of the tongue. Adult specimens become very much bleached in color and uniform silvery. The red spots are large and less numerous than in brook trout of the same size.

25. THE BROOK TROUT (*Salvelinus fontinalis*). Fig. 25.—Generally called speckled trout or speckled beauty. This well-known species ranges naturally from Labrador to Georgia east of the Alleghenies, also in the Great Lake region. It has been widely distributed westward and across seas. It is recorded on good authority that specimens weighing 10lbs. occur in the Rangeley Lakes and Dr. Hoy has seen one of 12lbs., but such examples seem to be rare. The species has quite a reputation for sea going, as will appear from articles recently received by FOREST AND STREAM, as well as from advices from England. The color variations in the brook trout are astonishing.

TARLETON H. BEAN.

TROUT OF THE NORTHWEST.

FROM conversations with Capt. Charles Bendire, U. S. A., we have obtained the following information about the trout of Oregon, Washington Territory and Idaho:

There is no better fishing anywhere in the West than in Williamson's River, Oregon. Gairdner's trout abounds in this stream and its tributary, the Sprague. The Wood River, which flows into Klamath Lake, is an especial favorite for spawning in the winter. Indians spear the trout on their spawning grounds. At the season when crickets are plentiful they must be used for bait in the Sprague; flies will be refused. In Williamson's River, from July to September, Gairdner's trout affords the best fly-fishing I have ever enjoyed. My first sergeant often went out on Sundays, during the summer, and caught as many as 100lbs. of trout, ranging from 2lbs. to 7 or 8. The favorite fly was the white and red-ibis. These flies were made in San Francisco especially for that fishing. Gairdner's trout reaches 21lbs. in weight in this region; I have obtained one weighing 14½lbs.

Clark's, or the red-throated trout, is very plentiful and affords the best fishing in some of the tributaries of the Snake River, especially Canas Creek in Idaho. Here they average 2 or 3lbs. in weight. Cœur d'Alene Lake, Idaho, and Spokane River, Washington Territory, are good localities for this species. The Indians depend mostly on spearing and traps for their supplies. Bouvier's trout, which is a little color variety of the red-throated, is found only in Waha Lake on the top of the Blue Mountains, or Craig's Mountain, near Lewiston, Idaho. This is a very deep mountain lake, and apparently contains no other fish. The trout are nearly uniform in size and none of them exceed 12in. in length. A species called "salmon trout" runs up from Snake River into Lapwai Creek, Idaho, in March and April to spawn. They are taken in traps and are speared in large numbers, but they will not take a fly or bait—not even their own eggs. These fish vary from 5 to 10lbs., and are full of eggs when they come into the creek. From some of them the eggs will run out when the trout are held up; others are not quite so ripe.

"Bull trout" is a common name applied to the Dolly Varden throughout the Northwest. The fish is not equal to Gairdner's or to the red-throated trout either for eating or sport. It seldom takes the fly in that part of the country, being a ground feeder and softer in flesh than the other two species. The bull trout rarely reaches 7lbs. in weight. It is much more voracious than either of the others, killing every fish near it when closely confined, as in aquaria.

MINGAN RIVER TROUT.

WHILE we were at Mingan, southern Labrador, with the Grampus in the summer of 1887, trout were reported to be abundant at the falls of the Little Manitou River, about 3 or 4 miles from a point on the Mingan River opposite where the vessel lay and across a comparatively narrow neck of land from the harbor. There had, however, been a freshet, and the muddy condition of the water as well as the height of the river above its usual level made fishing impracticable for several days. Finally we were assured that the water had subsided sufficiently to make it possible to catch some trout, and the local Canadian official courteously tendered us the use of his canoe, a kindness for which we were largely indebted to the good offices of the gentlemanly commander of the cruiser La Canadienne.

Mr. Lucas was charged with the responsible duty of providing the outfit of fishing gear, which was soon ready, and, after "a long pull, a strong pull, and a pull all together," he and I reached the foot of the falls. There we met the Indian, Jean Batiste, who had been out with us seal hunting a few days before, and his squaw, and the keen-eyed aborigine told us, "trout, him plenty; him no want to bite."

On our way up we had also passed and hailed a disappointed angler, who was returning to the harbor, and whose story of failure was of the same tenor as that conveyed by the Indian. That trout were as plentiful as heart could desire was evident—and beauties too! They could be seen below the falls jumping out of the water, while every few minutes a nimble gymnast, his spotted sides glistening in the sun against the dark background of ledge or rushing water, sprang high in the air in this effort to leap the fall. Near the fall was a deep pool, about 50 to 75 feet across, that had been filled up by the late rise in the river, but was now separated from the latter by a narrow strip of beach, which was covered with scattering alders. This pool was literally alive with trout that could be seen jumping and breaking water in a manner to make the nerves of an angler tingle to his finger tips. My friend could not accept as final the reports he had received and he would have been far less an enthusiast if he had allowed the assertion, "they won't bite at anything," to deter him from trying his luck. Around and over the pool went the flies of all colors and varying sizes, bait cut with the greatest skill; but no results, while the leaps and the flapping tails still tantalized us. It was trying to the nerves, and no mistake! I became tired and disgusted with our lack of success, and, sitting down by the falls, tried to console myself by watching the magnificent display of power exhibited by the trout leaping up the rush of falling water.

My companion was more patient and persistent. He fairly ached to catch some of those trout. Failing in the

pool, he whipped the river above the fall for some distance, and finally came back to his starting point. Luckily at this time he remembered a spoon bait that he had brought along, and, although we had repeatedly been told by the local anglers that "spoons are no good here," he determined to learn for himself the truth or fallacy of the assertion. However indifferent the trout may have been to a spoon at other times, it was soon evident that the glistening silver had great attraction for them on this occasion. No sooner had the cast been made than the hook was struck by a handsome fish, and a few moments later I was aroused from watching the tumbling waterfall and leaping fish by a triumphant shout behind me. Turning I saw a sight that sent the blood coursing through my veins with accelerated speed, for there among the alders stood Mr. Lucas, the embodiment of that special happiness known to the successful angler alone. His face was beaming with triumph as he held up his capture—a trout that weighed 3½lbs., of which a cast was made after we returned to the vessel.

What possibilities of "fish stories" before the scientific societies and clubs of Washington crowded the brain of my friend I cannot say; but it was plain that he felt that the opportunity he had been looking for had come at last. Like a prudent general, however, he calculated the chances, and the first thing he did was to tie on a new gut leader, so that no unnecessary risk might be taken with the single spoon, which was our only dependence for an afternoon's sport. Two or three medium sized trout, weighing between 1 and 2lbs. each, were soon landed, and the fish seemed so eager for the spoon that we were beginning to settle down to business. I believe I made some mental estimates as to how many it would take to fill a barrel; but, alas for our happiness and the prospective stories! just then the spoon was seized by a big fellow with a vine, making the line hum and sing for a moment, and then—off he went with our priceless spoon. Never shall I forget the expression that spread over my companion's face; it is impossible for me adequately to describe it. It was a fit accompaniment to the emphatic exclamation which greeted my ears and in which surprise, disappointment and disgust were about equally blended. This were our ambitions and expectations crushed in a moment, for only a single trout rewarded hours of effort after the spoon was lost, and although he was a noble fellow and fought with remarkable skill and endurance, we could not forget our loss and disappointment in the sport he furnished us, especially as we knew we should sail next day from Mingan, and no other chance would be afforded us to visit the falls.

J. W. COLLINS.

TROUT FISHING IN UTAH.

IN the month of June, several years ago, in company with two friends, I went trout fishing in Lost Creek, Wahsatch Mountain, sixteen or eighteen miles below Park City, Utah. Nobody had fished there that spring and trout were abundant. I was using a large fly with big wings, exactly like the pheasant, but gray, and the mountain trout would not take it at all; they seemed to be striking at something resembling a wasp. I trimmed off the feathers with a knife, to imitate the wasp wings, and then caught with that fly twenty-three trout ranging from 4lb. to 1½lbs. The smaller ones were taken in the ripples at the rapids, and the larger ones in pools between the rapids. I had tried two or three other flies, but the trout would not take them. At one of the riffles I failed to get a strike, when I saw on the opposite side a place about two feet wide and two feet deep, where a stone had fallen out from the edge of the bank. I tossed the fly into this hole and three trout jumped at it, clean out of water. I caught five, averaging ½lb. each, out of that little hole when it was impossible to get a rise in any other part of that riffle. These were the fiercest trout I ever saw; there was no such thing as scaring them; if they missed the fly the first jump, they would try it again and again until hooked, sometimes throwing themselves entirely out of water; we took between sixty and seventy in all.

WILLARD NYE, JR.

SELDOM COME BY TROUT.

CAREFUL catechising of the inhabitants of Seldom Come By, who visited the Fish Commission schooner Grampus, on which I was enabled to go to Labrador in the summer of 1887, elicited the fact that there were two ponds "about a mile off," said to contain trout and gulls. Accordingly a scouting party was organized on the morning of July 25, to make an armed reconnaissance in that direction, and soon after breakfast we moved landward. Landing at the upper end of the harbor, the first attack was made on a little trout brook and resulted in the capture of one good trout and three "tinkers." March was then resumed toward the pond—and what a march it proved to be! If, as we were told, there was a "sort of blind path," we were too blind to find it, and stumbled along over stones, through bogs and bushes, and among the burned and fallen spruces that covered the ground with a complete network. Often too weak to bear a man's weight, they were strong enough to trip him up, tear his clothes and ruffle his temper. Half an hour's continual struggle, tormented by flies and bitten by mosquitoes, failed to bring the ponds within range of vision. Capt. Collins led the way with a gun, closely followed by Frank with an oar, from which lung net, rope and boots—paraphernalia to be used in the capture of supposititious small fry. Hot and thirsty, I brought up the rear with an axe, two fishing rods and a bag full of provisions, convinced that if labor met its just reward we deserved at least a barrelful of trout. Still struggling onward, almost discouraged, we forced our way through a perfect abatis of fallen timber, and lo, there was the pond! And a most unpromising looking pond it was, too—apparently a mere flooded bog hole fringed with bushes and here and there walled by the ever present rock. Adopting my usual tactics in such cases, "accoutered as I was I plunged in," throwing out here and there without any hope of success. Ten or fifteen minutes was sufficient to justify my doubts, and wet and bruised I returned to the spot where we first struck the pond. Just then Frank, who had gone in the opposite direction, shouted that he had found some trout, so with a somewhat incredulous spirit I started after him, slipping over rocks, sinking into mud, and stumbling over concealed sticks. The spot where Frank directed me to throw was not a promising one, being a shallow little cove studded with rocks, between two of which my cast was

made. A tightening of the line, a tug, a turn of the wrist, and out came a lively, handsome trout. My spirits rose, and a successful throw brought them up to summer heat. Flies and mosquitoes ceased to be unbearable, as one after another a dozen fine trout were safely landed. Now the biting slackened, but diffidently changing bait for a fly showed that trout were still hungry. When the sun came out a smaller fly proved attractive until it was literally worn out. At last, after two hours, a bright sun and dead calm put an end to our sport and we retired with a good basket of the speckled beauties. When counted we found we had caught 50 fish, whose weight was 12lbs., the four largest averaging a half pound each. My own catch (I was selfish enough to do most of the fishing) was 36, weight 9lbs. Another struggle through the woods brought us to our boat and ended my most successful troutling expedition.

F. A. LUCAS.

SALMON FAMILY IN THE FAR NORTH.

WHEN we reach the extreme northwestern corner of our continent, at Point Barrow, where the writer spent the two years from September, 1881, to August, 1883, we leave behind the myriads of salmon and trout, which we have come to associate with the name of Alaska.

Only a few humpbacked salmon (*Oncorhynchus gorbuscha*) with one or two salmon of a species not yet determined, and a very few individuals of the Pacific red-spotted trout (*Salvelinus malma*), of large size and bright silvery color from long residence in the sea, are caught in the shallow bays in the immediate neighborhood of Point Barrow during the short summer. These are all caught in gill-nets skillfully made of fine strips of whalebone, or of fine strong twine made by braiding shreds of reindeer sinew. The nets are set with stakes at right angles to the shore, in the shoal water of the larger bay at Point Barrow, close to the great summer camp and fair ground. Here the Esquimaux from the two Point Barrow villages assemble to meet the Esquimaux from Kotzebue Sound, who have traveled up to the headwaters of the Colville during the winter, and have come down the river with the spring floods and traveled westward in the open water along the coast. Whitefish, too, chiefly *Coregonus lauriette*, are also caught in the nets, but the fishing is really a very trifling affair.

The natives, however, who go east to the Colville every summer to meet the people from Kotzebue Sound and the Mackenzie, find fish more plenty. One of my Esquimaux acquaintances, who went to the mouth of the Colville in the summer of 1882, found the trout so abundant that he fed his dogs with them.

They told us, too, of the grayling, the "wing-fin," as they call it, in the Meade River or Kulngrua, a stream which flows into the Arctic Ocean about fifty miles east of Point Barrow. This fish, they said, was never caught in nets, but "ate a hook." We brought home several of these hooks, made after the pattern so common in Alaska, a sort of little "squid," made of a club-shaped piece of walrus ivory, colored by charring the surface with fire, and armed with a barbless hook.

With such a hook as this they probably angle for the grayling, and perhaps also for the trout, using a short, rough rod about a yard long, with a whalebone line, longer than the rod. We never saw these used, for there is no angling near our station, except for the little polar cod, which are caught through the ice in winter.

The three species of whitefish, however, *Coregonus richardsoni*, and *C. nelsoni*, which are large species, and *C. laurette*, which is a small one, are the members of the salmon family most important to the Point Barrow Esquimaux. These are caught in the Meade River and its tributary, Kuaru, chiefly in winter after the rivers are frozen over. For the Meade River they say freezes down to the bottom on the shallow bars, so that the fish are penned up in the deep holes and cannot escape to the sea, as they do in the rivers further east. Many of the natives go to these rivers to hunt reindeer in October and early November, and again in February and March. Here they stay in camp, and while the men are hunting the women set their nets through holes in the ice and catch a great many fine whitefish. Many a load of these is brought in frozen hard by the returning deer hunters.

On the whole there is very little about Point Barrow to recommend it to the angler. Many a time did I regret the enforced idleness of my Scribner greenheart rod, which I never had a chance to put together during the whole two years.

I believe, though, that the enterprising angler, who will one day cast his flies over the virgin waters of Kulngrua, will have wonderful sport with the grayling and trout. If the Esquimaux can catch them with his primitive tackle, what couldn't a man do with civilized gear.

SMITHSONIAN INSTITUTION, March 21. JOHN MURDOCH.

A TWELVE-POUND BROOK TROUT.

THE venerable and genial Dr. P. R. Hoy, of Racine, Wis., is one of the best illustrations of the beneficial effects of natural history studies and out-of-door sports in prolonging life and preserving strength. He recounted to us recently his participation in the capture of the celebrated 12-pound brook trout by Seth Green in the Sault Ste. Marie, in 1875. Readers of FOREST AND STREAM will remember the description in this journal at the time. The Doctor states positively that the fish was a brook trout and that he saw it weighed on a pair of "balances;" the weight was "down weight." When the landing net was used, it was a question at first whether the Doctor should go into or the trout come out of the water. Dr. Hoy made the first studies of the food of the whitefish, and secured many new animals in his early deep-water explorations in Lake Michigan.

BROOK TROUT AT SEA.

ABOUT the middle of the winter of 1886-87, I caught a brook trout in a fyke net at the head of Great Harbor, Woods Holl, in company with tonoced and flatfish. This was the second one obtained by me in salt water. When the alewives, or river herring, strike in about July 1, the trout leave the streams in this vicinity, and are seen no more until the first open spell in February. They come in with the smelt. When they arrive they are of mixed sizes, 2in., 4 or 5in., and adults of about 12in. Their spawning begins here about March 1.

V. N. EDWARDS.

WOODS HOLL, Mass.