

YELLOWSTONE PARK FISHES.

The Fish Commission has recently published in its "Bulletin" some interesting and valuable reports of explorations of waters in various regions of our country. Among these the reconnaissance of the streams and lakes of the Yellowstone National Park by Dr. David Starr Jordan, on account of the popular sympathy with the efforts of the Government to protect and improve this great "pleasuring ground" and the effective manner in which the explorer has handled his mission of inquiry, is attracting well-merited praise. This paper is rendered all the more acceptable by the many fine illustrations which enrich and explain the text.

Dr. Jordan's exploration was made in the fall of 1889 at the request of Commissioner McDonald. Dr. Charles H. Gilbert and Mr. W. W. Spangler assisted in the investigation, and the most hearty and intelligent coöperation of Capt. F. A. Boutelle, Lieut. W. E. Craighill and Lieut. Edwards, as well as the services as guide of Mr. Elwood Hofer, contributed greatly to the successful prosecution of the work. Numerous streams of the Yellowstone, Madison and Snake River basins were examined and trout were found in the following: Yellowstone River, Yellowstone Lake, Riddle Lake, Solution Creek, Trout Creek, Alum Creek, Antelope Creek, Black-tail Deer Creek, Lava Creek, Lupine Creek, Gardiner River, Madison River, Gibbon River, Cañon Creek, Horse Thief Spring, Heart Lake and Witch Creek. In Riddle Lake trout live at an altitude of 7,900ft.

According to Dr. Jordan the Yellowstone Park is a plateau with an elevation of 7,000 to 8,000ft. above the sea, and for the most part covered with lava of Pliocene age. The lava flow was fatal to fish life. Since its surface has become cold the waters flowing over it have been inhabited by plants, insects and crustaceans suitable for fish food, but not with fishes, since the streams leave the lava beds over falls having a height of 50 to 308ft. "The water of the geysers and other calcareous and silicious springs does not appear to be objectionable to fishes. In Yellowstone Lake trout are especially abundant about the hot overflow from the Lake Geyser Basin. The hot water flows for a time on the surface, and trout may be taken immediately under these currents. Trout have also been known to rise to a fly through a scalding hot surface current. They linger in the neighborhood of hot springs in the bottom of the lake. This is probably owing to the abundance of food in these warm waters, but the fact is evident that geyser water does not kill trout. The Hot River, which drains the Mammoth Hot Springs, flows into Gardiner River. Trout abound about the mouth of this stream, and here, as in numerous other places in the Park, the conventional trick of catching a trout in cold and scalding it in hot water is possible." The number of fishes found in the Park was very small, including only ten kinds, of which two are suckers, four minnows and chubs, a grayling, a whitefish, a red-throated trout, and the inevitable scourge of all trout waters, the blob or freshwater sculpin. The fish fauna was augmented in August and September, 1889, by the following plants by the Fish Commission: Five thousand trout (*fontinalis*) in Glen Creek and in Gardiner River above the falls; 1,000 rainbow trout (*irideus*) in Gibbon River; 1,000 Loch Leven trout in Firehole River, above Keppeler's Cascades, and 1,000 Williamson's whitefish in Twin Lakes, and the same number in Yellowstone River below the lake. One of the species of sucker was found to be infested with a flat intestinal worm, sometimes reaching a foot in length, but apparently not affecting the health of the fish. The large chub of Heart Lake and Witch Creek (*Leuciscus atrarius*) was full of eggs at the end of September, unusually late in the year. About the whitefish Dr. Jordan reports as follows: "The mountain whitefish is abundant in the Madison River below the falls. It is said to be equally common in the Yellowstone, but none were obtained by us. It is a slender and graceful fish, readily taking the fly like a grayling or trout. It is most abundant, so far as we have noticed, in the eddies or deeper places in swift streams. It seems to be essentially a river fish, rather than an inhabitant of lakes." "The grayling is very abundant in the Madison River below the junction of the Firehole and the Gibbon. Numerous specimens were collected for us in Horse Thief Spring, a small stream just outside the limits of the Park, by Mr. Lucas. The grayling is said to ascend the river in summer as far as the Firehole Falls and Gibbon Falls. It is said also to

be found in the Gallatin River, in the northwestern part of the Park."

Dr. Jordan refers all the trout of the Park to a single species, represented by numerous color varieties, but all black spotted and having a characteristic red dash across

near the bridge below the mouth of the Hot River. Dr. Jordan considers it identical with, or a slight variety of, the gray sucker of the Platte Valley. It is closely similar to the common long-nosed sucker of the Eastern States, and is believed to reach a length of 18in. The color is "dark gray, irregularly mottled and barred with black."

2. THE RED HORSE SUCKER (*Catostomus ardens*).—This is a large-scaled species, represented by examples measuring from 6 to 16in., occurring in Witch Creek and Heart Lake. It was considered to be identical with the common sucker of Utah. "This fact, together with the general affinity of the fishes of Heart Lake with those of the Great Basin, suggests that the fauna of the Upper Snake River, above the great Shoshone Falls, may have been derived from the Great Basin rather than from the Lower Columbia." Tape worms flourish in this fish, sometimes occupying more space than all the abdominal viscera, yet the parasitized suckers appear to suffer no loss of flesh because of the infestation.

3. THE DACE (*Rhinichthys dulcis*).—Like the well-known black-nosed dace of the East this little fish inhabits cold and clear mountain streams. It reaches a length of about 5in., and is to be found in cascades and swift brooks. The fish is believed to be suitable for introduction into trout streams as food for trout.

4. THE BROOK MINNOW (*Agosia nubila*).—This small dace-like fish inhabits brooks and swift waters, resembling the last species in appearance and habits, and was taken rather commonly also in the warm waters of Witch Creek. It belongs to the Columbia Basin, extending southward at least to Utah.

5. THE UTAH CHUB (*Leuciscus atrarius*).—The chub abounds in Heart Lake and ascends its tributary, Witch Creek, into water having a temperature of 88°. The females were full of eggs in October. In Utah Lake the fish reaches a length of 20in., and is very destructive to young trout.

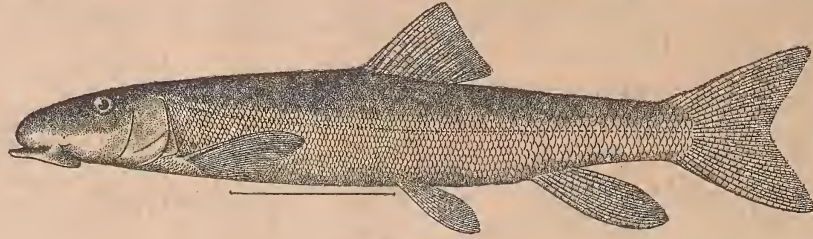
6. THE BANDED CHUB (*Leuciscus hydrophlox*).—A handsome species growing to a length of 4in. Dr. Jordan found it in Heart Lake and Witch Creek. The fish has been taken in Blackfoot Creek, Idaho, a tributary of Snake River. "Color silvery, a plumbeous lateral band, dusted with dark points; traces of red coloration on belly in largest specimen."

7. THE MOUNTAIN WHITEFISH (*Coregonus williamsoni*, var. *emontanus*).—Found in the Madison River below the falls, and attributed also to the Yellowstone. "It is a slender and graceful fish, readily taking the fly like a grayling or trout. It is most abundant, so far as we have noticed, in the eddies or deeper places in swift streams. It seems to be essentially a river fish, rather than an inhabitant of lakes." From the typical Williamson's whitefish the Park variety differs in its much more slender body and shorter fins. The Montana whitefish, described by Milner from Chief Mountain Lake, is considered by Dr. Jordan to be identical with Williamson's—a conclusion reached independently by the writer some years ago.

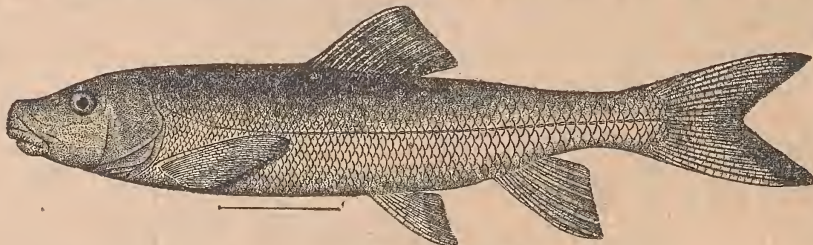
8. THE GRAYLING (*Thymallus ontariensis*).—This fine species was found abundant in the Madison below the junction of the Firehole and the Gibbon. The supply used in stocking the Yellowstone was taken in Horse Thief Spring. In the Gallatin this grayling is very common, as we have announced in FOREST AND STREAM. We cannot admit the identity of the Michigan and Montana grayling with that of Alaska; *signifer* has a much higher dorsal fin besides good character about the skull, which make its separation easy.

9. THE RED-THROATED TROUT (*Salmo purpuratus*).—Dr. Jordan refers all the black-spotted trout native to the Park waters to a single species, the *purpuratus* of Pallas, for which he uses the doubtful name *mykiss* of Walbaum. Variations in the number and size of the black spots are common, but the essential characters remain the same. Yellowstone Lake is believed to have been stocked originally from Snake River, through Pacific Creek, Two Ocean Pass, and Atlantic Creek, and an interchange of individuals across the Continental Divide is still a probable occurrence. The existence of a tape worm in this trout was discussed in our columns of Oct. 22. "The wormy trout are leaner and more compressed than others, and the sides of the belly are likely to show ridges and lumps. The flesh is said to be redder in the diseased fish, and the external color is more likely to be dusky or brassy." Spent fish are probably more likely to be wormy.

10. THE MILLER'S THUMB (*Cottus bairdi*, var. *punctulatus*).—This pest of salmon and trout waters abounds in the grassy bottoms of Madison River, Gibbon River, and



1. GRAY SUCKER.



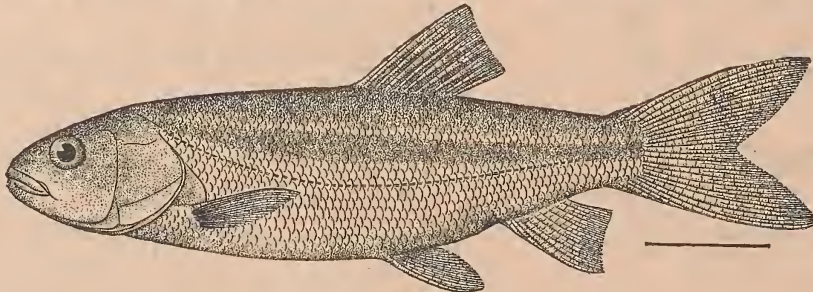
2. RED HORSE SUCKER.



3. DACE.



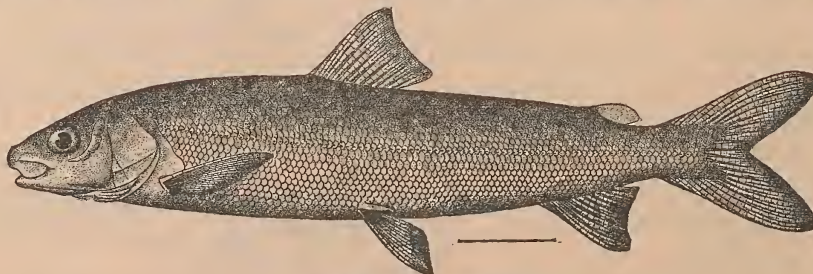
4. BROOK MINNOW.



5. UTAH CHUB.



6. BANDED CHUB.



7. MOUNTAIN WHITEFISH.

the throat. "The trout of the Yellowstone Lake and of many of its tributaries above the falls are infested by a parasitic worm (*Dibothrium cordiceps*)," which has been

made the subject of a special report by Prof. Edwin Linton. "In the trout examined the presence of many worms was accompanied by a shrunken or irregular

condition of the ovaries or testes. Perhaps spent fish are more likely to be wormy. According to Mr. Arnold Hague, the best trout are in swift or deep waters; the

wormy ones about eddies or among logs or masses of floating vegetation. The wormy trout takes the fly freely, but is in general little gamy. In fact, all the

Yellowstone trout seem less active than is usual for the species." Dr. Jordan accounts for the presence of the blob in Gibbon River above the falls by its probable trans-

portation from lower waters by the osprey or some other fish-eating bird. The article is accompanied by a map of the Park, figures of all the fishes, and many plates showing the obstructions limiting the natural distribution of fishes.

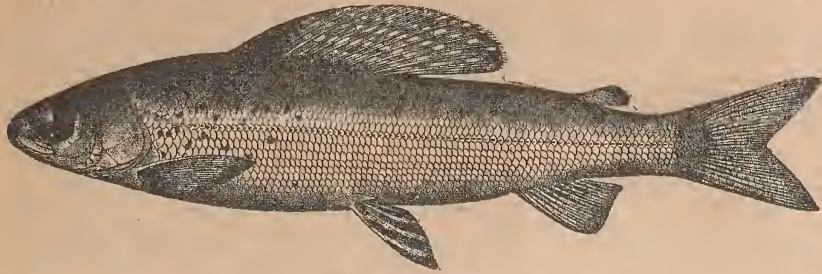
1. THE GRAY SUCKER (*Catostomus griseus*).—Small examples of this sucker were found abundant in the Yellowstone and Gardiner rivers below the falls, and the young were caught in large numbers in Gardiner River

below the lake. One of the species of sucker was found to be infested with a flat intestinal worm, sometimes reaching a foot in length, but apparently not affecting the health of the fish. The large chub of Heart Lake and Witch Creek (*Leuciscus atrarius*) was full of eggs at the end of September, unusually late in the year. About the whitefish Dr. Jordan reports as follows: "The mountain whitefish is abundant in the Madison River below the falls. It is said to be equally common in the Yellowstone, but none were obtained by us. It is a slender and graceful fish, readily taking the fly like a grayling or trout. It is most abundant, so far as we have noticed, in the eddies or deeper places in swift streams. It seems to be essentially a river fish, rather than an inhabitant of lakes." "The grayling is very abundant in the Madison River below the junction of the Firehole and the Gibbon. Numerous specimens were collected for us in Horse Thief Spring, a small stream just outside the limits of the Park, by Mr. Lucas. The grayling is said to ascend the river in summer as far as the Firehole Falls and Gibbon Falls. It is said also to

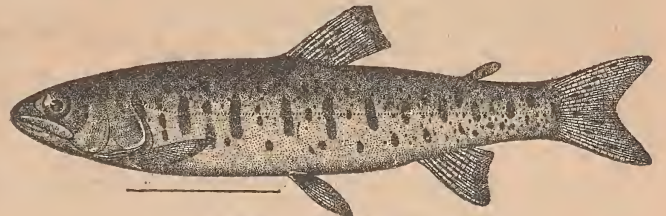
Cañon Creek. In Gibbon River it occurs both above and below the falls and may have been transported over the barrier by some fish-eating bird. As a destroyer of eggs and young fish the Miller's thumb perhaps has no equal. Commissioner McDonald has seen one of moderate size

waters of North America, one of the species extending southward as far as the Alabama River. One variety is frequently found in caves in the limestone region from Indiana to Tennessee. None of the blobs much exceed 7 in. in length; some of the largest examples we have

tiveness to eggs and young of the salmon. The rainbow (*Salmo irideus*) is equally destructive. The young fry are devoured in enormous numbers by fish-eating birds. In the region referred to the writer has shot gulls and terns, and on holding them up by the legs young salmon



8. THE GRAYLING.

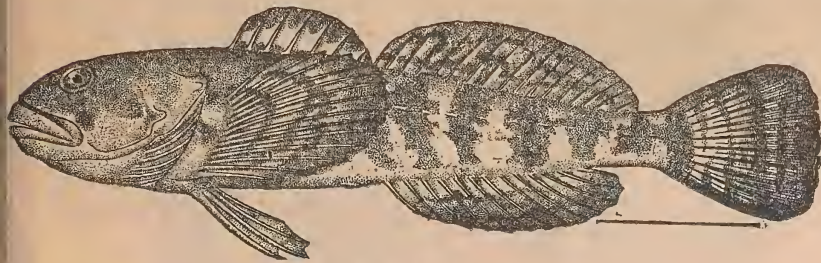


9a. RED-THROATED TROUT (YOUNG).

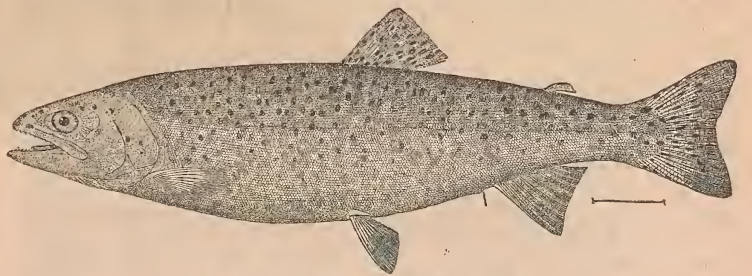
eat scores of young trout almost in the twinkling of an eye, and the writer has observed salmon nests that were entirely stripped of eggs by the same insidious and ubiquitous marauder. Wherever salmon and trout are found in America it is safe to say that the

seen are from Wytheville, Va. The species are usually represented by vast numbers of individuals, making up by numbers what they lack in size, and it is almost impossible to exaggerate their power for mischief. Around the margin of Karluk Lake, Alaska, we have seen nest

dropped out of their mouths. Near the river mouths marine flounders and sculpins enter the brackish water and feed upon young salmon. In the ocean seals and sea lions continue the destructive work. The adult fish, when entering the rivers for the purpose of spawning,



10. MILLER'S THUMB.



9b. RED-THROATED TROUT (ADULT).

Miller's thumb may be seen keeping the species in check. About twenty species of blobs are recorded in the latest catalogue of the fishes of North America, and one of these, *Cottus richardsoni*, runs into nine varieties. These fishes are now placed in the genus *Cottus*; but were formerly united under the name *Uranidea*. There are several sections of this genus, those containing the largest number of species being *Potamocottus* and *Uranidea*. The one described above belongs to *Potamocottus*. The blobs are found in nearly all the fresh

after nest of the red salmon emptied of eggs by these small fishes. The eggs are rapidly digested, and the capacity of the blob for the destruction of salmon is greatly increased by this circumstance.

In FOREST AND STREAM of April 3 and 10, 1890, attention was called to the vast number of enemies against which the salmon has to contend for its existence. On the spawning grounds are the blobs, and, besides these, are the black-spotted and red spotted trouts of the region. The Dolly Varden (*S. malma*) is famous for its destruc-

must run the gauntlet of incessant seining across the river mouths; they must endure the hardships incident to the ascent of the rapid and rocky streams; and when they reach the shoal waters in which their eggs are deposited bears await them, to give the finishing touches to the work of destruction. If we add to all of these hardships and death-dealing agencies the obstructions and pollutions of salmon streams in populous regions, the wonder is that any of the anadromous salmon are left to reproduce their species.

T. H. BEAN.

CHICAGO AND THE WEST.

CHICAGO, Ill., Nov. 26.—Mr. Jeff. Smith, whose petition for appointment for fish warden for work in the Fox Lake district was mentioned last week, has just received his commission from the Governor. He starts the first of next week for the lake country, where the cold weather has already frozen some of the lakes hard enough for ice fishing. He will finish his work of warning the residents against ice fishing, and will look out to see whether any parties already warned have begun to fish. He says he will stop this fishing before it begins, if possible. Jeff. Smith should not be mistaken for his cousin, Ike Smith, who keeps a summer resort hotel, over beyond George Clark's. It is Ike Smith who is too lazy to fish through the ice, and not Jeff. Smith. The latter will see to it that nobody, lazy or otherwise, fishes through the ice up there, he says. Jeff. Smith lives in Chicago most of the time and has property there, but also owns property near the neck of Catherine Lake. He tells me that he has already been approached by several of the residents who want to know whether there "would be any trouble" if they should set out a few lines "just to catch a few fish to eat." He told them there would be. That "fish to eat" plea is very threadbare, likewise very transparent.

Last week I offered a short letter from Dr. Bartlett, bearing on a damage suit brought against him in Schuyler county. Some time ago mention was made of the \$5,000 damage suit brought in that county by a market-fisherman by the name of Smith. Not being clear as to which suit was which, I wrote to Dr. Bartlett for information. It seems that these two cases are the same, and that the \$5,000 has dwindled down to a \$62 verdict, with a new trial on that, as the following letter will show:

ILLINOIS STATE FISH COMMISSION—Quincy, Ill., Nov. 21, 1891.—The status of our case in Schuyler county is about as follows: Smith, of Meredosia, owns or claims to own the fishing right in a portion of what is known as Coal Creek; across this creek, which is quite wide—large enough for a steamboat to go into it—he places a combination pound and wing-net, wings from not entirely across one side of stream and within a few feet of the shore on the other side. We were advised of this net being there, and I ordered the Lotus there and wardens to take it up, which they did, taking net to Beardstown for safekeeping. Smith replevins the net and sues myself and others for trespass to a close, or in other words, going on to an inclosure and committing trespass. Damages claimed, \$5,000. A jury gave the plaintiff, Mr. Smith, a verdict for \$62, which we accepted to, and upon argument for a new trial it was granted. An indictment has been found against Smith for violation of the law in setting his net in said Coal Creek, and will be tried next term of court. Fishing still good at office here, two gentlemen of New York making a nice catch there a few days ago.—S. P. BARLETT.

The last sentence of the letter has reference to the official joke of the Illinois Fish Commission, which I have detailed earlier as duly investigated by myself. For fuller particulars apply to the two gentlemen from New York. To-day I talked with Mr. W. H. Haskell more fully about the "landlocked salmon" in Trout Lake, Wis. It seems that one of these fish was sent to the Smithsonian Institute, and reply was received that it was neither the landlocked salmon nor the lake trout. No further description was vouchsafed. The fish, as described by Mr. Haskell, has a general silvery tone of body, with large bluish or purplish spots, black in the center. The flesh ranges, like that of the brook trout, from nearly white or faint pink to deep salmon color, according to the individual. It is very delicious eating. The highest weight reported is 224 lbs. In the fall, after the close of the

spawning season, these fish spread all over the lake, feed on the surface and break water in schools. They can then be taken on the fly or the spoon. After that they seem to sink and spend the year in deep water. Trout Lake has outlets, but this fish is not reported from any connected water.

E. HOUGH.

ANGLING NOTES.

STRIPED bass are still being caught in considerable numbers in the Hudson River, particularly off Sing Sing. They are found in the deep channels, and take sand worms in preference to any other bait. It is unusually late for them to be taken on the rod and reel, and while they undoubtedly remain in the river all winter, they will soon stop biting.

Inquiries for tarpon tackle are beginning to be made at the fishing tackle stores and already a number of ardent fishermen have left for Florida. Many changes and improvements have been made in the tackle used for the big herring, particularly in the way of snelled hooks. The cumbersome and expensive chain has had its day, the linked wire, rubber-covered snell and many others have been tried and found wanting; the latest and best seems to be the braided linen snell wrapped with copper wire. This snell is hitched to a special hand-made forged steel 10 1/2 hook. The wire winding should commence about 5 in. above the hook. The object of this is to allow a shark, if hooked, to bite off the snell, and to prevent its being chafed off by the rough lips of the tarpon. Of course the tarpon is allowed to swallow the bait and the unprotected part of the snell passes into its throat. This is the rig used by Dr. Grymes and other expert tarpon fishermen.

Fishermen should remember that these fish are big and powerful fighters, and that it is useless to expect to kill them with cheap tackle. Many anglers have been disappointed after going to the expense and trouble of a trip to Florida, to find that they lost most of their fish; in fact, I know several fishermen who, while they struck a number of tarpon, never saved a single one. Some lost them because they got "rattled," but in most instances it was due to cheap reels and lines. Cheap reels become useless with the first run of these big fish, the spoon expands under the pressure of the swelling lines, for all lines will swell when wet, particularly the cheaper grades, and the line, of course, parts at once when the reel fails to work properly. The reel should be large enough to take 600ft. of first-class linen line not smaller than No. 18 or better No. 21.

With proper tackle and a little experience in handling large fish there is little risk of losing even a 200 lbs. tarpon. Another cause of these fish breaking away is the use of too stiff and too short rods; if the rods have a little spring they are not half so apt to tear out. Some of them are made so stiff that they do not give a particle, and this affords the fish too much purchase and brings all the strain on the line. Mr. John G. Hecksher's pattern of rod seems to have given the best results, for while considerably stiffer than a striped bass rod, it still has a good deal of spring.

SCARLET-IBIS.

DERRYFIELD BEEF.

CHARLESTOWN, N. H., Nov. 27.—Editor Forest and Stream: Thanks to "Kelpie" for supplementing my memories of William Stark's poem; he is all right as far as he goes, but the whole poem would fill a page of FOREST AND STREAM. Some of it was genuine poetry, too, for Stark was a talented man, though eccentric, and his brain finally gave way, and he died in an asylum.

I knew him well, and remember his stocking a deer park in the suburbs of Manchester with a herd of elk from Wisconsin some thirty years ago, and visiting it with him to see them one bright morning in the early "sixties." He also had some rare wildfowl and a trout brook. He was years in advance of Austin Corbin and many others.

The poem referred to Manchester, New Hampshire—not Massachusetts, as printed. The country right around Amoskeag Falls was called "Derryfield," being an outlying district of the old town of Londonderry, Ireland, originally settled by emigrants from Londonderry, Ireland, commonly known as the "Scotch-Irish." They were strong men, and left a mark not only on the history of the State but of the Union.

The names of McNeill, McClary, McCrillis and McGaw are well known beyond the limits of New Hampshire.

Some of the same emigrants found their way over to the western edge of the State, and "Derry Hill," in our neighboring town of Acworth, marks the site of their farms, though the name of old "Deacon Finlay" is the only one I can recall.

I should like to meet "Kelpie," for we have evidently "camped on the same trail;" and if FOREST AND STREAM plants that bivouac at Chicago at the Exposition in 1893, and "the Pibroch of Donnil" calls the clans together, I hope that those of us who are still in the flesh may get together round the camp-fire and form a personal acquaintance with each other. I should hope to see "King-fisher" and "Avaahsoose," too, and the genial poet from Louisiana, as well as "Bourgeois" and "Pisco;" but we should miss and mourn those, who, like "Nessmuk," "Wells" and "Ned Buntline," have already gone to the "happy hunting grounds." How man's visions of a future life are colored by his tastes in this one. To the wild Indian it is an eternity of field sports with his favorite horse and dog. To the music-loving Jew it is an everlasting sacred concert, which would be apt to pall on unmusical organizations. Who can tell? VON W.

TRULY ODD IF ODDLY TRUE.

W. R. Davidson, a well known citizen of South Nyack, went out on the river this morning to lift one of his "set lines" and was surprised to find on the end of the line one of the largest sea gulls ever seen in this part of the Hudson. The bird had probably made a dive into the water for a fish and caught one which was fast to the hook. The hook caught in the bird's mouth and held him there until Mr. Davidson's arrival. The gull will be kept alive by his captor.—New York Times.

FOREST AND STREAM, Box 2,632, N. Y. city, has descriptive illustrated circulars of W. B. Leffingwell's book, "Wild Fowl Shootings," which will be mailed free on request. The book is produced by "Nant," "Glean," "Dick Swiveller," "Sybillene" and other competent authorities to be the best treatise on the subject extant.

A BOOK ABOUT INDIANS.—The FOREST AND STREAM will mail free on application a descriptive circular of Mr. Grinnell's book, "Pawnee Hero Stories and Folk-tales," giving a table of contents and specimen illustrations from the volume.—Ad.

THE VELVET TRAIN of the Monon Route between Chicago and Cincinnati offers the best and most luxurious service obtainable between those points.—Ad.