

dues are \$1, which also covers the membership fee. We of course want help financially. If you can organize a club of members, and send amounts of subscriptions with names and address to Mr. John Wilkinson, of Parkhurst & Wilkinson, No. 150 Kinzie street, Chicago, the membership tickets will be sent to subscribers. Have received material assistance in this way from E. gin.

Regarding the fishway in the dam belonging to the State at Dayton it was put in this fall, and is claimed to be of such construction as to permit free passage. Will, however, write to Col. Bartlett for his report of it, and will write to you later.

Will be pleased to hear further from you at any time, and will take pleasure in reporting to you the work accomplished from time to time. Yours very truly,
C. F. HILLS,
President Fox River Fish and Game Association.

It should be added that the remark in the Sandwich letter in regard to the inactivity of our Fish Commissioner, Mr. Bartlett, is innocently wrong. Mr. Bartlett has been unable to act from want of funds. This the Association have clearly recognized, as may be seen by references above.

The *Daily News* of this morning, under the heading of "Many New Laws Needed," has strong reference to the need of new game laws. The article shows seven counties to be a unit on the matter agitated by the Fox River Association. The shooting and fishing clubs are falling into line. Let the politicians take note, and also fall into line. If they do not, they may see the day when they will wish they had.

CHICAGO, Ill., Jan. 10.—Mr. D. L. Barclay, president of the Waltonian Club at Fox Lake, started yesterday from his home at Elgin, Ill., for a trip to the Pacific coast country.

Fishing through the ice will soon begin on the inland lakes now, and there will be slaughter unmeasured of fish life till the ice breaks again. To-day cold weather has struck this place for the first time this winter, although it is not yet severe and may warm up again. Yesterday there was a melting snow; two days before that were rainy, and up to that time our weather here had been like that of a pleasant fall. It is almost unprecedented here. Should these fair days begin again the season will be most favorable for our game and will give the ice fishers at best only a limited chance for their butchery.
E. HOUGH.

No. 175 MONROE STREET.

LANDLOCKED AND ATLANTIC SALMON

IN November last Commissioner E. M. Stilwell, of Maine, requested Mr. Robert Edes to send to the U. S. National Museum a pair of the large landlocked salmon which were at that time spawning in Sebago Lake, Maine, and he asked for information about the relationship existing between the landlocked and marine forms of the *Salmo salar*. This relationship has been a fertile source of interest and inquiry among anglers and fish-culturists, and the fine specimens sent from Maine furnish an excellent opportunity to make a comparison between fresh individuals of the two races.

It may be as well to state by way of preface that students of fishes are united in their belief in the specific identity of the sea salmon and the landlocked salmon, or winninish. The differences between the two are limited to form and coloration, and in some waters, size of individuals. These are characters of little value, and may be observed in other species of the salmon family, both in a state of nature and under domestication. The landlocked salmon is equally well known in Europe, and especially in lakes of Scandinavia. It must be remembered that the colors have changed somewhat since the fish came out of Sebago Lake. Mr. Edes says: "The natural color of these fish when in good condition is about the same as the Pennobscot sea salmon; in fact, it would be hard to distinguish one from the other by their color when taken in the months of May, June or July."

Early in November, 1887, Mr. E. G. Blackford sent to the National Museum a spent male salmon that was caught in a net along with striped bass at Port Monmouth, N. J. This was a remarkable fish, both on account of its condition and the unusual place of its capture—no salmon having been taken there before. The lower jaw had a slight cartilaginous tip, which could be received into a half-round cavity in the snout. The teeth in the middle of the roof of the mouth, in a long double series, were entirely imbedded in thickened skin. The sides were marked with moderately numerous black spots of irregular shape and with a larger number of vermilion spots. The bone covering the gills had two moderate sized black blotches, nearly round, and encircled by a narrow border of orange, besides two smaller spots similarly surrounded, and many blotches of orange brown. The cheeks had numerous spots of orange brown. The tail fin with many vermilion spots and streaks. There were several streaks of vermilion on the base of the large back fin, and five black blotches, all encircled by a narrow orange brown border.

The landlocked salmon received from Mr. Edes were taken in the height of the breeding season and were considered large fish in the museum, but Commissioner Stilwell states that larger ones were not uncommon, some even weighing 25 or 30 lbs. The weight of the male was 17 lbs., of the female 13. In the male the skin is everywhere thickened by an accumulation of adipose tissue; the scales are scarcely perceptible on this account. The fins are much swollen, particularly along their basal portions. The connecting membranes between the rays are so infiltrated with fatty tissue that it is almost impossible to count the rays without dissection. The tail when expanded is nearly truncate. The last ray of the large back fin is split into two parts, the posterior of which is a thickened adipose strip, much slenderer at the point than at the base. Strong teeth are present in the middle of the roof of the mouth in a single short series, but almost entirely concealed in the thickened tissues. The teeth in the front part of the upper jaw are in a band 1½ in. long; the first and third teeth of this band are enlarged and canine-like. Four teeth are on each side of the tongue. The teeth of the lower jaw are scarcely enlarged beyond their normal size when not breeding. The sides of the head bear many dark brown spots, which appear to have been to some extent surrounded by pinkish life. The largest of these spots is nearly two thirds as long as the eye. A few of the spots are nearly round, but most of them are irregular in outline. The sides of the body contain numerous brown spots, some of which have become confluent; none of them are as long as the eye, and most of them are very much smaller. These spots are most abundant in front of the large back fin, and do not extend far above or below the middle line of the body. The length of this male was 32½ in.

The female was 30½ in. She was full of ripe eggs, which averaged about ½ in. in diameter. The weight of the ovaries was 2½ lbs. The left ovary was 15 in., the right 12 in. long. The number of eggs by actual count is 9,542. As in the male, the skin has been rubbed off both jaws, leaving the bone exposed. At the base of the breast fin there is a space denuded of skin nearly as long but not so wide as the eye. The upper edge of the pectoral is also bare. The ends of the rays of the tail fin are much worn and the skin is wanting. Small bare patches are present also at the front of the belly fin on each side. The jaws are not elongated as in the male, nor are the teeth increased in size. The teeth on the tongue are almost concealed in fatty tissue, but the other teeth are less deeply imbedded than in the male. Teeth in the middle of the roof of the mouth in an irregular patch nearly 1 in. long, while the series at the sides of the roof of the mouth are 1½ in. long. The colors are less brilliant than in the male. The head contains fewer spots and these are almost concealed in the general dusky coloration. The body also is less profusely spotted, and there is an entire absence of the pinkish tinge of the male. The body spots, as a rule, have no intermixture of large ones. There are a few very small dark spots on the large back fin.

The male salmon in the breeding season of course has the jaws greatly prolonged, the upper jaw being nearly twice as long as in a female of equal size; but at other times the male is readily distinguished by the greater length of the upper jaw and of the breast fins, as well as by the much shorter distance between the vent and the tip of the extended belly fin; in the male above described this distance is 1½ in., in the female, notwithstanding its smaller size, it is 2½ in.

We regret that the comparison here given is not complete, but if some one who has the opportunity will put on record similar data for the breeding sea salmon we shall have means of distinguishing the two forms if this is possible.

RUBBISH IN THE THAMES.

IN his report to the Board of Trade, by Mr. C. E. Fryer, Inspector of Fisheries, on the injury alleged to be caused to the fisheries by the deposit of rubbish in the estuary of the Thames, Mr. Fryer states that the house and street refuse barged away from London and deposited in the Thames, and especially the former, are causing great complaints among the fishermen, whose business is thereby affected. The fishermen hold that the fish are driven away or killed and their food destroyed by the rubbish; also that their nets are damaged by it. The trawlers are the principal sufferers. "In some places the accumulations are so solid that the nets get fast in them. In other cases the mouth of the net is choked so that the fish cannot enter, or it becomes so laden with heavy jagged articles that it chafes and tears itself to pieces along the bottom." Trawls full of shrimp are often smashed by contact with foreign bodies, and nets full of fish are frequently rent and their contents lost. The dredgers on the oyster beds of Whitstable and vicinity lose much time and labor by bringing up tin pots and crockery with or instead of their oysters. A more serious injury, however, is that threatened to the oyster beds themselves by the deposit of sediment thereon. The fisheries injuriously affected by this rubbish are valued at \$750,000 a year.

Besides the injury to the fisheries the sanitary authorities of Sheerness and vicinity complain of the nuisance and possible danger to health, caused by the accumulation of decaying animal and vegetable refuse dumped from the barges.

Mr. Fryer does not find adequate means of remedying this evil by existing laws, but recommends certain legislation to promptly stop "a great and growing nuisance."

LAKE AND BROOK TROUT HYBRID.

SEVERAL hybrids between the lake trout and the brook trout were received at the Central Station of the U. S. Fish Commission in Washington, Jan. 3, 1889, from the Pennsylvania State Hatchery at Corry. At the same time and from the same source were obtained six large lake trout, six rainbow trout and six brook trout. These fish were secured through the request of Col. John Gay, of the U. S. Fish Commission. They furnish a beautiful illustration of the skill in rearing trout manifested by the superintendent of the Corry Station, Mr. William Buller.

The brook trout are gorgeously arrayed in their nuptial colors, and are as plump as good feeding and pure water can make them. The milky white margins of the lower fins are well contrasted with narrow pencilings of black, and the sides are aflame with warm vermilion. The olive green of the back is closely vermiculated with lighter markings, and the back fin is richly variegated with olive green and velvety black. The vermilion spots of the sides are absorbed in the general wealth of vivid color.

The rainbow trout are not yet at the summit of their beauty, but the crimson bands along the sides and head are beginning to give promise of brilliancy.

The lake trout are big, handsome fishes, although somewhat plain in their simple livery of gray and white.

The hybrids, however, are more attractive than any of the others, because of their known ancestry and their singular beauty. These trout are now five years old. They are the result of fertilizing lake trout eggs with the milk of the brook trout. The history of the experiments in hybridization is to be found in the report of the Pennsylvania Fish Commission for 1886.

The larger of the two hybrids is about 20 in. long. It is apparently a male, as the lower jaw has an incipient cartilaginous tip. The end of the upper jaw extends behind the eye a distance nearly equal to the length of the snout. The scales are larger than in the brook trout and about as large as those of the lake trout. The tail fin is forked about as deeply as that of the lake trout. In shape the hybrid is similar to the lake trout, as also in the general pattern of coloration; but the very numerous spots on the sides are somewhat smaller, and pale lemon in color instead of whitish. The spots below the middle line of the sides have a center of orange. The fins on the breast, belly, behind the vent, and the lower lobe of the tail fin, have a broad white edge. The fins on the belly and behind the vent are pale vermilion orange. The outer half of the upper surface of the breast fins is dusky. There is a narrow black line limiting the white of the

belly fins, and a similar trace bounds the white of the fin behind the vent. The ground color of the sides is greenish olive. The sides of the head have numerous spots of lemon yellow, some of them larger than the largest of those on the sides. The lips are yellowish flesh color. The eye is golden with a dusky border. The top of the head and back have some scattered vermiculations like those of the brook trout, but much less developed and not so plentiful. The tail fin and both fins of the back are spotted with lemon yellow like the sides.

The smaller of the two supposed males has the back slightly elevated as in old male brook trout, but its tail fin is forked and it has the largescales and peculiar coloration of its brother hybrid. As long as these beautiful fish live we cannot inquire very closely into their dentition and visceral anatomy, but we may be sure that something of interest will be discovered therein when these parts are available for study.

EXPERIENCE WITH THE STEEL ROD.

Editor *Forest and Stream*:

Last season I tried a Horton steel rod and formed some very decided opinions, pro and con, in regard to it, which may be of interest not only to many of your readers, but to the manufacturers, who, I believe, invite criticism with a view to eventually making the rod perfect: a consummation to be earnestly hoped for, as the advantages of a satisfactory rod made of some kind of metal would far exceed those of one made of wood.

The advantages of the Horton rod are its greater strength and durability; its telescoping arrangement which obviates the use of ferrules and makes the rod as convenient to carry as if but one piece; the running of the line through the interior, thereby dispensing with the inconvenience of guides.

The defects of the rod, as appeared to me, are, first, its top-heaviness or want of proper balance; second, its stiffness or lack of necessary pliancy; third the greater friction of the line; fourth, rust; fifth, the inevitable wearing off of the protective coating by the rubbing of the surfaces in drawing the parts out into position for use; sixth, too short a space between the reel and where the line enters the rod, making it more difficult to draw the line from the reel.

As to the want of balance and flexibility, it may, no doubt, be remedied by gradually reducing the thickness of the metal from one end to the other of each piece. I found by a test that the stiffness of the rod was about twice that of a Henshall minnow rod, and for bait-fishing that is an unpleasant difference, while for fly-fishing it would not do at all.

The amount of line friction is, by a careful test which I made, just double that of the Henshall rod. This may not be objectionable in a fly-rod, but for bait-casting from the reel and some other methods, it is out of the question; and when the line becomes wet, as it must, the friction is increased to such an extent that the line can hardly be forced to render.

It is needless to talk of coating the rod with anything to prevent rust. Any coating—even nickel-plating—would soon be worn off; especially on the inside by the attrition of the line. The angler could be provided with something to replace the coating on the outside, but the inside would probably be beyond his reach. It is impossible to prevent rust by keeping the interior of the rod dry, because the line must make it wet.

In regard to the shortness of space between the reel and point at which the line enters the rod it may be merely an individual opinion arising from the use of other rods; but in any case it is an objection which is not without remedy.

My decided opinion is that for a bait-rod the telescoping system will have to be abandoned and ferrules and guides employed. Both ferrules and guides may be soldered on, or the ferrules may be put on with cement in the usual way and the guides may be ringed. Ringed guides to slide on and off might be used with the telescopic plans, but I do not think that it would be desirable. Even for the fly-rod I am inclined to think that it would be best to adopt the ferrule, notwithstanding the convenience of the present method. If best to adhere to the telescopic method, or indeed in any case, why would it not be better to make the rod of brass?

I present these views to the consideration of practical anglers, hoping that they are sufficiently interested in the success of a metallic rod to give their opinion of what I have said and also any ideas of their own.

SPLASHER.

"THE COMPLEAT ANGLER."

THE ONE HUNDRETH EDITION OF WALTON AND COTTON.

THE scholarly angler, as well as the scholar who is not an angler, takes great delight in fine editions of Izaak Walton and his younger companion, Charles Cotton, who is sometimes called "the father of fly-fishing." A modest angling book published in London in 1653, which has been edited by many other anglers and been republished in Edinburgh, Philadelphia, Manchester, New York, Liverpool, Halifax, Hamburg and Boston, until in the past year it has reached its one hundredth edition, may truly be called a classic.

In the volumes now before us*, we have the most elegant reproduction of this famous work, edited by one of the most scholarly anglers of the day, in demi quarto on large paper, which has yet been issued. The edition is strictly limited to 500 copies, each of which bears the autograph signature of Mr. R. B. Marston, the editor. The volumes are in boards, with uncut edges, suitable for rebinding in such style as the owner may prefer, and the American copies are in the hands of Messrs. Dodd, Mead & Company, New York.

The plan of making the illustrations of scenes on the rivers Lea and Dove, where Walton chiefly fished, has been carried out, and they are gems, whether we consider the full-page photogravures or the smaller wood

*The Lea and Dove edition, being the 100th edition of *The Compleat Angler* or the *Contemplative Man's Recreation*, being a discourse of rivers, fish ponds, fish and fishing written by Izaak Walton, and instructions how to angle for a trout or grayling in a clear stream, by Chas. Cotton—edited and arranged by R. B. Marston, editor of the *Fishing Gazette*, honorary treasurer of the Fly-Fishers' Club etc., with fifty-four photogravures and about one hundred wood cuts—and containing a reprint of *The Chronicle of the Compleat Angler*, a Biographical Record of its various editions and imitations, by T. Westwood and T. Satchell. In two volumes. London: Sampson Low, Marston, Seale and Rivington, Limited. St. Dunstan's House, Fetter Lane, E. C. 1883.