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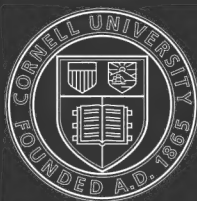
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THE SALMON.

EDINBURGH : PRINTED BY THOMAS CONSTABLE,

FOR

EDMONSTON AND DOUGLAS.

LONDON .	HAMILTON, ADAMS, AND CO.
CAMBRIDGE .	MACMILLAN AND CO.
DUBLIN .	M'GLASHAN AND GILL.
GLASGOW .	JAMES MACLEHOSE.

THE SALMON

BY

ALEX. RUSSEL

EDINBURGH

EDMONSTON AND DOUGLAS

MDCCLXIV.

NOTE.

PORTIONS of this Volume have appeared in the *Quarterly Review*, *Blackwood's Magazine*, the *Edinburgh Review*, and the *Scotsman*.

A. R.

SCOTSMAN OFFICE,
EDINBURGH, *May* 1864.

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CHAPTER I.

VALUE OF THE SALMON.

Property—Employment—Food—Sport.

THERE are at least two respects in which the subject of Salmon is important, and two in which it is interesting. It is important commercially, the salmon fisheries forming ancient and valuable property, a large means of employment, and a very considerable supply of food ; somewhat less important as furnishing an old and keenly-relished sport, the privilege of exercising which has become a sort of property superadded to the value for purely commercial uses. It is interesting as involving some of the strangest facts, the most instructive experiments, and the most perplexing mysteries in natural history ; and as having within these few years undergone investigation more searching and legislation more vigorous than for centuries before.

The subject, too, is especially a British, or British-and-Irish one—still more especially a Scottish one. The great majority of countries have by nature been cut off from direct interest and from any kind of power in the matter, and no country has an interest at once so great and so imperilled as our own ; for upon few nations has the gift of the king of fish been conferred,

and by almost no nation more than this has that gift been neglected and abused. The great nations of the past, like Rome and Persia, longed to possess, the great nations of the future, like Australia and New Zealand, are labouring to obtain, what we have been carelessly losing, or even wantonly destroying. When the patriotic Fluellen, in his eagerness to establish a parallel between Henry of Agincourt and "Alexander the Pig," not content with alleging that there is a river in Macedon, and "also, moreover," a river in Monmouth, ventured to add that there were "salmons in both," he not only belied the high testimonial he had given himself as "a goot man in all particularities," but did injustice to the rarity and value of a privilege intrusted, not altogether worthily, to the now United Kingdom. For he was entirely wrong in the particularity of there being, or ever having been, "salmons" in the rivers of Macedon, or indeed in any of the waters that feed the Mediterranean,—a deprivation all the harder upon the natives of those regions that, as appears pretty clearly from history, the Macedonians centuries ago, appreciated and practised the art of angling, being apparently one of the very few nations that borrowed that important portion of civilisation from the Egyptians, who were the first, and perhaps for many ages the only people, that "cast angles into the brook." When Alexander, leaving salmonless Macedonia behind, led the way to the far East, he was unconsciously going in the wrong direction; for there are no salmons in the Ganges either, and his "royal feast for Persia won" must have been wretchedly defective in its second course. More wise and fortunate was Cæsar,

who turned his attention to Gaul and Britain, and whose soldiers had no sooner reached the banks of the Garonne, than the saltatory motions of the salmon cleaving his joyous way through the fresh water, after his sojourn in the ocean, excited their attention, admiration, and appetite, and procured for him the specific name which has since stuck to him, and to which, though by reason of persecution greatly distressed both in body and mind, he still continues to do justice. We cannot be quite sure that Cæsar ever dined off salmon, nor even that information on such a point could be procured from himself, did we know his present address, for he was one of the very few great men of history who were neither powerful nor particular at table. But we are warranted to please ourselves with conjuring up the image of the Roman soldiers, as they kept watch and ward by the wall of Hadrian and of Antoninus, ever consoling themselves with a cut from the "tail-scud" of a twenty-pounder, prepared in those three-legged camp-kettles which appear to have been designed for the very purpose. And we can feel sure, too, of the contempt with which those old campaigners would look down upon the blinded and besotted aborigines of Northumberland and the south-eastern counties of Scotland, who, among other odious and unaccountable peculiarities of habit, are more or less authentically recorded to have entirely abstained from the use of fish. Can it be possible that the modern "black-fishers" of the Teviot have in their veins the smallest tincture of the blood of these non-ichthyophagous barbarians? In the interest alike of mankind and of fishkind, it is to be desired that they had; that the breed

had been kept pure, and the custom sacred. But to have done with the ancients, both foreign and domestic, although rumours of the delicacy of the salmon reached the Romans like a sweet-smelling savour,—though Pliny recorded what he knew of its habits, and Ausonius sang of its beauties and edible qualities,—and a demand for the article instantly sprung up among that knowing and luxurious people, supply for once did not follow demand, because the Alps intervened, and because the secret of packing in ice was only discovered by a Scotch laird, called Dempster of Dunnichen, about 1780 years too late for the Roman markets.

Putting together all the evidence that has come down to us, in history, poetry, and ancient laws, the conclusion is that the Three Kingdoms, but more especially Scotland, have from the beginning hitherto been pre-eminently the kingdoms of the salmon—at least, if we take into account consumption as well as production. In old times we obviously had a great comparative superiority over the two or three countries that could then be called our neighbours, and though we have undergone an alarming decay, our superiority as compared with neighbours—Norway, perhaps, excepted—is greater than ever, some nations having decayed much faster than we, and others having reached that extinction to which, until lately, we were only hastening. It is clear that, from Scotland at least, there was in old times a large export of salmon (chiefly salted), many curious proofs of the fact being found among the old Scottish statutes; and it seems almost equally clear that England also had an over-abundant supply, except in those districts far re-

moved from the fisheries. If we do not now supply foreign markets, it is not because there is no foreign demand, but because we have not enough for our own supply, even as a costly luxury. Great Britain, in truth, has become more than ever *the* salmon-producing and salmon-eating country of the world, and when the fish ceases from among *us*, the end of all salmon is at hand. True, we are told by Sir John Ross that the production of salmon in the Arctic regions is so great that in Boothia Felix 100 lbs. can be bought for a knife (knives are scarce), and that they are eaten to such an extent that he saw an Esquimaux dispose of a stone-weight to lunch, before beginning to dine in earnest off the same dish ; and we have also heard of the abundance that prevails in Norway, and in New Brunswick and British Columbia. But, 1st, almost all those places are, or at least have hitherto been, for market purposes inaccessible : 2^d, the fish seem to be, in some of the most abounding districts, of a coarser species than that which would appear to be almost peculiar to the British rivers (indeed, so marked was the difference for the worse of the Arctic salmon, that Dr. Richardson, the naturalist of Sir James Ross's expedition, considered it quite a new species, and, by a somewhat equivocal compliment, named it the *Salmo Rossi*) : and, 3^d, the salmon abound in those regions mainly because they have not been in the habit of being caught. In Norway, fish have been becoming rapidly more scarce since ever our own anglers taught the natives the way and the advantage of killing them ; and one of the latest books regarding the salmon regions of North America (Hind's *Labrador*) shows in detail that

as North American salmon begin to come within reach of men and of markets, they disappear as rapidly as have North American deer. To what, then, do we owe it that there still remains to us in this thickly populated country a fish which has become almost extinct among so many of our neighbours? Next to the fact that naturally our supply is great in quantity as well as unequalled in quality, we owe it to the law having cared for the fish, not always wisely nor altogether well, but better than if it had not cared at all. Of late years, various malign influences affecting the salmon have increased in power, and still more lately—though not, it may be hoped, too late—legislation has sought to provide proportionally powerful preventives and correctives, into whose efficiency and deficiencies it is here proposed to make some inquiry.

Perhaps, however, there may be people inclined to ask what sufficient interest the public have in this fish to justify so much making of laws and of books. Among the answers that may be given to such a question are these: that salmon-fisheries are a property as ancient and marketable, to which the owners have as good a right, and which the law is as much bound to protect, as property in lands and houses; and further, that they provide employment, food, and sport, all these three things, and not least the last, being good things, and worthy of preservation.

The nature of the tenure of salmon-fisheries as Property is not the same in England and Ireland as in Scotland; but in all the three kingdoms the property has for several centuries been recognised by law, and passed from hand to hand in gift or purchase. In

England and Ireland, indeed, there is no clear legal distinction between a salmon-fishery and any other kind of fishery, and as a general rule a fishery of whatever kind—excepting on the coast and in the tidal parts of rivers—is an appurtenance of the soil ; but in Scotland, the right of salmon-fishing, both in sea and river, forms a property distinct from the soil, and belongs to the Crown, excluding those very numerous cases in which the Crown has conveyed the right to individuals and their heirs by express grant. It should be added, however, that in Ireland (where both the laws and customs have long been in distracting confusion) there has always been practically more of a difference than in Scotland or even England between the right of fishing in tidal waters and in rivers. The right in Irish tidal waters has been held at common law to belong, not to the owners of the soil, as in Irish rivers, but to the Crown, as do salmon-fishery rights in the sea in England, and both in sea and river in Scotland. But again, there has been this difference between Scotland and Ireland as to the law and treatment of Crown rights in salmon-fisheries : in Scotland, the right had been for the greater part granted away to private persons, and where not so granted, has not been used at all, at least not legally ; while in Ireland, except in a very few cases where the right had been granted away in ancient times, it has been held for and exercised by the public. In England, salmon-fisheries were recognised, protected, and regulated as property, by Magna Charta, and both in England and Ireland began to be legislated for as property at least six hundred

years ago ; while in Scotland the property, besides having legal recognition equally ancient, has in multitudes of cases been separated for centuries from the soil, to which indeed it had in some cases never been attached, and has scores of times been separately bought and sold, divided and subdivided. The total value of the salmon-fisheries of the United Kingdom, as property, has, owing to a variety of difficulties, never been ascertained. In England, indeed, the value had lately become so small as scarcely to be worth reckoning or asking about. Of Ireland, the Irish Fishery Commissioners reported a few years ago :—“ We have no means of obtaining an account of the aggregate annual value of the salmon-fisheries ;” but the value for Ireland has since then been stated semi-officially at about £200,000 a year, and rapidly increasing. On the other hand, a recent Return (Parl. Paper, No. 227, Sess. 1863), purporting to give the name, owner, and poor-law valuation of every fishery in Ireland, brings out the not very grand total of £12,307, 15s. ! The tremendous disparity between these two statements is in part to be accounted for by the larger proportion of the Irish fisheries consisting of what is called “ common fisheries,” and so not rateable as property, and by many especially of the bag-net fisheries being divided into such small shares as to leave no one of the owners with what is termed a “ considerable,” which seems practically to mean a rateable fishery. Indeed, we know of *one* Irish fishery, the rent of which is not much less than half of the whole sum which this Parliamentary Return gives as the rental of all the hundreds of fisheries in Ireland. All that can be

learned about the value of Irish fisheries leads to little, except the conclusion that neither of the two statements referred to—neither that which shows £200,000, nor that which shows £12,307, 15s.,—is useful for much except misguidance. In a considerably modified degree, a similar remark applies to a Parliamentary Return published in this present year, purporting to give the name, value, and mode of capture, of every salmon-fishery in Scotland. As this is the first attempt to procure official or authentic information as to the whole Scotch fisheries, it is welcome as a beginning; but it has the rudeness and imperfection of a beginning. It both omits and misstates. Many fisheries are not included at all; of nearly 700 fisheries named, the value of 80, or nearly a sixth of the whole, is not given; the principle on which the valuation is made is not stated; it appears to have been made on quite different principles in different cases; and in the great majority of cases, the statement is far below the fact. Thus, the annual profits of the Duke of Richmond's fisheries on the Spey have been stated before Parliamentary Committees, by both the late and present Dukes, to amount to close upon £13,000 (more than the value of the whole of the Irish fisheries as officially returned!); but this Return puts at only about £9000 the value of all the fisheries in both the counties in which the Richmond or Gordon fisheries are situated. The actual rental or annual value of three Scotch fishery districts—the Tay, the Spey, and the twin rivers entering the sea at Aberdeen—amounts to nearly £40,000; and yet this Return makes the value for all Scotland only £52,615.

The Return also, as being a purely Scottish Return, excludes about three-fourths of the fisheries of the Tweed, both banks of that river being politically in England for the first five miles, which comprise the most valuable fisheries. When, therefore, it is said that the total annual value for Scotland, shown by this Return, is £52,615, it has also to be said that that sum is little more than a multiplicand requiring to be operated upon by some unascertained multiplier in order to bring out a correct result. All the facts that can be got thus serve but vaguely to indicate the aggregate value of fisheries which, even confining the view to Scotland, invade almost everything that can be called river, and sentinel at close though irregular intervals at least a thousand miles of coast. It is enough, however, for present purposes, that the salmon-fisheries of the United Kingdom form a property indisputable as to right, and reckoning as to rental or annual value by hundreds of thousands of pounds—as to value of product, by at least three or four times the rental. Perhaps it may be desirable to add, for the benefit or the placating of such persons as may be disposed to think that, in such matters, *la propriété c'est le vol*, that in England and Ireland a considerable proportion of the fisheries (in Ireland, it is said, more than a half) are not private property at all, but are as free to all comers as the fisheries for cod or ling.

Similar difficulties stand in the way of ascertaining the total amount of employment furnished by the salmon-fisheries, though here again it is comparatively

easy to get the statistics of a few localities. Thus salmon-nets employ, on the Tay, about 700 men, receiving in wages about £9000 a year, and on the Tweed, about 350 men, receiving about £4500. Even if the total value or rental were known, it would be impossible to deduce the total amount of employment, the proportion of labour to rent differing greatly according to the natural circumstances and the number of separate or competing fisheries in each river or estuary. But the question of employment may, for two reasons, be confessed as not entitled to very much weight in estimating the importance of the whole subject. It is an employment which by law—the law of nature quite as much as the law of the land—cannot extend over much more than half the year; and unfortunately, it is available only during those months in which other kinds of outdoor labour are abundant, and is suspended during those months when the other kinds also fail. Further (as shall be afterwards explained), the labour of salmon-fishing is to a great extent labour lost, an equal or greater produce being obtainable under a thoroughly reformed mode of fishing, with a mere fraction of the present toil and cost. Whilst thus admitting, however, that the question of employment is of more interest to the few thousands of men—an honest and stalwart race—who live by the dragging of nets, than to the community at large, it is still insisted that (so long, at least, as the present system of working fisheries is continued) the legal “protection” preserving their employment from extinction, is not and would not be given them at the cost of any one else, and that their loss would be nobody’s gain.

Once more, kindred difficulties present themselves in estimating the total quantity of Food supplied by the salmon-fisheries, though a glance at one or two of the ascertained facts will let us see that in this respect also the matter is worth looking after. From the Reports of the Irish Commissioners, we learn that, in 1862, apparently an ordinary year, three Irish railways conveyed 400 tons, or about 900,000 lbs. of salmon, being equal in weight and treble in value to 15,000 sheep, or 20,000 mixed sheep and lambs. In Scotland, the Tay alone furnishes about 800,000 lbs., being equal in weight and treble in value to 18,000 sheep. The weight of salmon produced by the Spey is equal to the weight of mutton annually yielded to the butcher by each of several of the smaller counties. The diminution in the supply of food caused by the decay of the Tweed fisheries, is about 200,000 lbs. a year. And in making comparisons between the supplies of fish and of flesh, it must be kept in mind that fish, or at least salmon, though higher in money value, cost nothing for their "keep," make bare no pasture, hollow out no turnips, consume no corn, but are, as Franklin expressed it, "bits of silver pulled out of the water." To the legal protection of salmon, therefore, there apply none of the arguments that are sometimes supposed to apply to cases falsely assumed as similar. When a man turns his land to the use of wild-deer, he takes away the food of a proportionate number of sheep; when to an unnatural extent he preserves pheasants, hares, and partridges, the neighbouring fields must pay for it; but a salmon displaces nothing, eats nothing, comes in nobody's way. It is largely, indeed, because

the salmon is, in a more than ordinary sense, the free gift of nature, that its importance as an article of food has been undervalued or overlooked. Minute calculations and eloquent speeches are made on such points as the diminution (if any) of the supply of food caused by turning portions of a mountainous district to the purpose of feeding deer instead of sheep or black cattle ; but the inflicting of utter barrenness upon rivers, naturally yielding every year hundreds of tons of not only nutritious but delicious food, is a procedure which has hitherto received almost no share of public attention, much less indignation. Already, it may be safely said, three-fourths of the natural supply have been lost ; a little more care, and that loss may be repaired ; a little less care, and the loss may be made complete and irreparable. Nor ought it to be forgotten that in this matter the public have a more immediate, if not a greater interest than the lessees, or perhaps even the proprietors, of fisheries. The number who desire and can afford to eat salmon as a luxury, and still more, the number that on certain occasions *must* produce the dish at table, has been and is increasing, and when an increasing or maintained demand and a diminishing supply meet each other, we find the result in aggravated prices. The greater the scarcity, the higher the price ; and in this comfortable conviction, and in the hope that the thing would last their time, the larger section of the proprietors and their lessees have been, or at least were, until the recent legislation, going on competing with each other who should kill most and spare least, careless of the future. For many years they had, as Lord Polwarth expressed

it a quarter of a century ago, been spending both interest and capital, encouraged thereto by their powers of making the public for a period pay for the extravagance. And when that period had come to an end, it would have been small consolation to the public that the salmon-proprietors (the lessees would probably have taken warning, and "got out") were the greatest sufferers; there would not less have been a heavy and wanton injury to the community, a deduction from the national wealth, a gap on the national table, and (which brings us to the next head of discourse) an obliterated chapter in the national sports.

But *is* the salmon good for Sport? There actually are people that will ask such a question, though to all but the grossly ignorant it seems to verge on the insane if not on the profane. Perhaps there may even be some who, being assured that the salmon *is* good for sport, are capable of asking next, what is *sport* good for? But to this extreme class we merely reply, that it is good for health and for amusement—at least as good for these purposes as much of the walking and riding that is done under the sun, and greatly better than most of the eating, drinking, and dancing that is done under the chandelier. We may consent to admit—for it is nothing to the purpose—that salmon-angling is actually one of the most costly, and is apparently—that is, to the eye of all but the person suffering—one of the dreariest and most desperate of recreations. The expense and the labour are great; the material recompense inappreciable, and often quite invisible. The average cost of a salmon

taken on the rod-fisheries of the Tweed (and Tweed is not an extreme case) was lately calculated as varying between £3 and £5, counting nothing for time and for travelling expenses,—the latter item, it must be understood, being proportionately very heavy, because a salmon-fisher cannot, like a grouse-shooter, remain at his station for weeks together, but is restricted to only two or three days after each flood. Yet the money is cheerfully paid, and the disappointments no less cheerfully endured. Salmon-fishing is indeed a passion, perhaps unaccountable as to its origin, but certainly irrepressible in an ever-increasing proportion of the people; while in individuals the appetite, once implanted, almost invariably grows rapidly till the end on the very little indeed that it now-a-days has to feed upon. It is strange to think of the exceeding desperateness of the chances of success which suffice to tempt men away from their business and their families to some of our salmon-streams; yet those who have most often felt and seen the hopelessness of the undertaking, are just those who are most eager to try it again. Look at that otherwise sensible and respectable person, standing midway in the gelid Tweed (it is early spring or latest autumn, the only seasons when there is now much chance), his shoulders aching, his teeth chattering, his coat-tails afloat, his basket empty. A few hours ago probably, he left a comfortable home, pressing business, waiting clients, and a dinner engagement. On arriving at his “water,” the keeper, as the tone of keepers now is, despondingly informed him that there is “nae head (shoal) o’ fish,” although at the utmost “there may be a happenin’ beast,” or, as we have heard it expressed

with that tendency to a mixture of Latinisms with the Border *patois*, which is to be ascribed, we suppose, to the influence of the parochial schools, "There's aiblins a traunsient brute." But in his eagerness and ignorance he knows better than the keeper; and there he is at it still, in his seventh hour. The wind is in his eye, the water is in his boots, but Hope, the charmer, lingers in his heart. To many this is a marvel considerably greater than that which Byron stated and explained:—

"Though sluggards deem it but an idle chase,
And marvel much that men should quit their easy-chair,
The toilsome way and long long league to trace,
Oh, there is sweetness in the mountain air,
And life that bloated ease can never hope to share."

For surely it is still more marvellous that men should quit not only their easy-chairs, but their native and proper element, in pursuit of something which they very seldom obtain, and which is to be got at home for a twentieth part of the money, and no trouble at all. Yet many there be that commit this folly and find a sufficient reward. And pray, asks the objector, what is *that*? Obviously something which unbelievers are incapable of understanding and unworthy of enjoying. It has been maintained, though not perhaps in cool print, by men of sense and sobriety—men not ignorant of any of the delights to which flesh has served itself heir—that the thrill of joy, fear, and surprise (now-a-days surprise is the predominating emotion) induced by the first *tug* of a salmon, is the most exquisite sensation of which this mortal frame is susceptible—whether he come as the summer grilse, with a flash and a splash; or like a new-run but more sober-minded adult, with a dignified and

determined dive ; or like a brown-coated old inhabitant, with a long pull and a strong pull, low down in the depths. Without discussing this point in all its aspects, moral and physiological, it is enough that for a very small chance of attaining the salmon-angler's delight, whatever it is, there are multitudes prepared to pay and suffer without asking anything whatever that is injurious to other men, or to the public weal. Nor is it to the purpose that there are moments—rather perhaps only one moment—when the angler himself may half suspect his own rationality,—the moment when, after having toiled all day and caught nothing, he turns, soaked and shivering, to the hut which is his home for the night, seeing in his mind's eye his unsympathizing wife, his unanswered letters, and especially his vacant chair at the board of the friend whose good opinion and better dinner he has recklessly forfeited. For a moment the inclination seizes him to say with Touchstone in the forest,—“ When I was at home, I was in a better place.” But it is but for a moment ; and then follows another strange effect. How is it that on or near the river-side everything he sees or tastes seems better than are better things at better places ?—bad whisky better than the best claret ; braxy mutton than the choice of Leaden-hall ; the conversation of a decidedly unintellectual keeper or boatman than the best *mots* of the best got-up diner-out ; and the repose on the pallet of chaff or straw deeper and sweeter than often visits beds of air or down ? Come how it may, come it does, that the discussions, the jokes, the incidents of times like these, the memory cherishes and gloats over through many

years, and especially through many dreary close-times, when multitudes of things, doubtless much brighter and less worthy to fade, have been forgotten, or are remembered but as wearinesses. In short, the whole affair, concludes the objector, even on your own showing, does not stand to reason—an idea which, perhaps, indignant anglers would prefer to express by saying that reason does not stand to it.

But all this, it will be said, is *ex parte*; the other side must be heard, or at least looked at;—in the form of phrase employed in *Douglas*, You speak a fisher's—hear a fish's voice. To every transaction in angling, there are two parties, one at each end of the apparatus (as Dr. Johnson said, in an unpleasant way, which may be forgiven in consideration of the man having been blind and obese, and having deliberately preferred muddling himself overnight at "The Mitre," to answering in person "the breezy call of incense-breathing morn;") and what may be sport to one of the parties is certainly death to the other. Admitted—and what then? Fish, like all the better members of the lower creation, were made to be eaten; and in order to be eaten, it is necessary (always and carefully excepting the case of oysters) that they should be previously killed. Possibly somebody may be foolish enough to say—for twaddle bears a charmed life—that killing is cruelty, to be avoided, so far as possible, as an unpleasant necessity, not to be sought after as a pleasant sport. A maudlin heresy, born of ignorance and affectation. No people in this country, or indeed in Christendom, of whatever sect, rank, or condition, are in a position to charge anglers

with cruelty, except the Vegetarians ; and not even they, for in munching their blades, they destroy myriads of peculiarly innocent and harmless creatures, existing or prospective : you take their life very effectually when you do take the means whereby they live—and their life besides. Just let the young lady who is shocked at the cruelty of angling tell us on what she has been dining. Is it not *lamb*, the flesh of the animal which all the poets, over whom she has such pleasure in sighing, have chosen as the very emblem of innocence and helplessness ? “ Yes, but *I* did not kill it ; I sought no pleasure in the poor thing’s death.” We join issue with you here, and insist that wherever there is any difference between you, the lamb-eater, and us, the fish-slayers, it is all in our favour. To get that joint of lamb, you *hired* a coarse and greasy butcher, who, with “ unkind clutches” in its fleece, roughly seized the little bleater, tied its feet with cruel cords—those feet, you know, that gambolled on the hill and frisked over the mead, and so forth—dashed it roughly on a stool, and thrust a jagged knife through its innocent throat. “ Shocking !” Very ; and all your doing, Miss ; that is, though you pretend not to know the history of a leg of lamb, done for your delectation, and in fulfilment of your orders—“ Here comes the body of Cæsar, mourned by Mark Antony, who, though he had no hand in his death, shall receive the benefit of his dying.” In virtue of the prerogative given men over the fish of the flood—in obedience to that instinct to hunt and slay, implanted in all the sons of Adam, and, as the chaplain in “ Jonathan Wild” justly remarked of punch, “ nowhere spoken against in Scrip-

ture"—we quit the easy-chair in which you loll whilst your lamb is writhing in the shambles, traverse hill and dale, plunge into the stream, and set our instinct against the instinct of the intended prey—our ingenuity against his cunning—our patience against his shyness; in short, give him fair play, letting him pit all his powers of escape against our powers of capture. And we select for our purposes those fish that are most scarce and most difficult to snare, unlike you, who select the kinds of animals that cover a thousand hills, and that nature has left helpless.

Again; while your lamb, when seized, was harmlessly and helplessly "cropping the flowery food," what was our fish doing when snared? Seeking to compass the death of a pretty and innocent insect; and doing so, there is reason to believe, from a motive very similar to that which led us to compass *his* death—more for sport than for victuals. He was caught in the act. As much right as he had to come into our element in cruel pursuit of our fellow earth-born, had we to go into his. A brother of the trade has only done for him what he has done for myriads—and what he would have done for hundreds or even thousands more before nightfall of the very day on which we took him into custody. It is a trade established by nature, doubtless for wise, nay, obviously for necessary purposes. The small are fed on by the great, and these again by the greater still, in unbroken succession and perfect harmony through all creation, "the diapason closing full in man;" except, indeed, in those exceptional and objectionable cases where a lion or tiger mars the harmony by adding another note.

But then "the mode is cruel." Denied, whether as compared with the usual modes of killing fowls and quadrupeds, or with the wholesale or trade modes of capturing most kinds of fish. Keep in mind that all animals do not feel as men feel, nor all animals alike, and that fish are pretty nearly at the bottom of the scale ; in brief, that Shakspeare's dogma about the equal corporal sufferance of giants and beetles, and all such fine sayings, may be sentimentally pretty, but are scientifically nonsensical. On the other hand, take the case of fish killed in the way of trade and not of sport. No young lady ever thinks of bringing against the fishermen of Newhaven, Cullercotes, or Cowes, the charges of cruelty she so savagely levels against her own brothers or male friends, who are fishers ; but the cod or haddock on which she regaled, before beginning the lamb (we lay out of sight, for the moment, the possibility of her having swallowed a few live oysters), suffered more than ever did trout or salmon snared by angler, having probably been caught on the fisherman's set line at twilight, and been kept hanging there till morning. But (and now we come to the last and lowest of sentimental refuges) why not kill your trout and salmon by net ? Partly, because that mode would be more destructive and merciless than the hook and line, and partly for the same reason that the sea-fisherman does not take his cod and haddock by net—because it cannot be done. Let us be logical. Either the fish killed by anglers could be killed by net, or they could not. In some cases they could ; but in such cases the use of the net would kill in greater numbers—would, in fact, extirpate,

cutting off every fish in early youth. Would that be more humane? Is the death of a few, by a somewhat less painless process, not more kind than the destruction of a great multitude or of all; more in accordance with the great principle which reason and philosophy sanction—"the greatest happiness of the greatest number?" In some other cases, perhaps the majority, the fish caught by angling are not to be caught by net—the so-called more humane mode. And here let it be noted also, that killing by net is not, generally speaking, more humane than hook and line. Even with the sweep-net, a fish, in a moderate-sized river, is as long in being brought ashore as a moderate-sized fish usually is with good angling tackle; while in all the other kinds of net, he undergoes, literally, the process of being hanged by the neck during several hours. But, passing from that, we have proved, first, that fish were made to be killed; second, that ours is often the only and generally the most humane mode of killing them. It was suggested by Macaulay, and by somebody else long before him, that the objection of the Puritans to the practice of bear-baiting was founded rather on the pleasure derived by the spectators than the pain accruing to the bear; for the reasons above imperfectly stated, we venture to suggest that some people may object to fishing more for the delight it yields to the fisher than for the annoyance it may incidentally inflict upon the fish.

It is of no use to argue that there must be something more than annoyance, seeing that a hooked fish resists, and, by inference, suffers. To say nothing of the fact that a fish resists quite as violently when he finds his

whole body in a net as when he finds a hook in his mouth, the mere fact of resistance is no relevant proof of suffering, and no adequate reason for compassion. The resistance very probably proceeds from a mere impatience of restraint, a love of liberty, which should inspire, not pity, but respect and brotherly sympathy, tending to draw him and us more closely together.

Finally, anglers, besides only killing fish in one way that would otherwise require to be killed in another, reduce the amount of killing in some other department, and even in the fish department, and in the aggregate. When people eat fish, they eat so much less flesh and fowl. Therefore the proper way of calculating the results of an angler's dealings with the animal creation is to reckon, not merely the number of fish whose lives he may have taken, but rather the number of fowls, lambs, sheep, and oxen whose lives have, by his labours, been preserved. Then arithmetic would fail to compute the amount of insect life of which the angler is the preserver as well as the avenger ; a small fish will take in a single day more lives than a great angler will take in a whole season. Further, compare the neatness and even agreeableness of the angler's mode of operation with the hideousness and brutality of those operations from the performance of which he has, to so large an extent, exempted the butcher and the poulterer—the exhilarating struggle and friendly knock on the head by the pleasant river-side, with the felling, throat-cutting, and neck-wringing of the slaughter-house and the pen—and it becomes clear, to all but those blind with an unwillingness to see, that the ways of the

angler are almost as much ways of mercy, as of peace and pleasantness.

Sufficient refutation, indeed, of the charge of cruelty might have been found merely in an enumeration of the peculiarly amiable as well as eminent men who have both praised and practised the truly gentle art. Without going the length of saying that all good men are anglers, we may say that most anglers are good men, and that angling has a tendency to make men good. It soothes and elevates, and leads to meditation and self-scrutiny. Many a man who, in the stir and pressure of active life, becomes hardened to the gentler and more generous emotions, obtains glimpses that make him less forlorn or more divine, when wandering "the quiet waters by." The true influence of the art is seen in its literature. A gentle and a generous man was Izaak Walton, the father of angling literature—it had a *mother* long before in Dame Julyana Berners, the prioress of St. Albans. The same may be said of almost every man who has contributed to the subject, by no means excepting those of our own day—the Wilsons, Jesse, Scrope, Stoddart, Stephen Oliver, and many more. But this is not the strongest part of the case. While many good men have written whole books in praise of the art, how few, either good, bad, or indifferent, have dared to say a word in its dispraise! Of course, there was Lord Byron, who calls our old Izaak a "cruel coxcomb," and actually *prays*—a thing which he was "baith dede sweert and wretched ill o'"—that strength might be granted to the "poor little trout" to pull *in* the said Izaak and all others who might try to pull it *out*. But the real truth is, that angling was far

too pure and gentle a pastime for Lara ; and it would be vain to reason with those who would take *his* authority, whatever use or warning there may be in his example, either as to what is cruel or what is coxcombical. Then of course there is, as already mentioned, Dr. Johnson with his sounding and senseless apophthegm (as he doubtless called it) about “a stick and a string.” But he has utterly ruined his character as a witness by having committed himself to the opinion that “the throne of human felicity is a tavern chair.” Who can doubt that the learned sage would, as a writer, have been much more natural and less made-up—much more of an Englishman and less of an imitation Roman—had he devoted to wandering on rivers’ banks some of the time he employed in sitting upon his throne of human felicity,—had he listened more to the tongues that are in trees, and oftener read the books that are in running brooks ?

But leaving the many good men who have written books expressly and solely in praise of the gentle art, and the one or two questionable persons who have ventured a remark on the other side of the dispute, look at what a mass of testimony we have in the frequent and fond *allusions* of almost all our British poets. With the already disposed-of exception of Byron, not one English poet has one disrespectful allusion to the art ; while passages might be cited from almost all of them showing that they loved, understood, and practised it. To begin pretty near the beginning, Spenser draws so many comparisons and illustrations from the subject as to show that, notwithstanding his poverty, his courtiership, and his official and poetical labours, he had loitered by many

pleasant water-sides. Thus, in telling that Archimago could not catch the Red-Cross Knight by any of the devices that had once been successful, he expresses himself—

“The fish that once was caught new bayt will hardly byte,”—

which is a piscatorial fact, not perhaps requiring much profound knowledge of the art, but still not likely to suggest itself to any but an angler. It is also another evidence in favour of Spenser being one of the initiated, that when he has occasion to mention any river, he frequently and needlessly stops to catalogue the kind of fish to be found in it,—the knowledge he is so fond of displaying on this point ranging over a great part of Ireland, as well as England. Coming next to Shakspeare, we confess at once that there is no evidence now extant of his having been in the habit of taking a day's sport in the Avon or anywhere else ; but whoever reads any of those heavy yet unsubstantial books called Lives of Shakspeare, will find that information is missing about many other things besides this that yet the Bard *must* have done. There are, however, many allusions to angling scattered throughout Shakspeare, several of them, we admit, showing no profound knowledge of the subject. Thus Ursula, in *Much Ado about Nothing*—

“The pleasantest angling is to see the fish
Cut with her golden oars the silver stream,
And greedily devour the treacherous bait.”

In the present day, this, so far from being “pleasant,” is not possible angling, for if you see the fish, the fish sees you, and that's an end of it ; but some allowance may be made for the fact that this was written in an age when British fish were in a comparatively primitive

state of mind, and when man had not yet found out so many inventions for their destruction. Pope, as appears both from his poems and the testimony of contemporaries, was an angler, but only, we fear, a pond and perch man—speaking enthusiastically of “eyeing the dancing cork and bending reed.” He evidently, however, knew well the technicalities and nomenclature of the art, and in his poem of “Windsor Forest” will be found the original of the descriptive catalogue of fish which Smollet has plagiarized in his “Ode to Leven Water.” Dryden also was an angler, and his contemporary Tom Durfey too, and were jealous of each other on that as well as other accounts, as we learn from Fenton :—

“By long experience Durfey may, no doubt,
 Ensnare a gudgeon or sometimes a trout ;
 Yet Dryden once exclaimed in partial spite,—
 ‘*He fish!*’ because the man attempts to write.”

To name only one more among the poets of that era, Johnny Gay more than once makes a virtue of confessing himself an angler, and describes the process of securing a “thumper,” in a long and not very successful, but eminently practical passage. Among poets of the present generation, we name only the least likely of them all, Wordsworth, whose lines descriptive of trout lying on a blue slate would have shown him not destitute of all taste and knowledge regarding this subject, even if we had not Sir Humphry Davy’s positive testimony that the poet of the Lakes was “a lover both of fly-fishing and fly-fishermen.”

What other sport, we may now ask, is consecrated by having been the subject of so much poetry and the delight of so many poets? None. Hunting—

at least the thing called hunting in modern times—has been left to some nameless song-writers, and to poet Somerville and such small deer. Shooting is absolutely and entirely without a literature. Both are modern and prosaic. Angling alone is ancient and poetical, and has been practised, and its praises sung, in all countries and generations.

Then, passing from poets and poetry, look at the number and strange variety of the men whom angling is known to have had and to have among its most devoted followers,—great warriors, fierce politicians, and deep philosophers. Mighty Nelson was almost as expert and enthusiastic in fishing as in fighting; and the constancy of his affection for the art is testified by his pathetic remark to a boatswain who had lost his arm at the same time as himself, “Jack, we’re spoilt for fly-fishing,” and by his afterwards resuming the prosecution of the sport with his left hand. Everybody knows how Paley, when asked by his bishop what progress he was making with his last great work, explained that he would apply himself steadily to the subject of Natural Theology as soon as the fly-fishing season was quite over, but certainly not sooner. Of Sir Humphry Davy’s ardour there is no need to speak; not even how it once led him to the water-side in the north of Ireland on a Sunday, where, says the philosopher, “a man came up, exceedingly drunk, began to abuse me by various indecent terms, such as a Sabbath-breaking Papist,” and carried off his rod, “with imprecations;” nor how, when he went in quest of health and fish to other lands, he cursed “the blue rushing of the arrowy Rhone,” in which he could scarcely get a “rise”

for want of a "drumme." Then, to come to another class of men, the late Henry Hunt was one of the best fly-fishers in England, not grudging, in pursuit of the art, to abandon the glories of demagogism and the profits of blacking-making. Thomas Doubleday, too, a dramatic poet of genuine power, and an ingenious writer on various subjects, who led the fierce democracy of the English coal districts during the Reform struggle, is so devoted a Waltonian that he has, it is said, been known to address the once dread Northern Union at Newcastle, with the flies round his hat, and the air of Coquetdale still fragrant about him. It ought here, however, to be remarked, that, generally speaking, anglers are not fierce politicians, but men of quiet and peaceable lives, seeking solace under wrongs and oppressions in the eminently practical philosophy which Cotton indited and Walton endorsed :—

"We scratch not our pates,
 Nor repine at the rates
 Our superiors impose on our living ;
 But do frankly submit,
 Knowing they have more wit
 In demanding than we have in giving."

Women, too, have been slaves to this fascination, both in ancient days and in these. Cleopatra, for instance (but not as instance of an amiable or even respectable woman), kept her punt on the Cydnus,—"Give me mine angle : we'll to the river ;" but, like other women, she had a way of her own, and behaved in a most unsportswomanlike manner in her angling competition with Antony, "when her diver did hang a salt-fish on his hook, which he with fervency drew up." But why go to other times or to eminent

names? Almost every man knows among his own acquaintances, and especially among the best of them, of cases in which the love of angling has become, not only the one recreation, but the absorbing passion of life. A man is in our mind's eye who could see nothing enticing in Milton's description of the celestial abodes, except where it is said that

"The river of bliss through midst of heaven
Rolls o'er Elysian flowers her amber stream."

On the other hand, we have heard of a person who was wont to derive consolation from the item of foreign intelligence given by Shakspeare, "Nero is an angler in the lake of darkness," and who fondly imagined he had got a "wrinkle" as to the best bait for the river Styx. This gentleman, however, was afterwards brought to better behaviour and more cheerful views. And indeed the cases in which anglers are ever otherwise than good and cheerful men must evidently be exceptional. To say otherwise is not only to collide with facts, but to utter profanity against Nature—to assume that love of her is compatible and connected with love of cruelty and other evil things—that there is no virtue in "the impulse from a vernal wood,"—no teaching of love or gentleness in fragrant fields and cooling waters.

CHAPTER II.

NATURAL HISTORY OF THE SALMON.

The Parr—Period of Emigration—Period of Immigration—What's a Grilse?—Natural Waste of Salmon Life—What are "Spring Salmon?"—"Fish of the Salmon kind."

THE natural history of the Salmon is not only interesting in itself—interesting for what is known and settled, for what is guessed and controverted, and for what remains as utter mystery and dire perplexity,—but is also important as having a bearing upon, or rather forming an essential part of, the commercial and legislative questions. Without some knowledge of how, when, and where the fish breeds, dwells, and feeds, it is useless to speak and unsafe to act. The amount, however, of positive knowledge, the number of undisputed facts, attainable by inquirers, will not be denied (except by those who know very little) to be small, in comparison with the amount of conjecture and the number of dogmas. The obvious natural difficulties of the question have been greatly aggravated by dogmatism, and, till within about thirty years, have scarcely been assailed by experiment. There is indeed almost no subject on which it is easier to dogmatize than the natural history of almost all kinds of fish, of which so much is unascertained and probably unascertainable,

that questions discussed by Aristotle are unsettled yet; and the salmon, exciting more curiosity than any other inhabitant of the water, has been more than any other the object of visionary theories, narrow empiricism, stiff assertions, easy credulity, and obstinate unbelief—nay, several questions relating to the salmon have been discussed with as fierce an intolerance, as resolute a contempt for facts and reason, as much heat and as little profit, as if they had been questions in theology. A favourable field for all this was afforded by the natural difficulties in the way of investigation, or at least of ascertainment. The fish can be but obscurely and occasionally observed by man during one-half of the year, and during the other is not only invisible as to its habits, but is quite unknown as to its residence—after the salmon has left the rivers, we are ignorant not only of what he is doing, but of where he has gone. Difficulties like these are to certain classes of people facilities. Sciolism plunges in where science is perplexed, and “practical men,” with their few half-facts gathered from a merely local experience, are full of that certainty which is exorcised from the inquirer in proportion as he extends and deepens his investigations. The nonsense about the salmon that has been published under the name of natural history, and thrust down the throats of Parliamentary Committees, is, when looked back upon, appalling in amount, variety, and worthlessness. To read some people’s deliverances on the subject, they might seem to have collected their materials during a lengthened subaqueous residence, and to have come back speaking with a more than earthly authority. If,

indeed, a deputation of those omniscient authors and witnesses could be induced to stay below water for a few months, going down, say in November, taking their seat where they could observe the deposition and development of the ova,—“sitting under the glassy, cool, translucent wave,”—accompanying their charge to the sea, and returning to their native element in autumn, saturated with information, they would then, but not till then, be competent to speak with the authority some of them have assumed. There are, of course, difficulties in the way of such a commission of inquiry ; but, looking at the uselessness, and often mischievousness, of the magisterial manner in which many people handle the question, one is almost tempted to say, there would be no harm in trying. In questions regarding the natural history of the salmon, it will almost always be found, except with regard to one or two points settled by adequate experiment, that those people who have seen most are inclined to say least, and that those who have thought most are most at a loss what to think.

The chief questions are, or have been, four in number :—1st, Is the Parr the young of the Salmon in earliest infancy ? 2d, At what age does the Smolt emigrate to salt water ? 3d, After what length of absence does the emigrant return to fresh water ? 4th, In what shape does he return, “Grilse” or Salmon ?

It has happened, not unluckily, but rather superfluously, that the most decisive experiments in the natural history of the salmon have been directed to that point which was most capable of settlement by

ordinary observation. That the parr is the infant young of the salmon was a fact so clear, or a conclusion so inevitable, before the experiments were made, that it would now be hard to conceive how it could ever have been in doubt, were it not that, even after the experiments have furnished the most ample demonstration, there are still to be found a considerable number of people who, instead of having been convinced, have only been enraged. A good deal, however, of the former, and almost all of the remaining confusion, arises from differences in names and mistakes as to identity—the parr being known by many different names in different localities, and some of these names being in some districts and by some people applied to such river trouts as happen, which is a frequent case, to bear marks resembling one of the distinctive marks of the parr. Even two hundred years ago (when such matters received but scant attention), this confusion of names was matter of observation and complaint. We find it alluded to in a curious, though, by reason of its pedantry and priggishness, rather unreadable book, by “Richard Franck, Philanthropus,” a Cromwellian trooper, who made an angling tour through a great part of Scotland about the middle of the seventeenth century, and published his experiences under the title of *Northern Memoirs*, without obtaining almost any attention till 1821, when the volume was reprinted with a preface and notes by Sir Walter Scott. Speaking of “the various names given in England to the *brood* of salmon,” he says:—“Now, in the South, they call him samlet, but if you step to the West, he is better known there by the name

of skegger ; when in the East they avow him penk ; but to northward, brood and lockesper ; so from thence to a tecon ; then to a salmon." About the same period, Izaak Walton enumerates the names of samlet, skegger, and tecon as names of the young of the salmon, imagining them, however, to be the young of three different species of salmon ; and he tells us that he knew (by hearsay) of experiments on this point made before his day, not dissimilar in mode, object, and results to some that have been made in our own. Thus : " It is said, that after he is got into the sea, he becomes from a samlet, not so big as a gudgeon, to be a salmon, in so short a time as a gosling becomes to be a goose. Much of this has been observed by tying a ribbon or some known tape or thread in the tail of some young salmons which have been taken in weirs as they have swimmèd towards the salt water, and then by taking a part of them again with the known mark at the same place at their return from the sea, which is usually about six months after." Again, a hundred years later, we have Captain Burt (an English engineer officer, who resided in the Highlands between the two Jacobite Rebellions, and wrote a book still of great value and interest), when referring to the river Ness, speaking thus :—" There is great plenty of a small fish the people call a little trout, but of another species, and is exceeding good, called in the north of England a branlin. Then they are so like the salmon frye, that they are hardly to be distinguished, only the skals come off the frye in handling, the others have none." Burt failed to see that the branlin and the " frye" are the same fish in different stages, and to note

the fact that no fish are born with a silver scale or migratory dress, but assume it only a short time before they go seaward. The English Fisheries' Act of 1861 includes all the names above given as local names for the young of the salmon, except "lockspers" and "tecon," mentions many more names, and comprehends besides "all local names," anywhere in use, though not specified in the Act. Such difficulties, however, as arose from this confusion of nomenclature would have been easily enough got over if the controversialists had really been seeking for truth instead of contending for victory, and had been willing to believe what any observant man could plainly see.

About ten years before what were really the first decisive experiments, Mr. Scrope (*Days and Nights of Salmon Fishing*) wrote a long letter to the Right Hon. T. F. Kennedy, M.P., who had then a Bill relating to the salmon-fisheries before the House of Commons, in which the theory, or rather fact, that the parr is the young of the salmon, was stated with positiveness, and argued with great clearness and force. Mr. Scrope, of course, could only proceed upon the facts he had observed in the rivers—but these ought to have been enough—such as the absence of parrs from all but salmon rivers, the disappearance of the larger parrs after May, and the finding, in spring, of the distinctive marks of the parr under the silver scales of the smolt. Sir David Brewster, also, having made an examination at the request of Mr. Scrope, gave his testimony that the eye of the parr has a formation precisely the same as that of the salmon, and quite different from that of the

trout. About eight years later, and still previous to the decisive experiments, James Hogg, the Ettrick Shepherd, gave the world some very good reasons of his own for holding the parr to be the young of the salmon,—reasons founded on observation and experience, partly on his having observed the gradual assumption of the migratory dress by the parr in the spring months, partly on his having caught as grilse fish which he had marked when parr, or when in their transition-state from parr to smolt. This, however, had little effect, beyond raising a crop of jokes about the license of poets in general, and of poet Hogg in particular. The fact is, that the brothers of the angle, especially the elder brethren, though the best of men, are rather addicted to stiffness in opinion as to things connected with the art. Almost every man had, till within these few years, his own theory as to the salmon and the parr, which stood well enough, in so far as it was no more unnatural and irrational than any of the half-dozen theories of the half-dozen neighbours with whom he had debated; and which he probably clung to all the closer that it was purely and strictly his *own*, having no source in search, experiment, or even what could be fairly called observation. Amidst all these self-satisfied, and only self-satisfied theorists, Mr. Shaw—head-keeper to the Duke of Buccleuch at Drumlanrig Castle—appeared, in 1836, with his measurements, his plates, and his dates, the result of careful and repeated experiments—and almost instantly the whole tribe turned on him as a common enemy. Even had there been no proof by experiment, it would have given a most unfavourable idea of the amount of candour, or perviousness to conviction,

existing among those who, whether from a popular or a scientific point of view, have debated this question, to find that the denial of the parr being the young of the salmon was maintained for so many years in the face of these among other facts—that where there are no salmon there are no parr, and *vice versa* ; that where the salmon are artificially debarred from a river which they have been accustomed to ascend, the parr disappear along with them ; that the young of the salmon at the time when they are the size of parr, are otherwise unaccounted for ; and that parr, besides not growing *as* parr, are never seen to breed, nor are found with developed roe. We defy any man to find a parr in a river to which salmon have not access, or a salmon in a river where there are no parrs ; and we could, of our own knowledge, name a score of waters where parrs abound up to some obstruction, natural or artificial, impassable by salmon, and are quite unknown above it ; and also several where parrs used to be plentiful, but where, since the construction of insurmountable dams, they have disappeared. All this is notorious, and was known as a popular and established fact even to Izaak Walton, who, though he knew little about salmon, knew that he had never met with parrs save in salmon-rivers. The fact at least proves, that in some way a communication with the sea is necessary to the existence of the parr ; and, if it is a distinct species, how comes it that no one ever saw, or ever said he saw, parrs, as parrs, emigrating or immigrating ? But Mr. Young of Invershin, Sutherlandshire (who has some disciples) seems to attempt to stifle this difficulty by speaking of the parr as a “ river-trout,”

meaning, we presume, a trout that has no connexion with the sea, although, by a universal "coincidence," it does not live anywhere without that connexion. Even here, however, another difficulty greater than the other rises before him. Did he ever see two parrs spawning? Did he ever see a female parr with a developed roe? He never did, and never will. He may see indeed, among the endless varieties of hues and marks exhibited by common or fresh-water trouts, some trouts having mottles or finger-marks resembling those upon the parr, and exercising all the functions of adult fish, but for all that a mottled trout is no more a parr than a spotted salmon is a trout. Fortunately, however, this point, unlike some others in the natural history of the salmon, not only admits of demonstration by seeing and handling, but has been demonstrated long ago, and over and over again.

About thirty years ago, Mr. Shaw transferred some parrs from the river Nith to a pond that he had prepared for the purpose; and after a certain period they assumed the migratory dress and movements—in other words, became transformed or transcoloured into salmon smolts. Here it was proved that the parr is the infant of the salmon, unless indeed it was to be denied that smolts are the youth of the salmon, in due time becoming salmon themselves. Next, Mr. Shaw, watching till a pair of salmon had deposited their ova in a stream of the Nith, transferred the ova to an artificial stream connected with his pond; and after a time the eggs were hatched, and the produce was parrs. Here it was proved that the salmon is the parent of the parr, just as com-

pletely as it can be proved that cocks and hens are the parents of chickens. The case was thus proved from both ends—the parr was shown to be the salmon in infancy, and the salmon to be the parr in maturity. However, to make this double assurance trebly sure, Mr. Shaw caught in the river two salmon about to spawn, and having expressed their spawn within his own watery precincts, the result again in due time was parrs. Twenty years afterwards, similar experiments, on a larger scale, and with the same results, were made at the experimental and breeding ponds, Stormontfield, on the Tay, where parrs, and nothing but parrs, were hatched from the ova of salmon by hundreds of thousands ; and those experiments have been repeated at the same place with the same results in every one of the last ten years. No man has ever shown that anything else is ever produced from salmon-ova but parrs, nor that parrs are ever produced from anything else but salmon-ova, and until this is at least pretended to be done, no more is needed to be said.

The question as to the age at which the young fish emerges from the parr stage, and assumes the appearance and habits of the smolt, has been disputed more rationally ; and though it has also been made the subject of experiment, cannot yet be regarded as quite decided—or if so, the decision, according to our view, is to the effect that the disputants on both sides are about equally wrong and equally right. Let us trace the growth of the young fish *ab ovo* as far as it was made visible by the experiments of the seasons 1853-54 (which have not been found to differ from other seasons), in the Stor-

montfield ponds. Ova were deposited on the 23d of November ; by the end of March the fish began to issue from the eggs ; and that process was entirely completed before the end of May—the hatching thus appearing to require from about 90 to 130 days, a result agreeing with that arrived at by Mr. Shaw ; but the length of this period may be regarded as depending very much on various circumstances, especially the temperature of the water, as varying with each season and with the month in which the ova happened to be deposited. There is agreement this far, and also this much further, that the fish hatched, say in March, remain in the river (though, partly from minuteness, partly from shyness, rarely visible before July) until April or May of the following year—that is, till from between thirteen and fifteen months after they have left the egg. It is here that the question arises, Does the parr assume the migratory dress and movements then, or a year afterwards ; *i. e.*, at the age of about one year and two months, or at the age of about two years and two months ? The doubt on this point, oddly enough, was incidentally raised, though it was also claimed to have been settled, by Mr. Shaw. When he began his experiments, he had in view only the question as to the identity of the parr and the young of the salmon, and would appear to have had no doubt that the young of the salmon descended to the sea in the spring of the year following that in which they had been born ; and the facts apparently to the contrary, and also another and now apparently undisputed discovery, regarding the apparently premature sexual maturity of male parrs, came upon him, so to speak, by accident and

surprise. He found that the parr in his ponds remained unchanged and stationary during the second year of their existence, but assumed the migratory dress after entering on their third year; and that in its second winter, being then in its eighteenth or twentieth month, the male parr (alone) arrives at sexual maturity, and does, or can, impregnate the ova of the adult female salmon. It will be seen at once that there were two points here almost inviting attack—that as to the young of the salmon remaining *two* years before migration, and that as to the precocious and anomalous development of the young male. But because there was in both cases an *apparent* anomaly, were we bound to conclude, as many people did, and even do, that there was an actual error? On the contrary, we were bound to give Mr. Shaw's statements and reasonings the more respectful consideration when we found that he had as it were endangered the reception of the great truth which his experiments settled—that the parr is the young of the salmon—by adding two startling statements on other points, simply because they had been evolved in the course of his inquiries. It shows at least that he entered on and conducted his experiments, not to maintain a theory, but to discover the truth.

It may simplify the discussion, to dispose at once and in a few words of the subordinate or incidental question of the impregnation of the ova of the female adult salmon by the milt of the male parr. Of course there is an apparent anomaly in the system thus alleged to exist in the salmon race, of marriage between couples where the husband measures only about as many inches as the wife

measures feet. But one part, at least, of the apparent anomaly is on all hands admitted to be fact—every observant angler knows, and the chief challengers of Mr. Shaw's conclusion do not deny, that male parrs do and that female parrs do not attain to sexual maturity. This being got over, there is little difficulty in believing what remains—on the contrary, the sexual maturity of the young male must be regarded as conferred by nature for a purpose and not as a freak. That purpose Mr. Shaw maintained to be the impregnation of the roe of the female salmon, and he maintained it, not because he had dreamed or preconceived it, but because, when looking for something else, he had seen it. And often since his time, what he saw doing in the river, and what he afterwards did in his preserves, has been done with unquestioned results in the experimental streams and ponds—the roe of the adult female salmon, suffused with the milt of the male parr, generated, just as if suffused with the milt of the male adult salmon; and the roe of female salmon, suffused with the milt of any other fish, or left unsuffused as it came from the female, did not generate—so that there is both proof positive and proof negative.

Coming to the more important and more controverted question, whether the parr migrates at the beginning of its second or of its third year, the apparent anomaly of the theory that it does not descend either in the first migratory season after its birth nor in the next again, is in great part, if not entirely removed by a more or less fatal admission of those by whom the theory is disputed. Formerly, a pretty prevalent creed was that the parr

migrated in its *first* year; but that is now quite exploded. Almost all the writers against Mr. Shaw maintain that the migration takes place at the commencement of the *second* year; that is, that being hatched in March or April, the parr descends to the sea in May *twelvemonth*. It is thus admitted that it does not avail itself of the *first season of migration* occurring after it has been left to its own resources and instincts. Now, is not this as much of what we, in our ignorance of the natural history of fish, regard as an anomaly, as is the staying over a *second* season of migration? The question, then, must be considered without any regard to apparent anomalies, and decided only on the evidence of experiment and observation.

Apart from the experiments that have been made under circumstances permitting the closest observation, there is a fact observable in all salmon rivers, which, if it does not fully establish, remarkably coincides with the two years' theory. In the months of May, June, and July, full-sized parrs are to be got in the rivers, but in numbers much smaller than in either the preceding or the following months of the year. This, it will be seen, fits in exactly to the two years' hypothesis, which says that multitudes of the fish hatched two years before, and which were parrs in March and April, descend in May as smolts, and that the fish which were hatched that same year remain till autumn of diminutive size and retiring habits,—so that the parrs seen in the rivers in the months of May, June, and July, are mainly those only of the previous year's hatching, *i.e.*, of from thirteen to sixteen months of age—those of a year older than that having

just descended, and those a year younger having not generally begun to feed at large and show themselves to the angler or investigator. Unless the one-year party are prepared to maintain that the young fish attain to something like full parr size, and move about freely in search of food, within a few weeks of their birth, it would be hard for them to account for the fact that parrs are seen in the rivers in considerable quantity during the summer months, after the brood of the former year have, according to the one-year theory, gone down to the sea. Nevertheless, all this, if forming a strong presumption against the one-year theory, is not conclusive in favour of the two-years' theory; for the facts are reconcilable also, and even more completely, with what may be called the half-and-half or mixed theory, which the weight of the evidence derived from experiments goes directly to support.

One or two of the facts yielded by Mr. Shaw's experiments, and cited (not by himself) as evidence on this point, seem to us defective—those, for instance, in which parrs transferred from the river to the ponds in July put on a migratory dress the next April, for there were no certain means of knowing what was the age of the fish when transferred. The evidence, which equally satisfied and surprised Mr. Shaw, and which alone is admissible, was drawn from the case of the fish hatched in his own preserve, and kept under his own eye, from their birth till their migration. The fish which came out of the ova at Drumlanrig, in the spring of 1837, did not assume the migratory dress, and seek to depart in May 1838, as Mr. Shaw had expected, but did so in May

1839. That was a fact, *the fact* ; and the same result was arrived at by experiments made in 1859 by Mr. Ramsbottom, at Doohulla, in Galway. It was the fact, but the question remained, Was it the only fact, and irreconcilable with other facts ascertained or supposable? A great deal of argument was brought at the time against the result which Mr. Shaw appeared to have evolved ; but for a long time the argument was based only on probabilities and analogies, and not on actual knowledge. There was, indeed, a sort of exception in the case of Mr. Andrew Young of Invershin, who conducted similar experiments, leading him, as he rather too eagerly and positively declared, to the conclusion, that the parrs descend shortly after the expiry of the first year. Mr. Young's evidence, however, was to a great extent vitiated by two causes. He failed to give an adequate account of the conditions under which his experiments were carried on,—the construction of the ponds, the care taken to prevent the mixing of broods, the constancy of the watch kept over the growth ; in short, he omitted everything that rendered Mr. Shaw's contributions to the question valuable and interesting. On one side, therefore, we have the evidence of an experimenter who told us minutely all he had done ; and on the other, the evidence of an experimenter who declined to tell anything but that he had made experiments. Further, Mr. Young had, rather oddly and unluckily, told the Royal Society of Edinburgh, in 1843, that he “entirely agreed” with Mr. Shaw ; whilst the experiments on which he founded his subsequently expressed entire disagreement with Mr. Shaw, were made in 1841. However, the

point might have been regarded as still open to dispute, and it was, by a sort of common though tacit assent, laid over for decision by the larger and completer experiments carried on at Stormontfield.

To the surprise if not the discomfiture of both parties, Stormontfield decided both ways, or neither way. The ova deposited in the end of 1853, were hatched in the spring of 1854, and the produce continued in the pond as parrs during the summer of that year. May 1855 was the time at which the movements of the young fish must decide the question. If Young was right in saying one year, they would then go off; if Shaw was right in saying two years, they would still remain. The result was perplexing: *one-half*, as nearly as could be estimated, went off at one year old, and the other half at two years (*i.e.*, in May 1856). Here, besides both parties having been proved wrong and both right, was another apparent anomaly: those people who had been arguing or admitting that there was something anomalous in the fish remaining two years before emigration, were shown something much more anomalous in the fish going off in two apparently pretty equal divisions at ages differing by a year. When it thus seemed so far ascertained that only half the fish migrated, a new hypothesis was brought out, to the effect that the females descend the first year and the males the second. This suggestion was not only supported by some curious facts drawn from experience on the river Wharfe, in Yorkshire, but it also "fitted in" to the fact, as already mentioned, found by Mr. Shaw in his experiments, besides agreeing with the observations of intelligent

anglers, and propounded so far back as 1686 (*De Historia Piscium*, by Rae and Willoughby), that the male of the young salmon comes to sexual maturity in its parr state. The hypothesis, however, was crushed by its appearing on investigation that the fish remaining during the second year consisted of both males and females, the milts of the males being fully developed, while the roe of the females was discernible only by a microscope. Thus in the end (for it seems the end), the disputants on this point have been left all in the wrong, or all in the right, and consequently a large proportion of them on both sides not only disappointed, but unconvinced.

To account for the double or mixed response of the Stormontfield oracle to the question between the one-year and the two-year theories, doubts have been raised by the partisans of both views, whether the circumstances under which the fish were reared in and let out of the pond, were not such as to render the results unreliable as indications of what would have taken place had the fish been in their natural position and freedom,—one side, of course, maintaining that these circumstances accelerated, and the other that they retarded, the natural growth and movements. It was said of Mr. Shaw's experiments that the two-years' fresh-water residence of the fry was ascribable to the "difference of temperature between the waters of the Nith, from which the ova were taken, and the waters of the ponds in which they were hatched and reared." But where is the evidence as to what was the difference in temperature, or whether there was any at all? On inspecting Mr. Shaw's *Observations* for information on this point, we can only find that the tem-

perature of the ponds, as compared with that of the river, was on one occasion three degrees below, and on another six degrees above. So whatever difference there was, seems to have been in favour of the pond stimulating, not retarding, as compared with the river or natural habitat. But suppose it were otherwise, what then? We know that a lower temperature might retard the hatching of the fry by a week or two, or their growth by half an inch or half an ounce; but we have no ground for supposing that it would retard for a whole year such a change as that of assuming the migratory dress—taking place, as that does, at a fixed season of each year—especially as the fact of that change not being dependent on size, development, or condition, is evidenced by the great difference in all these respects observable among the descending smolts. Again, on the one hand, it has been argued that the young fish at Stormontfield were probably not sufficiently fed, else they might *all* have arrived at the migratory stage the first year; but it is also said, and with fully as much show of reason, that as the fish were regularly fed with “boiled liver rubbed small,” besides their natural supplies from the surface and the bottom, it is supposable that but for that *none* of them would have developed the migratory instinct until the second year. Still further, it is said that if the fish had been in the open river, subject to the influences of floods, they would have descended the first year; but yet again it is replied, and with at least equal show of reason, that if the fish had not been led, or encouraged, or almost driven out of the ponds, none of them would have removed the first year.

It will be thus seen, that the parties struggling against the Stormontfield decision differ mainly on the matter of fact whether the conditions of the experimental ponds were such as to stimulate or to retard the growth of the fish's instincts—whether, as Mr. Thomas Stoddart expressed it, “that, being kept in a state of comparative confinement, they had their growth stunted and their instincts overruled ;” or whether, as others maintain, by living in a warmer climate, by being better supplied with food, and by getting, as it were, an “assisted passage” as emigrants, they had not their growth hastened and their instincts prematurely developed. Both parties really proceed more or less necessarily in ignorance or assumption of the actual facts, the probabilities, however, preponderating considerably in favour of those who maintain that the ponds must have a stimulating effect. Both parties also assume that the temperature of the water, the supply of food, and the ease or difficulty of egress, affect one way or other, to the extent of exactly a year, certain natural changes, for which it would seem more rational to assume that nature had appointed an unchangeable season. That growth, and even sexual maturity, could be affected to such an extent by such means is quite credible ; but, as we have before suggested, it is not so easy to believe that such influences could alter by a whole year the time fixed by nature for not only turning from brown to white, but for removing from fresh water into salt. By far the most probable conclusion is, that the peculiar circumstances of the ponds did not operate one way or the other, but that we have been seeing in them just what goes on every year in the open river.

A small difficulty or doubt, however, affecting the half-and-half theory, remains even after we have accepted as decisive all that the ponds have told us. Though we know that some of the year-olds left the ponds for the river, we do not know that they left the river for the sea. Placed between the conflicting assertions of the two parties, the inquirer may naturally ask, Had the young fish that left the ponds, after the close of their first year, the migratory dress and habits, or had they not? For if they had, their departure was obviously a regular process of nature; if they had not, their leaving the pond would not be sufficient evidence of their intention then to proceed to the sea. Here, unfortunately, the accounts of the first and best known experiment were somewhat conflicting. On the 2d May 1855 (*i.e.* when, on the one-year hypothesis, the time of migration had arrived), the fish in the ponds were examined by a highly competent committee, including Lord Mansfield and the late Mr. James Wilson the naturalist, and the decision was that they were *not* ready to descend. But on the 19th of the same month, there was a meeting of a portion of the committee, at which it was agreed that the fish *were* ready to descend. The grounds on which this latter conclusion was come to, do not appear to us to have sufficient extent or certainty. The principal fact mentioned is, that twelve of the fish were taken by the rod, and that, out of these, five were, according to the judgment of the persons present, in a migratory condition. These seem rather slender data on which to arrive at and put in force so large a conclusion, especially as even Mr. Shaw had stated that he had

found a few individual exceptions to his second-year theory, and as the advancing season, with its increased supplies of food, does give to all kinds of fish a clearer complexion or gayer coat, which might in many cases be mistaken, especially by those not disinclined to the discovery, for the sea-going garb of the smolt. Further, when the second year came round, it was found that the remaining fish had changed their appearance by the 26th of April (*i.e.*, a week earlier than the time when no such symptoms could be detected in the fish of one year old); they were going off in shoals by the 28th of April, and were all gone before the 24th of May—the migration of the fish of two years old being thus finished at a period of the season at which fish of one year had, according to the statements of the one-year champions themselves, scarcely begun to show the slightest symptoms of change. This was a fact pretty strong against the one-year theorists, but it was liable to the deduction or doubt arising from the great difference of seasons as to temperature; and the facts of the years that have passed since go to confirm the observations and twofold conclusions of the first year of the experiments. These facts have been most carefully noted and clearly recorded by Mr. Robert Buist of Perth, a gentleman who, from his long experience, his powers of observing, and his caution in coming to decisions, has done much service in the matter of the salmon, both as to natural history and commercial interests. The results, then, to which the evidence of the Stormontfield ponds seems to lead, in the question as to the period at which the young of the salmon makes its first migration, are chiefly these : one-half of the young

fish emigrate after the end of the first, the other half after the end of the second year ; the date of departure varies to the extent of weeks in different years according to the temperature ; and, *cæteris paribus*, the two-year-olds go off a week or two earlier in spring than the one-year-olds.

Although, on the whole, the evidence must, we think, be held as thus establishing that one-half of the young fish descend at one year, and the other half at two years of age, still if this compromise is not accepted, and a decision one way or the other is insisted upon, then it must be held that by far the weightiest and best tested evidence is in favour of two years. For, while there are doubts and disputes (at least as to the first experiment) in what degree the fish that left the first year exhibited the migratory instinct, there is no doubt whatever that a full half of the fish did not then exhibit any symptom of migrativeness, but declined all invitations to remove until the second year.

The third question, Whether the young of the salmon, after descending as a smolt, ascends that same season or the next, has been rather raised than laid by some rather loose experiments, which is the more to be regretted, as its settlement would also have conduced very greatly to the settlement of the preceding point, as to the age at which the smolt descends. If, at the experiment first made, a portion of the Stormontfield smolts, supposed to have descended to the sea at one year old, had been sufficiently marked, and some of them been captured that same season after their return from the sea, it would have been made certain, both that the one-year-

old smolts that left the pond *had* descended to the sea, and that their residence there extended to only a few weeks. But—probably because this point did not involve the chief or primary object of the experiments—care was not taken at first to manage so as to bring about anything that can be safely regarded as a decision. Of the smolts that left the pond the first year, between 1200 and 1300 were marked by cutting the second dorsal fin, and of these 22 are stated to have been caught as grilse that same season ; of those that left the pond the second year, 1135 were marked by cutting the tail, and of these “several” are reported to have been caught as grilse in the course of *their* season ; and Mr. Buist has reported similar results in more recent years. Such facts must of course reckon as something ; but there are several serious deficiencies in the evidence on that side, and some very formidable facts on the other. No firm faith can be placed in the system of marking by cuts—any one that, by examining the heaps of fish as they are tumbled from the nets, or by any other means, has had an opportunity of observing the great number and infinite variety of marks and maimings produced for the most part, it would appear, from encounters with marine enemies, will have a strong distrust of any such tests. It is not enough, we submit, that out of the 30,000 or 40,000 grilse caught in the Tay in 1855, twenty-two had an abscission on a certain fin, such as was inflicted on 1100 of the smolts of that year ; it might perhaps have been as possible to find among the 40,000 twenty-two individuals with a cut on their *tails* similar to that which was not inflicted on the smolts till the next year.

It has also to be taken into account that, on the Tweed and other rivers, a variety of experiments by cutting had been going on for years, and that some of the fish operated on elsewhere might have wandered into the Tay. If cutting were to be relied upon at all, it should be not a mere *slice*, which the teeth of a seal or porpoise may accidentally imitate with complete success, but something peculiar, and, so to say, complicated and inimitable, such as the perforations on railway-tickets (o ooo $\overset{o}{oo}$). While the evidence in favour of the ascent being made in the same season as the descent is thus wanting in positiveness, there is evidence very positive in quality, though small in quantity, to the opposite effect. Of all the smolts marked by the attachment of rings or other effective means, whether in the Tay or other rivers, *none have been got*, as either grilse or salmon, *the first year*, and *several have been got the second year*. Of the Stormontfield smolts of the second year—descending in spring 1856—300 (in addition to the 1135 which were cut) were marked by silver rings; and of these none were got. It is quite possible indeed that all of the 300 that escaped their enemies in the sea, or even, we will suppose, the entire 300, “no wanderer lost,” may have returned to the Tay as grilse that season, and yet none of them have chanced to be caught. But from other quarters we have what seems positive evidence in favour of the second season. In various years a great number of Tweed smolts were marked by a silver wire passed through and fastened to the back part of their tails; none of them were got as grilse or salmon the season they were marked, but the next season

several of them were caught as most indubitable grilse. Still later, experiments on the Tweed, apparently on a smaller scale, but conducted with great care, have brought out the same results. The Duke of Roxburghe has preserved in his possession a fish which was marked as a smolt by the insertion of a peculiarly-shaped wire through his gills on the 14th May 1855, and which was caught on July 21st of the *following* year as a grilse, weighing $6\frac{1}{2}$ lbs. The more recent experiments of Mr. Ramsbottom, at Doohulla, have also gone to support the doctrine that the fish does not return until after from thirteen to fifteen months in the sea ; smolts turned out of the nursery-ponds, and marked in May 1862, having been caught as grilse in June, July, and August 1863, though there is in this case a possibility that the smolts may have been turned out before they were ready to emigrate, and may, after their expulsion, have spent in the river one of the two years which Mr. Ramsbottom assumes that they spent in the sea. To what conclusion, then, on this point do the experiments conduct us? To nothing absolutely certain ; but as a probability, supported by evidence small in amount, but strong in quality, to this, that some at least of the smolts do not ascend as grilse, or as anything else, till *next* year, or fifteen months after their descent ; and as another probability, supported by evidence greater in amount, but not so strong in quality, that some of them return the *first* year, or three months after descent. It may thus be that both views are correct (and here let us state that the merit of having raised wholesome doubts and intelligent objections to the generally accepted same-

season theory lies with the late Mr. W. Paulin of Berwick) ; but giving proper weight to the consideration that most of the ascertained facts, as distinguished from the disputable ones, go to support the second-season theory, that side has perhaps a present advantage in the controversy. The actual evidence in favour of the second-season view might be supplemented by arguing that, as a grilse weighs more pounds than a smolt does ounces, or, in other words, has increased in weight about twentyfold, it is more rational to suppose that that great change took place in fifteen than in three months ; but even the keenest partisan of the second-season theory ought to forego that advantage, it being desirable in such questions to proceed only upon what has been seen or ascertained, not on what may be only reasonably conjectured or even logically inferred.

On the other hand, there is one fact affording a very strong presumption in favour of the same-season theorists, which we put separately, because the fact, though quite unquestioned, does not amount to actual demonstration on the point in dispute. Grilses invariably ascend two or three months after the smolts of that season have descended ; or, to state it in another form, there are no grilse until the smolts have been some time departed. Now, if grilse have been a preceding winter and summer in the sea, why should the time of their ascent bear so rigidly fixed a relation to the time of the descent of the smolts, when we find that the adult salmon, which is, or has always been held to be, the same fish one year older, makes its ascent in some proportion in every month of the twelve ?

But here we are brought up with a jerk, so to speak, by the new and startling question, *Is the grilse a grown and transmuted salmon-smolt*; or, in other words, *is a grilse an adolescent salmon*? Till lately, there was no question about it,—it was held that the smolt returned as a grilse, and that the grilse was simply a virgin-salmon, or a salmon on its first ascent. Lately, however, these assumptions have been strongly assailed—first questioned in a book, and then pronounced upon in an authoritative way by a Committee of the Commissioners of the river Tweed, who say, in their Report (1863), “Our opinion, from the experience of the last twenty years, is, that grilses never become salmon of any stage whatever.” This is an audacious and almost unheard-of heresy. It could scarcely be said to have ventured into the light till a year or two ago, when a Ross-shire laird, a salmon controversialist by hereditary descent, inflamed with what he thought a great discovery, “came rushing from his mountain home,” and hurled a biggish book, charged with heretical matter, among a generation all sections of which had been accustomed to accept the old orthodox doctrine as beyond doubt or question.

Great was the astonishment, and just the indignation, of the baker’s wife in “*Candide*,” on hearing that there was a man down stairs who hesitated to declare his belief in the fact of the Pope being Antichrist. But what was that display of unbelief to some which we are doomed to witness in this bold and sceptical age? Here was a man—a Man of Ross—who actually hesitated to declare his belief in the popular and accepted fact of a Grilse being a young Salmon. Nay, worse; that luck-

less prig Candide did not, in dealing with the baker's wife, venture on any counter proposition, but simply declined to enter on the Catholic question at all, on the preposterous plea (destructive of half the controversies which enliven the world) that he knew nothing about it, whilst he did know that he was starving, and that the lady's husband was a baker, whom he had just heard make an eloquent speech in praise of charity. But our heretical friend, Mr. Mackenzie of Dundonnell, went the length of an entire denial of the orthodox ichthyological creed, and greatly aggravated his offence by showing that he did know a good deal about the matter regarding which he had arrived at such unhappy opinions. Indeed, the heresy was so bold and wanton as almost to justify suspicions as to the motives of the heretic. To "make a reputation," it is perhaps a surer way to table a negative of something that everybody has taken as unquestionable, than to discover something positive that nobody had thought of. If a man were to arise, preaching that ducklings do not become ducks, nor leverets hares, nor lambs sheep, he would, according to what has hitherto been the scientific, and almost equally the popular apprehension, be in much the same position as that in which this undaunted northern placed himself. What if Dundonnell has been actuated, not by a reckless zeal for what he conceived to be the truth, but rather by a burning thirst for fame? What if he has been only frenzied with an ambition like to that of Eratostratus, and sought to gain an undying, if undesirable, reputation, by setting fire to the Tay, the Tweed, and all other salmon rivers?

It is not so ; he is full of his subject, not of himself ; and seems to have as keen a feeling for the honour, dignity, and especially the independence of the grilse, as he could have were that interesting fish a sept of the Clan Mackenzie. But if he had had somewhat better evidences of his doctrines, he would certainly have succeeded in setting fire to one of the theories of our naturalists, and to many of the acts of our legislators. To say nothing of the interest attaching to the question as one involving some very curious facts in natural history, it is important to know whether our legislators have been here all along proceeding on an erroneous assumption—taking for granted that they were dealing with one species of fish, when they really were operating upon two distinct species, having different habits, especially different seasons, and therefore, to some extent, requiring different legislative treatment. It is certain that Mr. Mackenzie has found room to raise doubts—chiefly, however, by the use of positive and plausible statements, in opposition to what has hitherto been the popular, if not unanimous belief ; and to support these with an ingenuity which in some cases succeeds in at least perplexing, and in refusing to be set aside by mere off-hand denial. Still we are not disposed to like the mode in which he has conducted his argument, and we *are* disposed, having doubtless been predisposed, to dispute his conclusions. The form in which he proceeds is the dangerous one of dialogue. A friend named “H.” is allowed to indulge in mild suggestions in favour of the old orthodoxy, and then “M.,” as is the manner of Highland gentlemen, replies with great heat and vigour, *dirking* his inoffensive antagonist

in every round. In fact, the combat is too like a "cross." "H." appears to us rather too amiable a person to deal on anything like equal terms with a man so terribly in earnest as "M." is about grilse. Struck by the incompetence of "H.," and actuated by the impulse which leads generous minds to sympathize with the weaker party, we shall step for a little into "H.'s" shoes, and see if we cannot make a better fight of it. Having put ourselves in training by going through a course of the evidences, we feel stimulated to the resolution of imploring Dundonnell to bear with us whilst we attempt to show, to his entire dissatisfaction, that, after all, he and the Tweed Committee are quite wrong, and the remainder of his fellow-creatures quite right.

It is strange that there should be room left for a doubt on the subject; or that, if there be room, the doubt should not have been raised until these latter days. It is true that a few "practical fishermen," here and there, have been known to whisper the heresy which Mr. Mackenzie first publicly preached, and which has now been (nominally) adopted by the Tweed Commissioners; but none of these early and obscure perverters of the faith were known to have given intelligible reasons for differing from their neighbours.

On the other hand, it must be admitted that, owing mainly perhaps to the want of any formidable opposition, our naturalists have rather assumed, than proved or tested, the common theory; and let us say, as a fact which will be forced upon any one who takes a run back over the writings of naturalists on the *Salmonidæ* during the last thirty years, that there has been an appalling

number of assumptions propounded as settled facts, and afterwards more or less quietly withdrawn, and the correction substituted. Look, for instance, even at the excellent James Wilson's article "Ichthyology," in the seventh edition of the *Encyclopædia Britannica* (1838), and at the answer which, *more Scottice*, he gave himself in 1840, by asking in *Blackwood* the question, "What's a Parr?" Although the fact is chiefly due to the previous absence of question or controversy, still it is a fact, that almost any naturalist, if asked how he knows that a grilse is a young salmon, would not be able, on the moment, to lead any more satisfactory evidence than general and apparently instinctive belief. But such answers will not suffice in questions susceptible of proof by fact and experiment, though necessarily admissible, and often even the best of evidence, in cases of another class. There is a story told of a Scotch minister, on a catechizing raid, after having got the proper answer from a ploughman to the question, Who made you? proceeding most unfairly to the further question, "How do you know?" Jock grew red in the face, scratched his head, and then, rising, by an instinctive leap, to the height of the argument, replied, "It's the common clash o' the kintra." Now, this was a sound if grotesque answer, on the main question of natural theology, in which a general assent, founded on instinctive perception, is one of the best of evidences. But in such questions as those of natural history, or at least in this question, where there are attainable facts sufficient to settle it one way or the other, it will not do to adduce the "common clash." It is only lately, however, that

the facts can be said to have been publicly and formally called for ; and the case must now go to proof.

Whether a grilse (admittedly a fish of the salmon *genus*, but smaller in size, and slightly different in appearance, compared with the fish everywhere acknowledged as the true salmon) is an adolescent salmon on its first ascent from the sea, or is a distinct *species*, comprising, of course, both adolescent and adult fish—that is the question. All scientific, with almost all popular belief, supports the first proposition ; Mr. Mackenzie of Dundonnell, and a few others who have not ventured upon paper, maintain the second. As in most ichthyological questions, especially those relating to the migratory tribes, there is an insufficiency of direct evidence ; and what there does exist of direct evidence we shall reserve till after the leading of the circumstantial proofs. The points to be dealt with relate to the habits of the fish, especially as to season—to the proportion that salmon and grilse are found to bear to each other, both in given rivers and in given years—to the size or weight—and to the shape or appearance. What we shall adduce under these heads will, we hope, be found to go almost the whole way to prove that there is *some* sort of connexion between the two kinds, or rather sizes, of fish ; and a very long way to prove that the connexion or relation is that of youth and adult.

Foremost among those evidences we would place the fact (already alluded to in discussing the period of the fish's first return to fresh water), that salmon ascend rivers more or less in every month of the year, whilst grilse do not ascend at all until a certain period, and

then, so to speak, come all at once ; from which two facts, we submit, it is a fair inference that the one is an adult fish, capable of ascending at any time, and that the other is a young fish which first attains to the capacity of ascending at that season at which its ascent is practically found to begin. Or put it thus—the difference in the time of ascent points to the inference that salmon are the produce of several years, and grilse of only one year. It may be possible to dispute the inference ; but it is necessary, to a fair discussion of the question, that these *facts* should be looked at, and, if possible, fitted with some other explanation.

It is the chief defect of Mr. Mackenzie's argument, that he not only overlooks these and similar facts, but founds upon assumptions to the contrary. Thus, he begins by saying, that "a grilse's instincts, in some respects, are different, though its habits are precisely the same ;" a proposition which, if it does not contradict itself, is at least contradicted by what follows :—"Experience shows us that salmon, impelled by their instinct, leave the sea for their home or rivers in winter and spring, whereas the grilses do not leave the sea for the rivers until summer ; clearly showing that the one is a spring, and the other a summer fish." How the two fish thus described can be spoken of as being of "precisely the same habits," is perplexing ; yet, though it might seem at first sight that the greater the difference of habits the better for Mr. Mackenzie's theory of two different species, it is yet a fact that, in the above passage, he *under-states*, as well as *mis-states*, that difference. The difference is not that the salmon is "a spring

fish," and the grilse "a summer fish," but, roundly speaking, that salmon come at *all* seasons, and grilse at only *one* season. The assumption that salmon cease to ascend in summer, is utterly inadmissible, though there are some rivers where, owing to temperature and other natural conditions, the statement is, in a loose sense, partially true; and we shall bring that, and some even more important statements, to the test of the only authentic figures we know of, showing the capture of the different kinds of migratory *Salmonidæ* in each month of the year. The following shows the proportions of salmon, of grilse, and of trout (almost entirely the *Salmo eriox*), to every 1000 of each kind caught, on an average of years, in the net-fisheries of the river Tweed:—

	Salmon.	Grilse.	Trout.
February (2d half of),	22	0	8
March,	56	0	7
April,	89	0	23
May,	128	1	56
June,	138	13	173
July,	233	371	254
August,	151	408	164
September,	113	154	129
October (1st half of),	71	53	186

There is here, in the first place, sufficient refutation of the statement that the "salmon is peculiarly a spring fish," and peculiarly *not* "a summer fish;" for we see that, on the Tweed at least, the months showing the smallest proportions of salmon to the whole take of salmon, are February, March, and April; and the months showing the largest proportion, June, July, and August.

But the point to which we direct attention is the

contrast, or contrasts, shown as to season, between grilse, and not only salmon, but also trout. It will be understood that the theory which we support assumes the salmon column to comprise only the adults of a certain species, the grilse column the youth of the same species, and the trout column both the adults, and, for part of the season, the young, of quite another species; whilst Mr. Mackenzie's theory assigns to the salmon and the grilse columns respectively both the young and adults of a distinct species. Now, let us see whether the facts ascertained are most reconcilable with our theory or with Mr. Mackenzie's—with the old orthodoxy or the new heresy. The most important contrast lies in the fact that, whilst (doubling for the odd half month) 44 in each 1000 of salmon, and 16 in each 1000 of trout, are captured in February, and the take of both goes on increasing till, in May, salmon have reached the proportion of 128, and trout of 56 per 1000; grilse, on the other hand, are entirely absent in the first three months of the season, all but entirely absent in May, and show but a small advanced-guard even in June. These facts are at least reconcilable with, if they are not demonstrative of, the theory that the grilse is a young fish, performing its first ascent. Grilse do not ascend, as do salmon and trout, in February, March, April, or even (in the case of Tweed) May, because they are then only descending in the condition of smolts, or are undergoing their growth and transmutation in the sea.

Or look at the figures of the *latter* portion of the season as above exhibited, and they will be found to witness to the same effect, though not quite so conclu-

sively, as the figures of the earlier months. In the months of July and August, nearly eight-tenths of the whole grilse of the year are captured ; in the month of August alone, more than four-tenths. But September, as compared with August, shows a diminution of two-thirds, or 66 per cent., the capture of that month being three-twentieths of the capture of the whole season ; October shows a diminution of another third ; and November, were the fishing continued, would probably show pretty nearly a blank. Turning, however, to the salmon, we find that in those two months, July and August, when eight-tenths of the whole grilse ascend, only four-tenths of the whole salmon ascend ; that in September, when the grilse have decreased 66 per cent., salmon have decreased only 30 per cent. ; and that in October, as compared with September, when grilse show a decrease of another third, salmon show an *increase* of nearly one-third, and have become again almost as numerous as they had been in September. Briefly, salmon ascend in every month of the year, in numbers, comparatively speaking, not very unequal ; grilse, speaking roundly, do not ascend at all in the first half of the year ; all of them, but a fraction, ascend within two consecutive months in the middle of the year, and in the latter months of the year their ascent almost ceases. Mr. Mackenzie would account for all this by saying that these are two different species of fish ; and he finds it necessary to go the length of saying that the one is a spring, and the other a summer fish. It might be possible, were there no facts beyond those we are at present dealing with, to assume that there are two species of migratory fish, one of them, not a

spring, but an all-the-year fish, the other mainly a summer fish. All that we maintain, on the evidence yet adduced, is that the facts are at least equally compatible with, and indeed entirely suitable to, the theory, that the fish coming up all the year are the adults of various ages, and that those rushing up in a body in summer are the young of the same species.

To the same effect, though necessarily with less distinctness, is the rather curious evidence supplied by the trout column in the preceding table, which, according to the hypothesis we are maintaining, differs from the salmon column, comprising only adults, and from the grilse column, comprising only what we shall call, perhaps not with strict accuracy, adolescents, in comprising both the adults and the adolescents of another species. Because the trout column comprises adults, it shows, like the salmon column, a larger or smaller number ascending every month in the year; because it contains also adolescents, it shows, like the grilse, a great and sudden increase in certain summer months. Up till the end of May, the trouts are few, but in June they suddenly increase by 300 per cent., salmon in that month increasing only 12 per cent., and they increase another 50 per cent. in July, in which month nearly a fourth of the whole capture is obtained. We account for this feature by saying that here we see the effects of the adolescent trouts, on their first ascent, being added to the adults; and, though rather anticipating another portion of our argument, we may add, that this view is supported by the falling off in the average weight of trouts during the months when we suppose the young to be making their first ascent.

Then, as has been done with the salmon and grilse columns, take the *latter* portion of the year : in August, as compared with July, the trouts fall off nearly 40 per cent., and in September decrease by other 20 per cent. ; which shows, as in the case of the grilse, that the run of young fish is slackening. It is true that in October the number of trouts again increases, but that arises chiefly from the well-known fact that in that month, and later, comes the great rush of trouts seeking to spawn ; and, even if this were not notorious, the fact that these late comers are adult fish, is indicated by the average weight and size being much greater than in any month preceding. Is there any producible explanation why the supply of trouts, extending more or less over the whole year, should so suddenly increase for a short time in summer, but the hypothesis that at that time we are getting the fish which are only on their first ascent, along with those which are on their second, third, or fourth ? And do not the facts, that we see a similar, but greater and more sudden increase and decrease in the grilse, and do *not* see such indications in the salmon column, supply, to say the least, a very strong presumption that in the trout column you have both young and old, in the grilse column only young, and in the salmon only old fish ?

In order to put our best foot foremost, we have not adhered to logical sequence, and now adduce a fact which properly should have come first in order : the fact that salmon and grilse are always found together—*i.e.*, that where there are no salmon there are no grilse, and where there *are* salmon there are grilse, and *vice*

versa ; and further, that the two fish are found not only together, but bearing numerically a certain rough proportion to each other. In the earlier stages of the great parr controversy, as already mentioned, a similar fact—that where salmon were present, parr were present, and wherever either were absent, so were the others—played a great part, forming the chief weapon of the supporters of the theory that the parr is the fry of the salmon, but was not held conclusive till afterwards confirmed by Mr. Shaw's and subsequent experiments. Neither in the present case can the fact of grilse and salmon being always both present or both absent be held as conclusively *proving* a connexion, though it supplies a very strong presumption ; and the supplementary evidence, though attainable, is not yet forthcoming in a complete shape. But we are not altogether without evidence additional to the fact of the two fish being always co-inhabitants.

The difficulty we have here to meet is the fact that the presence of the salmon and grilse in this or that river might be explainable merely by the facts that they are both migratory fish, and that the rivers are accessible or inaccessible to both alike. But salmon and grilse are not the only migratory fish ; and what if we can show that other migratory fish of the same *genus* abound in some rivers, and are almost unknown in others equally accessible, whilst the same thing is never seen in the case of salmon and grilse ?—that is, there are no rivers almost destitute of grilse and abounding in salmon, or the opposite. Mr. Mackenzie says, “The Tweed bull-trout, commonly known as the ‘black-tail,’

a very conspicuous fish, may be intercepted on its way from the north, but it has never yet been seen to the south of the Tweed ; and if its instinct was not perfect, the Dee, Don, and other rivers, by this time of day, would abound with it, as the Tweed does." There are here two serious errors in matter of fact, as well as a correct statement which goes quite against Mr. Mackenzie's argument. One of the errors we are not much concerned to correct here : "black-tail" is the local name not for the bull-trout (*Salmo eriox*), but for a very much smaller fish—one of the tribe of the *Salmo albus*, now generally held by naturalists to be only the young of the *Salmo trutta*, or whitling. The other error, which we have a greater interest in correcting, is the statement that the bull-trout is "never seen to the south of the Tweed," when, in fact, the two rivers immediately to the south, the Aln and the Coquet, are full of that species, to the almost entire exclusion of salmon and grilse. Mr. Mackenzie, however, is perfectly correct in saying, that if the instinct of the *Eriox*, like that of migratory fish in general, were not pretty nearly perfect, it would be a common fish in the rivers to the north of Tweed, the mouths of which it is held to pass in its marine migrations. The facts as to the *Salmo eriox*, or bull-trout, are, that in the Tweed that species is four times more numerous than the adult salmon, and as numerous as both salmon and grilse taken together ; that in the two rivers to the south of Tweed, there are apparently about fifty bull-trouts to one salmon or grilse ; but that in the Forth, the Tay, and other large and accessible rivers to the north, the species is almost a stranger. In short, the

bull-trout is seen to be entirely independent of the salmon and the grilse, being found in great multitude where they are almost entirely absent, and *vice versa*. Now, if the grilse were a species as distinct from the salmon, or *Salmo salar*, as is the bull-trout, should not we find similar results, some rivers abounding with grilse, yet almost without salmon? But what is found is not this, but the contrary: many or few grilse imply many or few salmon.

Mr. Mackenzie makes a sort of loose or partial denial of this fact, by adducing the statement, that the Shin in Sutherlandshire, a valuable salmon river, contains so few grilses that they "are not calculated upon as part of the commercial produce." But we have ascertained that this statement, so far as it is correct, is entirely explained away by the fact that the Shin river is fished, not by nets, but by a *cruive*, the *hecks* of which are of such width as to permit most of the grilse to pass. This, of course, accounts for the grilse forming a very small part of the commercial value of the river; but it does not prove that few grilse frequent the river; in point of fact, they abound in much the usual proportion to the salmon, and as many as twenty have often been killed by a single rod in one day. Besides, the fact, which we do not deny, that the proportion of grilse and salmon *captured* varies greatly in a comparison between different rivers, would not in the slightest invalidate our argument, nor establish Mr. Mackenzie's; because the proportion of captures of each kind is regulated not entirely by the numbers of each frequenting the river, but by various other circumstances, both artificial and natural. For

instance, the net-fishing used to be voluntarily stopped in some rivers before the run of grilse had nearly ceased, whilst in others, the fishing was carried on for six weeks later, or till after the conclusion of the run of grilse ; and the difference is great between different rivers and estuaries as to the natural facilities for capturing a fish which does not rest and loiter like the adult salmon, but rushes on, if Mr. Mackenzie will permit us the phrase, with the ardour of youth, and of youth, too, on its marriage-jaunt. But such cases do not destroy the fact that salmon and grilse are always either both, or neither, inhabitants of any given river ; and comparatively few of those cases even disturb the fact that they are found present in certain proportions to each other, and just in such proportions as we might expect to find between the adolescents and the adults of the same species.

Take next the test furnished by a comparison of season with season, instead of river with river. Mr. Mackenzie says, "It is a common remark amongst fishermen, that though the salmon fishery may be bad, still the grilse fishery may be productive ; each fishery varying in quantity to correspond with the favourable or unfavourable season in which they were spawned—clearly showing two distinct fisheries and nature of fish." Not at all. The "common remark among fishermen," the accuracy of which we have no motive to deny, does not necessarily imply two distinct kinds of fish ; but, at least as probably, different broods of the same fish, born in different years and representing different spawning seasons. Not only, however, is Mr. Mackenzie's fact as to grilse being sometimes abundant in

years when salmon are scarce, and *vice versa*, of no more value to him than to us ; but if he had looked a little more closely, he would have been staggered to see how much of *method* there is in the relations which the supplies of each bear to the supplies of the other, which method has apparently a great deal of meaning. It is a pretty general belief among old fishermen that a good grilse season is more than likely to be succeeded by a good salmon season in the year following, and a bad grilse season by a bad salmon season ; and, though we are shy, on such subjects, of the mere *dicta* of “ practical men,” who generally derive their data from a very narrow range of experience, and draw their inferences with no very enlightened regard to logical rules, yet on this point they could scarcely go far wrong ; and we can adduce some authentic returns, which, in a very remarkable way, corroborate their belief and our explanation of the fact on which their belief is founded. The latest period of five years, for which we have returns of the take on Tweed, shows an annual average capture of slightly more than 9000 adult salmon, and of slightly less than 24,000 grilse. In 1851, the first year of these five, the take of grilse was only 16,855, or about two-thirds of the annual average ; and in the following season, 1852, the take of salmon was only 5808, bearing just about the same proportion—viz., two-thirds—to the annual average of salmon, as did the grilse of the year preceding to the annual average of grilse. But in 1852, grilse rose to nearly 29,000, considerably *above* the annual average ; and in 1853, salmon rose to 9200, also considerably *above* the annual average of that period of five years. In 1853 there was a great

take of grilse, 43,000, or considerably more than one-half above the average ; and in 1854, salmon reached 15,300, also more than one-half above the average. In 1854 grilse declined to 16,739, one-third below the average ; and in 1855 salmon declined to 6239, also one-third below the average. In a word, the proportion which the grilse of any one year bore to the average number of grilse, is found by these tables to have been just about the proportion which the salmon of the *following* year bore to the average number of salmon. These facts seem almost too neat and complete as evidence of our theory that the grilse of one year are the salmon of subsequent years—not, indeed, that they “prove too much,” but that they fit into our doctrine so exactly as almost to give them the appearance of having been made to measurement. But similar results are seen in a less regular and perfect form, in the less regular and perfect returns from other fisheries. Probably the Mackenzieites may hold them to be only coincidences ; but they must also admit, that they are not only very remarkable, but for them exceedingly disagreeable, coincidences.

The element of weight or size, which may be held to include that of growth, is very important ; but Mr. Mackenzie so deals with it that there is some difficulty in getting hold of him. He says : “One simple and palpable fact, which any ordinary observer might have remarked, is, that grilse in May weigh from three to five pounds ; in July they are met with as large as from ten to twelve pounds ; and instead of finding them in August and September grown to the size of sixteen or twenty pounds, which would be but natural if they continued

to grow to become salmon, they apparently begin to grow backwards; as in October we have them as small as we had them in May, not growing one inch larger from that time till they return to the sea in March and April as kelts. . . . If grilse grew to be salmon, and as rapidly as is generally supposed, we should have no grilse in October, but all salmon." We have two accusations against this passage: the ideas are confused, and the allegations are unproved and improbable. In the first place, there is a confusion between the individual and the species. Mr. Mackenzie speaks as if the grilse that ascended in May were the same individual grilse that ascends in the later months of the year, and asks why the individual has not grown any in three months; whereas there are two different persons, of much about the same age, in so far as they were born in the same year, the difference in their periods of ascent arising mainly from the slight difference of several weeks in the date of their birth or of their descent, and from the variety of circumstances that have shortened or prolonged their residence in the sea, the late-comers being for the most part those which have remained longest, and consequently grown largest. In the second place, Mr. Mackenzie has strangely assumed that it is maintained that grilse grow into salmon whilst in the fresh water; whereas, what is maintained is, that besides not growing in size in the river, grilse do not even *begin to grow into salmon* until they return to the sea; that they ascend as grilses, descend as grilse-kelts, and after their return to the sea become salmon, and as such reappear in the rivers. Then, as to the facts,

where is the evidence for saying that grilse are small in the beginning of the season, large in the middle, and small again at the close? Mr. Mackenzie may be in possession of such evidence, but he has kept it to himself. We also have some evidence on the point, of which, in no expectation of gratitude, we shall give him the benefit. On a series of years, the average weight of the grilse captured on the Tweed fisheries was—in the month of June, 3 lb. 11 $\frac{1}{4}$ oz. ; July, 4 lb. 5 $\frac{1}{4}$ oz. ; August, 4 lb. 15 oz. ; September, 5 lb. 12 $\frac{1}{2}$ oz. ; October, 6 lb. 11 $\frac{3}{4}$ oz. These figures are refutatory of the statement that grilse diminish in weight towards the end of the season, though we are aware that it may, and sometimes does happen, that there are great temporary variations, caused by the differences of seasons affecting the temperature of the atmosphere and of the water ; as, for instance, in a warm summer the grilse of July or August will be larger than in a cold summer. But the statement, even if correct, would not help Mr. Mackenzie, nor injure us. If it were true that grilse fluctuated in size during the season, and were even smallest in the latest months, the fact would prove nothing in favour of the fish being a distinct species, and nothing against, but rather something in favour of, their being adolescent fish, born in one year, though with a difference of weeks as to birth, and of various circumstances as to growth. What we do see is, that (at least in the case of Tweed) grilse go on increasing gradually in size to the end of the fishing-season ; that increase, such as it is, being, we maintain, caused mainly by many of the late-comers having had a more protracted residence in the sea, where

alone the migratory *Salmonidæ*, subsequent to the infant stages, have any perceptible growth. A different result is seen in the case of trouts, the average weights of which decrease during those summer months during which the young, or first-ascenders of the species, add themselves to the older fish ; a comparison between the two columns in respect of weight, as we have already seen in respect of number, showing just such differences as would arise from one column comprising only old fish, and the other both old and young.

But, besides showing that Mr. Mackenzie fails to make anything in his favour out of the facts as to weight and size, we show that, in at least two respects, those facts are dead against him. 1st, There is a great range between largest and smallest in salmon, and a very small range in grilse ; 2d, There are very few—roundly speaking almost no—salmon of those weights which may be called the grilse weights. Taking even monthly averages, which obviously can bring out very imperfectly the facts we speak of, the average weight of Tweed salmon in one month is 7 lb. 10 $\frac{3}{4}$ oz., and in another month 16 lb. 2 $\frac{3}{4}$ oz. ; and everybody knows that there are comparatively few salmon below the smaller of those monthly averages, and a great many above the larger—a fact corroborated by the month which shows the largest average weight showing the greatest average number, and by the month which shows the lowest average weight showing also by far the smallest number. But we do not see this in grilse—the difference between the smallest and the largest (excluding, of course, rare individual cases), being seldom so much as three pounds.

What we say is, that the wide range of size and weight in the case of salmon shows a wide range of ages and circumstances, and that the comparatively small range of size and weight in the grilse, we shall not say proves, but indicates, a very much narrower range of ages and circumstances.

But as we are here perhaps open to the reply, such as it is, that the grilse may nevertheless be a distinct species, its narrower range of size being accounted for by its being in its adult stage a much smaller fish, we go on to the second point, and ask, Where are the salmon when they are of the weight of, say, $4\frac{1}{2}$ or 6 lbs. ? That salmon of such weights are often got, is true ; but it is also true that, in proportion to the whole number, *that* is the weight at which by far the fewest are got—especially that many more are got much above than at or about those weights. There are fewest salmon of the weight of which there are most grilses. Now, as at some time or another every salmon must be of those weights, the presumption is that we ought to see many more of *them* than of the higher weights, which, in the main, signifies the greater ages—in short, if Mr. Mackenzie's theory were correct, we ought to see more salmon of those small sizes than of the large sizes, just as in our own species we see more youths than elderly people. Those youthful salmon do undoubtedly exist. Mr. Mackenzie, if he hold to his theory, cannot tell us where they are. We point to the grilse, and say, *there* they are.

On the point of appearance, Mr. Mackenzie possesses whatever advantage or disadvantage there is in the fact

that the difference between a grilse and a salmon cannot be very easily *described*. But what interest has Mr. Mackenzie in maintaining that there is no obvious or reliable distinction in appearance between a salmon and a grilse? Maintaining, as he does, that the two fish are different species, the more visible the distinction the better for his argument, and the worse for our argument that they are the same fish. It is more easy to distinguish one variety from another, as a setter from a terrier, than the young from the old of the same variety, as a young terrier from an old one. But Mr. Mackenzie afterwards makes a half-admission that there *are* visible differences.

He says, "Fishermen affirm" (and he doesn't deny) "that a grilse has a *younger appearance* than a salmon." Well, that is quite enough for our purpose—and far too little for his. That is just about as much distinction as there is between a lamb and a sheep, or between a grouse or partridge of this season and its father or mother; and yet everybody who has any occasion for the knowledge, does know the young from the old of birds and beasts, although, in very many cases, any attempt to describe the difference, in the absence of specimens, would be a complete failure. Mr. Mackenzie afterwards adds, "The only distinction I could ever ascertain is that the tail-fin of a grilse tapers off to a finer edge than in the salmon." Well, that may be rather a fine distinction as between two species, but is broad enough for the distinction between an adolescent and an adult fish of the same variety, as between the maiden and the mother. Then Mr. Mackenzie, as if aware that he had

got upon slippery ground, tries to slide off with the remark that "this distinction is observable in the *smolts* also." This is quite a new statement, never heard of before, and therefore the more imperatively requiring that proof of which it has as yet received none. Who has observed the distinction?—where is it recorded? Every schoolboy on the banks of the Tweed (where almost alone the *salar* and the *eriox* are found together in plenty) knows at a glance the difference between the smolt of the salmon and of the bull-trout—the "black-fin" and the "orange-fin." But the knowledge of the alleged distinction between the smolt of the salmon and of the grilse, if not hitherto confined to Mr. Mackenzie, is a piece of useful knowledge certainly not yet diffused. Mr. Mackenzie tries again: "The absurdity of the theory consists in the assertion that the smolts of salmon, going down to the sea in company with the smolts of grilse, also return from the sea under the denomination of grilse." Where is the absurdity? There is just as much absurdity in supposing that the families of ewes who have never bred before, and of ewes who have often bred before, both appear under the denomination of lambs.

A pretty strong point made by Mr. Mackenzie is the allegation, supported by many appearances, but also contradicted by some facts, that salmon and grilse are never seen paired in connubial relations. This would be a powerful fact if established, for we do not see the young of any other species cohabiting only with the young, or the old only with the old. But then, in the case of animals in their wild or natural state, we have

a very imperfect knowledge of their proceedings, especially in the breeding season of spring, when the fur or the plumage of old and young have in few cases much visible difference. Further, salmon are migratory, and we do not know the habits of migratory creatures in that respect—for instance of swallows. Further yet, though we must yield to Mr. Mackenzie the fact that whenever a pair of fish of the salmon kind are seen together on a spawning-bed, they are seen to be, with comparatively rare exceptions, pretty much of the same size; yet in the water the eye is not capable of distinguishing in the case of two fish, say of seven or eight pounds, whether both are salmon, both grilse, or one of each. Besides, the fact cuts both ways, as indicating that, in the process of pairing, the choice is regulated mainly by considerations of size, not necessarily, nor probably, by the consideration as to whether any fish of the desired size is on its first ascent, or at some later stage of its career—whether maid or widow, bachelor or widower. All that we see really proves, not that salmon and grilse, but that large fish and small fish, have a dislike to form matrimonial relations with each other. Finally, in the experimental ponds at Stormontfield, the ova of an adult female salmon were impregnated with the milt of a male grilse, the ova fructified, and the progeny were undistinguishable from those produced by two adult parents. This fact, indeed, we might have made both the first and the last of our replies to the allegation that grilse and salmon do not breed together; but as the point does not seem to have received very much attention at those admirable ponds, and as there is always a possibility of

mistake in such experiments, the question perhaps could not fairly be held as demonstrated.

There *is*, however, one experiment which might settle, and we thought *had* settled the matter beyond all doubt—namely, the marking of grilse-kelts on their descent, and their capture on their reascent. Mr. Young of Invershin, writes that (besides marking salmon-smolts that have returned as grilse) he has often marked grilse, and that they have returned as salmon; Mr. Mackenzie says he has done so also, if not as often, with an opposite result, the fish returning as grilse. There have been many experiments conducted by marking on the Tweed; but these not having been conducted with any special reference to this particular point, the results are meagre almost to uselessness. There is there no case at all in favour of Mr. Mackenzie's theory, but there is only *one* in favour of ours. A grilse-kelt of two pounds, marked on the 31st March 1858, was caught, on the 2d August of the same year, as a salmon of eight pounds. Here again there is a possibility of a mistake, and the matter really remained to be demonstrated by experiment. That demonstration seems to have been supplied by the Stormontfield experimenters, by whom many grilses, marked when grilse-kelts, have been recaptured on their reascent as salmon; but it might be well, now that the Tweed Commissioners and Mr. Mackenzie have raised the question, if experiments directed specially to this point were repeated with increased care and in greater number.

There is, however, considerable difficulty in the way of obtaining conclusive evidence from experiments made on the fish after it has assumed its migratory habits, and

can no longer be kept under inspection and protection. Of course the number of fish marked can bear but a small proportion to the whole number of emigrants, or outward-bound ; the number of immigrants, or homeward-bound, bears, it is greatly to be feared, but a small proportion to the number that went out ; and of the fish that do return, the proportion captured by man is not large. It has often, or indeed in the majority of cases, chanced that among the captured immigrants there was not one of the marked emigrants ; even in the most successful cases, the captures have scarcely been above two or three per cent. of the marked, which, considering the risks of mistake, the possibility of tricks, and the more than probability of exceptional cases, must be regarded as supplying rather scant data.

Some of these experiments, nevertheless, even by the great extent to which they have failed regarding their special purposes, have served to admonish us of another fact of which we were scarcely in search—the fact that there is an enormous destruction of salmon life taking place elsewhere than in the rivers, and otherwise than by the inventions of man. In illustration, we give the facts of one of the cases most fully within our knowledge. In the spring of 1852, about 500 kelts were marked with wire in a pool, within a few yards of tide reach, at the bottom of the river Whitadder, which joins the Tweed immediately above Berwick. The circumstances were somewhat unfavourable—a long drought retarding the departure of the fish ; but doubtless the great majority of them got safely away. And they went

away for ever. None returned ; and only three of them were ever heard of—in each case under circumstances of the most distressing character. One of them was caught at the mouth of the Tyne, 70 miles to the south ; another at Yarmouth, 300 miles to the south ; and the third at Eyemouth, 10 miles to the north, the last individual being found in the stomach of a cod, with nothing remaining of him but his vertebrate column and the silver wire. These simple but certain facts convey a painful and pathetic idea of the remoteness and the perils of the salmon's marine wanderings. Compassion and indignation mingle at the idea of a fish of high family, gentle manners, and fastidious taste, leaving for ever the sweet-flowing Whitadder to compete with base-born bloaters at Yarmouth, or find an inglorious grave in the maw of a vulgar Scottish cod—

“ Ah ! little did thy minnie think,
That day she cradled thee,
What lands thou shouldst travel round,
Or what death thou shouldst dee ! ”

From such facts we draw only one “ practical improvement,”—that the fact of such great multitudes perishing when beyond our help in the wide and wicked sea, is, though not exactly an encouragement, an additional reason why we should take the better care of them during the periods when they are our wards and guests.

It would be dishonest to omit to mention, merely because we cannot pretend to explain, another mystery as to the movements of the salmon, which no experi-

ments have done anything to clear up. What are those *clean* salmon that run up the rivers in late winter or early spring?—where have they been in the preceding months?—what are they wanting now? They cannot be wanting to spawn, for there is no spawning for at least six months to come. They cannot have spawned early in the preceding or rather present spawning season,—gone down, recovered, and returned; for numerous experiments show that the shortest period of return is about three months, and it is only about three months since the earliest fish had begun to spawn in the river which these are now ascending. They must have passed the autumn or earlier winter in the sea. Then they must have passed the winter without breeding, and there we have the discouraging fact or hypothesis that the salmon is a fish which does not breed every year,—a hypothesis which will have the less chance of acceptance just at present, when it appears, or is supposed to have been discovered, that the herring—a fish resembling the salmon at least in the important respect of being migratory—breeds twice in each year, or, at all events, breeds at two widely different seasons of the year.

It will be understood that all or almost all that has been said here has reference only to the *Salmo salar*, or true salmon. Beyond that, in the questions about “fish of the salmon kind”—*Salmo eriox*, *Salmo trutta*, *Salmo albus*, etc. etc.—lies a vast field, almost pathless, and thickly covered with an underwood of doubt and confusion. There are, perhaps, half a dozen species or varieties, all of more or less different habits, and almost

all having different names in different localities, besides which, the same name is often applied to different species ; and the young and the adult of one species are sometimes classed as two species, sometimes *vice versa*. The facts, in short, are in darkness and confusion, and their confusion is twice confounded by an unsettled nomenclature. This part of the subject cannot be regarded as quite unimportant ; for instance, the take of the *Salmo eriox* on the Tweed is in some years greater than that of salmon and grilse together. There is, however, this consolation, that the want of knowledge regarding the various kinds of “sea-trout” is to be regretted chiefly as a deficiency in natural history—in matters of legislation, preservation, and increase, whatever is good for the salmon proper will be found, generally speaking, about equally good for his poor relations and social inferiors.

CHAPTER III.

DECAY OF SALMON.

Amount of the Decay—Periods—Causes.

GREAT as has been the decay in the supply of Salmon in the United Kingdom, there has been a tendency to rate that decay rather above than below its true amount. That the numbers of a fish of such quality, haunts, and habits must tend to diminish, or can be maintained only by increased care and legislative aid, in countries where population and industries are great and growing, is sufficiently obvious. The obstacles to the fish performing its natural journeys and functions, the number and efficiency of the instruments of capture, the demand for the product as food, all increase, and all tend to increase the pressure upon the supply beyond the powers of reproduction. Still there have been some serious mistakes in estimating, or rather assuming, the amount as well as the periods of the decline. It has been a good deal forgotten that the excessive plenty of olden times, besides being somewhat more matter of tradition than of evidence, was rather a partial or local than a general or national plenty; and also that in later times the great impoverishment of many of the principal fisheries represented rather a temporary enrichment of other and

newer fisheries than a general decay. That salmon have greatly diminished, are even still diminishing, and ought to be increased, are all truths. What is here sought to be guarded against is merely the deduction that that diminution is to be measured either by the decrease in the yield of some of what used to be the most productive fisheries, or by the facts that formerly salmon were in some places a cheap and abundant commodity, and now are everywhere a costly luxury.

The ease and rapidity with which scarcity can be inflicted on a natural product such as salmon are visible even in the history of regions where the fish is or was incomparably more abundant, and the means and inducements to capture incomparably smaller, than at almost any time or in any district in the United Kingdom. Some of the American rivers, whose salmon supplied food only to a few hundreds of wandering Indians, are reported by recent travellers to have been depopulated, and the supply to have been brought far below the demand, merely by the disregard of seasons, though very slight care and a little well-timed abstinence would have continued and increased a natural supply capable of meeting ten times the demand. There are few regions in the world that had more salmon, and that even yet have fewer men, than Labrador and the northern shores of the lower St. Lawrence ; yet even there it is complained, in most of the recent works regarding British North America, and also in various documents issued by the Canadian Government, that abundance has by neglect and abuse been turned to scarcity. "Thirty years ago," said the Rev. W. Agar Adamson, in a paper read

before the Canadian Institute, "every stream tributary to the St. Lawrence, from Niagara to Labrador on the north side, and to Gaspé Basin on the south side, abounded with salmon. At the present moment, with the exception of a few, there is not one to be found in any river between the Falls of Niagara and the city of Quebec. This deplorable decrease in a natural production of great value has arisen from two causes : *first*, the natural disposition of uncivilized men to destroy at all times and at all seasons whatever has life and is fit for food ; and, *second*, the reluctance of those persons who had constructed mill-dams to attach to them slides." Unfortunately, it is not only "uncivilized men" that possess the propensity which has desolated so many of the rivers of North America—to say nothing of noblemen, country gentlemen, and corporations, operative fishermen, almost everywhere in the United Kingdom, and especially on the "common fisheries" of England and Ireland, are more or less fully possessed with the notion that restrictions as to periods and modes of killing are invasions and injustice, and that the more fish that are killed, the more will remain to be killed. When we see the results even on the St. Lawrence and its tributaries, running through comparative deserts, we need not wonder at the evil results of much greater means of destruction employed on a much more exhaustible field.

Of the fact that from the earliest historical periods down to less than a century ago, salmon abounded to excess in the neighbourhood of English and Irish, and still more of Scottish rivers, accessible to migratory

fish, there is no doubt whatever ; though we would remark, in passing, that this fact must be taken in connexion with the other fact, that from the earliest periods both the English and Scottish legislatures exercised a rigorous, and on the whole a wise care over the fisheries. There were no statistics in the old days, so that if there is any need for proof where there is neither doubt nor denial, we must be content to take it in chance fragments. There is evidence of a considerable export of Scotch salmon (pickled), chiefly to Flanders and France, so early as 1380 ; and a municipal order at Rheims, of that date, contains regulations for its sale. In the time of Richelieu, an obscure Scotchman, of the name of Monteith, from the neighbourhood of Stirling, having presented himself at the French Court, and being asked of what family he was, audaciously answered, “Monteith de Salmonnet ;” and so natural seemed such a designation from a Scotchman that the answer was unsuspectingly accepted, the adventurer was received by the name he had given, and under that name wrote a book in French, which is still extant. Among the oldest statements of what was to be learned of the extent of the salmon-fisheries by travelling in Scotland, are those given about two hundred years ago in the curious book of the Cromwellian trooper, Captain Francks, already mentioned. Francks (from whose descriptions, by the bye, it is clear that the art of salmon-angling was practised then almost precisely as it is now), takes occasion at most of his halting-places to make a short descant on the abundance of the salmon in Scotland. Thus, of Stirling, he writes :—
“The Forth relieves the country with her great plenty

of salmon, where the burgomasters, as in many other parts of Scotland, are compelled to reinforce an ancient Statute, that commands all masters and others not to force or compel any servant, or an apprentice, to feed upon salmon more than thrice a week. . . . The abundance of salmon hereabouts in these parts is hardly to be credited. And the reader, I fancy, will be of my persuasion, when he comes to consider that the price of a salmon formerly exceeded not the value of sixpence sterling." And a hundred years later, the English Engineer Officer, Captain Burt, writing from Inverness, says, that the price of salmon there was a penny a pound, and that "the meanest servants who are not at board wages will not make a meal upon salmon if they can get anything else to eat." In partial corroboration of these statements about the Ness, it may be mentioned that there is a person still living who held a lease of a fishing in that river, under which he was bound to supply the inhabitants of Inverness, during a considerable portion of the year, with salmon at 2d. a pound.

Indeed, till the present century almost every traveller that entered Scotland made the "great plenty of salmon" a subject of remark. Thus Defoe, as soon as he enters the kingdom at Kirkcudbright, writes down: "There is a fine salmon-fishing in this river;" and when he reaches Aberdeen, he says: "The rivers Dee and Don afford salmon in the greatest plenty that can be imagined, to that degree that in some of the summer months the servants won't eat them but twice a week, they are so fat and fulsome; it's almost incredible how they spread; in autumn they engender, and in shallow pools of the river

they cast their spawn, and cover it with sand, and then they are so poor and lean that they are only skin and bone; of that spawn, in the spring, comes a fry of tender little fishes, who make directly to the sea, and, growing to their full progress, return to the river where they were spawned." Defoe wrote this about the same time as Burt wrote; and another traveller, of nearly the same period, describing himself as "A Gentleman," begins his book:—"The salmon-fishery is particularly the delight and the boast of the Scotch, insomuch that for it they too much neglect all the rest." Speaking of Perth, the same writer says:—"The salmon taken here, and all over the Tay, are extremely good, and the quantity prodigious. They convey them to Edinburgh, and to all the towns where they have no salmon, and barrel-up great quantities for exportation." Of Aberdeen:—"The quantity of salmon and perches (?) taken in both rivers is a kind of prodigy; the profits are very considerable, the salmon being sent abroad into different parts of the world, particularly into England, France, the Baltic, and several other places." Of the Ness, he says:—"Here is a great salmon-fishery," and he was more interested than gratified by the sight of the "cruives," then used by the Corporation of the town. These statements—and they might easily be multiplied—are of course good evidences of local plenty, and also of a very considerable export of the fish in a salted state, though it must not be forgotten that at the period when travellers assigned such great commercial importance to our salmon-fisheries they must be held as speaking in some degree by comparison with other industries, which were then insignificant.

As soon as we get into the present century, we read no more of the great abundance and cheapness of salmon. The Rev. James Hall, of London, who wrote, about 1805, *Travels in Scotland by an Unusual Route*, says of Queensferry on the Forth :—“ There is a salmon-fishery near here, which is often extremely productive ; but this species of food is generally too dear to be used by the common people. Our forefathers, who cared little for salmon, and thought it so unwholesome that there was generally a clause inserted in indentures in Scotland, that apprentices should not have salmon set before them above three times a week, were not active in catching them. But matters are the reverse now. Fisheries on the rivers, as well as the sea-coasts of Scotland, are more and more becoming an object of concern ; and nets, boats, and casks, and fishers are almost everywhere to be seen.” The same writer tells a story about two proprietors on the Ythan in Aberdeenshire having been, about fifty years before, joint-proprietors of a right of ferry and a right of fishing, producing about £12 a year each, and one of them successfully proposing to give up his share of the ferry on getting the whole of the fishery—a bargain which, when Hall wrote, had resulted in the owner of the fishery getting £500 or £600 a year, while the owner of the ferry was still getting only the old £12. Hall also mentions that the Duke of Gordon’s (now Duke of Richmond’s) fisheries on the Spey, which had shortly before been let at £1500, were then let on lease at £5000 a year.

The old and familiar story told by Francks, and almost all other travellers, and even in our own days told

somewhere or other almost every week, about apprentices and farm-servants stipulating in their indentures and otherwise not to have to eat salmon above twice a week, must, we suppose, be true, since everybody has always been telling it; but it should be mentioned that no indentures or other written evidence to that effect have ever been seen, and that even the oldest among the writers who give the story, give it as a tale of other days, rather than of their own. The Royal Commissioners of Inquiry into the Salmon Fisheries of England and Wales (1860), met the story almost everywhere, but its evidence nowhere. "We endeavoured," they say in their Report, "to obtain a sight of one of these instruments, but without success, though we met with persons who stated they had seen them; and the universal prevalence of the tradition seems to justify belief in it." Be that as it may, however, there is a fallacy in measuring the difference between former abundance and present scarcity by statements like this, or comparisons between old and present prices. Some people seem to forget that even since the least old of the old times with which comparison has generally been made, the number of mouths has at least trebled, and that consequently, even if this represented, as it does not, the whole increase of consumers, there would necessarily be a comparative scarcity, unless the fish had trebled too. But the mouths have not only trebled, they are incomparably more easily reached. In the old times, though there was a glut at Berwick and Perth, there might be a dearth at London, and probably an entire destitution in Nottingham and Derby. There is a story

(it was told by Burt 130 years ago, and is older even than his time, though applicable also to times long subsequent) of a Highland laird of the last century going to a London hotel with his *gilly*, and, from motives of frugality, ordering a beef-steak for himself, and "salmon for the laddie." On reckoning with his host, he discovered he had to pay a shilling for his own dinner, and a guinea for "the laddie's." The state of matters roughly illustrated by this anecdote, arose chiefly from the manner in which the slowness of conveyance affected a very perishable commodity; but also from the expedient (packing in ice) necessary for keeping the fish in condition even for a few hours, having been a comparatively recent discovery. There was, indeed, as we have seen, a considerable export of pickled salmon from Scotland to several foreign countries. Francks says of the Brora, in Sutherland, "They barrel-up for France and other parts annually as much salmon as amounts to £300 sterling a year." This trade, however, seems almost to have ceased, probably from the fish becoming dearer and scarcer, even before the system of packing the fresh fish in ice opened up a new kind of market. It is necessary, too, in making such comparisons between old and recent periods, to take into consideration two other facts telling in opposite directions. Even after the resort to ice-packing, the slowness and dearness of carriage long continued almost to shut out from the chief markets the more distant or inaccessible of the fisheries, and so to keep up a local cheapness, and delay the equalization of prices. Thus thirty, or even twenty-five years ago, the number of boxes of one cwt.

each sent to London from the Irish fisheries was only 300 or 400 ; ten years ago, it had risen to 3000, and is now above 8000 ; in other words, has increased twenty-fold. On the other hand, it should be noted that recent prices, as ordinarily quoted, do not fully represent the rise of price that has taken place ; for the falling off in the supply has been in the earlier months of the season, when fish are in best condition and at highest value, while there has been rather an increase in the latter months of the season, when the condition of the fish is deteriorated, and the greater number of them consist, not of adult salmon, but of grilse, which bring little more than half the price per pound.

Coming down to later dates, we encounter a new difficulty, rendering the statistics regarding the salmon-fisheries of the rivers not available as data for proving the decline in the total supply—the introduction of fixed engines on the sea-coast, begun about forty years ago, having transferred, without at the first diminishing, the supply. Looking mainly to the Scotch rivers, the fact that, for a considerable number of years after the introduction of fixed engines on the sea-coast, there was no considerable decline of supply on the whole, seems sufficiently established by the fact, that, with a demand certainly not decreasing, prices (subject to the explanation just given) did not materially alter, though many of the older or river fisheries suffered almost immediately a severe impoverishment. Beyond all this lie other difficulties—it is impossible to obtain the statistics of the whole fisheries at former periods, the statistics even of the present period are very imperfect,

and there is great danger of being deluded as to the changes in the amount of produce, by taking figures for localities too small and periods too short to insure any approach to accuracy in the deducing of a total. It is worse than useless to draw inferences from the yield of single fisheries, or even an entire river in a single season, because it often happens that, from the accidents of flood and atmosphere, a good fishery fails in the same year, and sometimes even in the same river, in which even the bad fisheries are doing well, and that sometimes from the same causes the prime of the season will be half-lost to an entire river or district, not from the absence of fish, but from the presence of natural or accidental obstructions to catching them, such as a deficiency of water. The nearest approach to an authentic statement of the amount of the general decline during a more or less well-defined period, is that given in 1860 by the English Commissioners of Inquiry, who state that the evidence as to those rivers of England and Wales where the fish had not been quite extinguished, showed a decline, ranging from nine-tenths to $\frac{1}{10}$ ths, within the memory of living witnesses. This sort of evidence, however, it will be seen, is not much more to be relied on for accuracy than the deductions to be drawn from facts better specified, but too petty, and possibly exceptional. The best plan seems to be to avoid on the one hand data too narrow, and on the other any attempt to grasp a larger mass of facts than can be accurately obtained or easily handled, by taking one or two large rivers or districts, having nothing exceptional in their circumstances, and a period of time sufficiently long to prevent

any confusion of the accidental or temporary with the natural or enduring. In pursuance of this plan, we shall confine ourselves chiefly to Scotland, for several reasons, as, for instance, that it is the chief field of salmon-fishery, both for market and sport; that the statistics of the scattered and long-neglected fisheries of England are, as we have seen, inaccessible; and that those of Ireland, besides being very imperfect, are to be obtained, such as they are, from the Reports of the Irish Fishery Commissioners; while we have found those of Scotland, though not obtainable as a whole, so complete and authentic as to one or two of the principal rivers, that they supply sufficient data for the chief purposes here contemplated. Still more to narrow the ground, we may state generally that, with the single and partial exception of the Tay, to be separately dealt with, the decline in the Scottish fisheries was, till the legislation of the last three or four years, universal and alarming, extending over almost every river and district, from the south-western Doon to the north-eastern Dee; although in one or two cases, such as the Spey and the rivers of Sutherland, where the fisheries are in the hands of one great proprietor, who had resorted to a wise moderation, a great difference for the better was discernible.

Taking first and chiefly the Tweed, one of the principal proprietors of its net-fisheries stated to the House of Commons in 1824, that the rental of the river was then £10,000, had for seven years preceding averaged £12,000, and in 1814 had been £20,000; in six or seven years from the time that evidence was given, the decline of which the witness told brought the rent

to less than a half of what it was when he spoke, and to less than a third of what he had seen it. For the next following twenty-five years, which brings us up to near the beginning of the recent legislation, we are able to give the Tweed rental with precision for each period of five years :

				Rental.
5 years,	1831 to 1835 inclusive,	the average was	£4241	11 1
5 "	1836 to 1840	" "	3840	6 9
5 "	1841 to 1845	" "	4878	6 0
5 "	1846 to 1850	" "	5022	17 1
5 "	1851 to 1855	" "	4588	3 2

And in 1856, the year before Parliament was asked to legislate on what may be called the improved principles now generally adopted, the rent of the Tweed was £4046, 18s. 10d. It would appear, at first sight, that though the decrease from an earlier period had been enormous, there had been no decrease, but rather an increase, during the twenty-five years included in the figures last given. Rent alone, however, is, for obvious reasons, an imperfect or misleading mode of measuring the decay of fisheries, because, as quantity diminishes, the tendency of prices is to rise. Leaving the rent, and coming to deal with the produce, we shall see that that had not only decayed much more than the rental, but that it had been sinking even during those periods when the rental had been rising. In 1804, the number of boxes sent from Berwick was 13,000; in 1816, 11,000; 1818-20, average of 8000. It never afterwards reached 5000, and had at the latest returns, immediately before the recent legislation, sunk to about 3000. But the truth will be more fully brought out by the following figures, which show at a glance not only

the decline in produce during forty-five years, but also, by comparison with the tabulated figures preceding, the degree in which the produce may decline even while the rent rises ; in other words, how much more and sooner the loss falls on the public than on the proprietors. The figures are the condensed essence of a great mass of returns, showing the average annual produce of the Tweed, during each period of five years from 1811 down to 1855 (a year after which, alarm being taken, statistics ceased to be attainable), and require no further preface, even to those least acquainted with salmon nomenclature, than this, that “salmon” means the adult of the *Salmo salar*, whether two or twenty years old, which has ascended and propagated at least once before ; that “grilse” is the same fish in a maiden condition, on its first ascent ; and that “trout” is the *Salmo eriox* of naturalists, a comparatively coarse and low-priced fish, nowhere found in such proportionate abundance as in the Tweed :—

	Salmon.	Grilse.	Trout.
1811 to 1815, .	40,297	68,057	31,235
1816 to 1820, .	37,938	87,089	48,078
1821 to 1825, .	22,930	57,647	62,475
1826 to 1830, .	9,804	53,990	48,864
1831 to 1835, .	14,416	65,112	69,121
1836 to 1840, .	14,149	52,283	54,877
1841 to 1845, .	18,846	81,047	69,712
1846 to 1850, .	11,479	56,190	49,630
1851 to 1855, .	9,085	23,905	32,764

In supplement, we may give separately the actual produce of the season 1855, which is included, of course, in the last of the above quinquennial periods :—

Salmon.	Grilse.	Trout.
6,329	13,952	23,736

And also the take for 1856, which is not included in the table :—

Salmon.	Grilse.	Trout.
4,885	33,992	30,597

For the full understanding and appreciation of the evidence which this Table affords of rapid decay, if not of then approaching extermination, one or two explanations will be useful. Let the reader begin by running his eye down the first or Salmon column. He will see that, reckoning by thousands, it commences with 40 and ends with 9, or, taking the most recent piece of evidence, ends with 6 ; in other words, the *take* of salmon in the Tweed had declined more than five-sixths. Nor does mere decrease of number adequately represent the decay, for the Tweed adult salmon (we speak to a fraction, and by book, although we do not think it necessary to print the book) is, on the average, as compared with a grilse, treble in weight or quantity, and quadruple in value—and, as compared with a trout, quintuple in weight and octuple in value. Further, it must be borne in mind that the adult salmon are the produce of an indefinite number of preceding seasons, representing, in short, all of the salmon kind that have not been killed on their first ascent, or have ever been allowed to breed. Naturally, therefore, this column should exhibit much larger numbers than the column for Grilse, which are all the produce of *one* year ; and quite as naturally, when the number was seen to be not only exceedingly small in itself and in proportion to the number of grilse, but to have diminished five-sixths within fifty years, and more than a half within twenty, and to be still on a hasten-

ing downward movement, a suspicion if not a conviction arose, that such a state of things neither could nor ought to be of long continuance.

The Grilse column presents somewhat different features, having in its earlier stages a hue of prosperity, which, however, proves to have been but the symptom of an undermined constitution. It will be seen that, from the beginning of the period down to about 1845, while the produce in adult salmon was undergoing that rapid decay which continued at least till the new legislation, the produce in grilse was fully maintained, the period 1841-45 being nearly as high as any quinquennial period preceding—indeed the year 1842 was the highest grilse year ever known. But what was the meaning of this prosperity, taken in connexion with a decrease in the number of the adults? In the period 1841-45, the annual average *take* of adult salmon was less than 19,000, while the average of grilse was more than 81,000, and the disproportion is still greater in some of the preceding years. The fact thus appears, that the apparent prosperity in grilse, which prevailed till within the last ten years of the period, had this ominous meaning, that of the whole number of the salmon species killed after having visited the sea (*i.e.*, excluding the innumerable multitudes killed in the infantile or parr and smolt states) nearly four-fifths were, and probably still are, killed before marriage. This process, naturally a very short and sharp one, reached its point of culmination about 1845. The annual average of the produce of grilse in the quinquennial period ending with that year, was, as we have seen, 81,000, having increased between a third

and a half during the same period in which the adult salmon had declined a half or two-thirds, so that, to a great extent, a compensation had been found for the decay of the more valuable fish. But in the next five years the Grilse produce fell a third, to 56,000; in the next and last five years it fell two-thirds, to 23,000; and in the season of 1855 it had reached 13,000, or *less than a sixth of the average of ten years before*. In 1856, it will be observed, the number again rose to about a half of what it had been eight or ten years before; but that symptom of improvement, small and exceptional at the best, is more than counterbalanced by the continued falling off in adult salmon, showing that of the total number of the species killed in the Tweed in that year (the last year of which the statistics have been obtained), nearly six-sevenths were fish that had never bred.

It is curious to find the late Mr. James Wilson, in speaking on these most significant facts, say (*Encyclopædia Britannica*, ix. 608), "There are now as many fish bred as ever; but that they are killed at an earlier age is evident from the great extent to which the slaughter of grilse now exceeds that of salmon." We should say that when the proportion slaughtered of fish that had never bred at all had been greatly increased, and when the number of fish that had bred had diminished by three-fourths,—when the proportional mortality had enormously increased among single people, and when there was only one married person where there used to be five,—it was exceedingly difficult to understand how there could be as many fish bred as ever, or how we were to avoid the

conclusion that a great decay had taken place in the work of populating the waters. On the Grilse figures as they stand, we here only make one further remark, that the decrease during the last ten years of the period was not merely evidence of the rapid exhaustion of the crop, but a pretty clear indication of the average duration of salmon life having been greatly reduced by an increase in the efficiency or severity of the fishing.

The Trout column, though affected by different causes, bears on the surface a considerable resemblance to that of Grilse, inasmuch as it shows an increase up to about 1845, and a rapid decline throughout the ten years following. It is curious to observe, that while, at the period with which the Table commences, the number of Salmon exceeded that of Trouts by a fourth, we find, on coming to the period of 1841-45, that by the twofold operation of the Salmon having diminished by more than a half, and the Trout having more than doubled, the position of the two sorts was more than reversed, the trouts outnumbering the salmon as four to one. This increase in trouts has, with much appearance of reason, been ascribed in great part to the fact that standing-nets upon the sea-shore take a comparatively small *proportion* of trouts, owing to the marine habits of that fish differing somewhat from that of the salmon and grilse, a point with which we shall deal more particularly when we come to speak of fixed engines. This fact may in great part account for the capture of trouts having increased during a large portion of the period in which the salmon, peculiarly the victims of the sea-shore fixed nets, were

decreasing. But how are we to account for the fact, that during the last ten years of the period the trouts decreased more than a half on the average, and according to the latest year, two-thirds? We see no explanation but in the inference that not only the fixed nets, which took chiefly salmon, but also those within the river, which took more trout than salmon, were fished with an improvident mercilessness.

Estimated by weight, it may be mentioned that, compared with the earlier period, the falling off in the annual produce of the Tweed fisheries, just previous to the recent legislation, amounted to something like 200,000 pounds, as entirely and as needlessly lost as if it had been thrown into the sea or upon the dunghill.

To see at a glance the difference of symptoms in a diseased river and in a healthy river, in a river greedily fished and a river providently fished, compare the Table regarding the Tweed, with the following, showing the produce of the Duke of Richmond's fisheries on the Spey, in the years named :—

	Salmon.	Grilse.	Trouts.
1851, . .	6,515	33,285	8,660
1852, . .	10,980	46,041	8,549
1853, . .	15,772	58,166	16,675
1854, . .	29,780	36,148	16,025
1855, . .	13,194	48,740	9,660
1856, . .	14,103	27,528	8,118
1857, . .	13,466	54,949	31,473
1858, . .	30,840	35,409	15,313
1859, . .	23,608	17,263	5,853

It would not be of much practical value to enter on comparisons between the Tweed tables and the Spey

tables as to the columns for "Trouts" (*Salmo eriox*), because the vast difference in that respect between the two rivers is a difference established by nature. But there is great significance in the other columns. While in the Tweed the proportion netted of the grilse or adolescent salmon to the adult salmon is four or five to one, on the Spey it is little more than double. The explanation of which is, that, in the years named, the Spey, besides having been relieved from fixed nets, was fished only to the middle of August; while the Tweed, besides having fixed nets at its mouth, was fished to the middle of October. In passing, let us add, though the fact scarcely belongs to the question more immediately in hand, that the Tweed fisheries, as compared with the Duke of Richmond's, while taking nearly double the fish of all kinds, yield less than half the rent or profit.

An apparent, and to some extent real exception to the rule of general decline, previous to the recent legislation, was exhibited by the river *and firth* of Tay taken together. The difference between the Tay and other fishing districts in Scotland, consisted chiefly in this, that nine or ten years ago the *rental* of the Tay was not greatly less than it had been twenty or thirty years before, though within that period it had once or twice suffered great decline. But besides that rental is an imperfect test, there were several special favouring or saving circumstances in the case of the Tay, of which it might perhaps be sufficient to mention merely one,—the Tay proprietors for a considerable period anticipated by voluntary agreement the improved legislation to which they ultimately became subject. Again, during

the period at the end of which the rental of the Tay had not materially decreased, the price of the fish had very greatly advanced, from which the inference is, that the produce must have fallen off in proportion as the price rose. On this point, however, we cannot get beyond an inference, the returns of the produce of Tay extending only to 1844, till which period they were made under compulsion of a local act, and since which they have been kept secret by the lessees, who are numerous, divided, and jealous. From such facts as we have, we learn, 1st, that the proportion of captured grilse to salmon had been greatly and gradually increasing, though it had not attained to anything like the results in the case of the Tweed; and, 2d, that though the Tay fisheries as a whole did not materially decrease in money value, the upper net-fisheries, situated immediately above the tide, fell off so rapidly that their rental, which was formerly £3000, sank to £650. The signification of these two facts, and especially of the last, is simply this, that the fishing in the lower or tidal parts of the river had so increased in effectiveness that a Tay salmon's life had been reduced by many months, and his road to destruction shortened by many miles. But how are we to account for these results being so much less in degree in the Tay than elsewhere, and especially in the Tay's sister and rival, the Tweed? By way of explanation, we would suggest, first, that the number of fish killed in the Tay, though perhaps as great positively as that killed in Tweed, is smaller *in proportion to the number existing*; and second, that the breeding-fish and the young on the Tay have been very much better protected. On the first

point we speak with doubt and reservation, as being one which purely "practical men" will claim as exclusively their own. But any man may see that, for thirty miles upwards from the sea, the Tay is a mixture of firth and river, running over a broad and varying channel, where the route of the fish, we might surmise, can neither be certainly known nor entirely commanded, and that, immediately above the tide, the river gets so rapid and rough-bottomed as, except at a few spots, to be unavailable for net-fishing. And on the other hand, we see that, within a very few yards upwards from the ocean, the Tweed is a comparatively narrow and shallow river (it is fordable at little more than a stone-cast from the shipping at Berwick quay), with a well-defined and smooth-bottomed channel, so that the fish comes at once within reach and even sight of his human or inhuman enemy.

The second point can be spoken to more positively. There can be no doubt that the habits of the Tay salmon, whether natural or constrained, and the character of the human population among whom they sojourn, preserve them to a very great extent from those perils which prove so fatal to their brethren and sisters of the Tweed. The Tay fish, for the most part, confine their travels and their breeding operations to the comparatively short stream of the main river, between Perth and Loch Tay (about forty miles), where they are well protected by nature and by man; while the Tweed salmon extend their movements over the whole hundred miles of the main river, and over at least as many miles of the tributaries and sub-tributaries, where nature leaves

them and their eggs exposed to innumerable dangers, and where no man is able, and very few men are willing, to extend protection, or even refrain from destruction. It is reasonable to suppose that the more aspiring and daring habits of the Tweed salmon are at least in great part natural and voluntary, for there are very remarkable differences between the habits of the salmon of different rivers as to the length of their time and their journey in fresh water, before they assume, so to speak, the manners and customs of their new element. Thus the salmon of the Ness, and scarcely less of the Spey, the Tay, and other rivers, are many of them content to choose their fresh-water haunts immediately above the tide, and to begin the very day of their arrival to do as fish in rivers ought to do, including the taking of the angler's lure; but a Tweed salmon, though at low tide he is in fresh water as soon as he doubles the pier of Berwick, and can run out of all tidal influences in half an hour, will not, except under circumstances of dire necessity, take a day's or an hour's lodging, still less any refreshment in the shape of a bunch of feathers and barbed steel, until he is at least twelve, and scarcely indeed till he is twenty miles on his upward journey. It considerably helps out this explanation to add, that the natural course of the two rivers tends to the same result: owing to the steepness of the land, few of the tributaries of the Tay are available for salmon, and almost the only, though quite a sufficient spawning-ground is the main river, which issues almost full-grown from the parent lake; while the Tweed, in its course through five counties, and (with the single exception of

the Gala, choked at the mouth by a woollen mill) all its tributaries and their innumerable "burns," are accessible to every fish of ordinary enterprise and energy.

This would be no harm, but for another difference—the fish in Tay are befriended by the inhabitants; the fish in Tweed have always been regarded as fair, though unlawful spoil. Although the Tay fishery proprietors pay only six per cent. of their rental for protection, the killing of fish in close-time is almost unknown; although the Tweed proprietors have long paid at least 20 per cent. of their rental, hundreds of men used to employ themselves in slaughtering the breeders every suitable night from November to March. The explanation of this is, that the owners and other residents near the spawning-grounds of the Tay were and are both able and willing to protect the fish, and that those in the Tweed were neither. It is comparatively easy for Taysian potentates like the Duke of Atholl and the Earl of Breadalbane—who are monarchs of much more than all they survey, and lords of the fish not less than of "the fowl and the brute"—to deter from water-poaching a population mainly their own dependants; but even the Duke of Buccleuch has but small influence with the weavers of Hawick, Selkirk, and Galashiels, who retain very much of the spirit and propensities of their ancestors, the Border "reivers." But especially, while the Duke of Atholl and Lord Breadalbane were in reality protecting their own interests, the Duke of Buccleuch (whom we only take as the readiest instance that comes) was in similar circumstances to those indicated by the poet Thomson, when

asked why he did not get out of bed till dinner-time—his Grace had “nae motive.” Though the largest proprietor in the district intersected by the Tweed and its tributaries, he could not, under the late laws, nor probably even yet, kill a dozen or a score of fish in a season upon his whole property. And here, as at others of the turning-points in the inquiry, we come in sight of a truth which, even in the most recent and improved legislation, has been too much overlooked, that the law should have respect to the widely-varying natural circumstances of rivers.

Whilst thus pointing out, however, the natural circumstances which helped to save the rental, though not the produce, of the Tay from any very great decrease, we have been working supererogatorily as to the main point at present in hand—that, if the salmon-fisheries are now in process of recovery, they had been suffering a long and disastrous decline up till the legislation of these two or three years past. In 1828 (*i.e.*, just before the coming into operation of the disastrous Act which lengthened the fishing season all over Scotland), the rental of the Tay was £14,000 ; in 1836, it had fallen to £10,150 ; and in 1852, £7973 was all that remained. So far, we see that, under the laws and management we are arraigning, the Tay, in spite of some favouring special circumstances, suffered pretty much like its neighbours ; and it is only so far that the Tay was managed like its neighbours. About 1852, the Tay proprietors saw that the law was a mistake ; that it was trying to take out of the goose that laid their golden eggs more than was in her ; and they resolved among

themselves (with the exception of two or three of the smaller proprietors) to stop fishing, as formerly, on the 26th of August, though leaving rod-fishing to continue till 14th September. This voluntary reform or suspension of the law continued, with improving fisheries and rising rents, till 1855, when one of the upper proprietors broke up the agreement, on the ground that the recusancy of some of the lowest proprietors was still persisted in. The law of 1828 then resumed its sway, and the decline, arrested by the suspension of the law, resumed also. In 1858, the great majority of the proprietors united in going to Parliament for a local Act, and obtained one, stopping the net-fishing on the 26th August, and extending the privileges of the rod-fisheries. Immediately, the rent once more began to rise—having been less than £8000 when the former law was in operation, it rose to nearly £13,000 in 1859, and is now above £15,000. Thus, when looked at below the surface, even the apparently exceptional case of the Tay goes to prove the fact of an enormous decrease having taken place in the annual supply of salmon, and, moreover, the facts that that decrease was caused mainly by bad laws, and can be to a large extent cured by good.

Having seen, as closely and as precisely as the scarcity of materials will permit, and as is necessary for present purposes, what have been the periods and what the extent of the decrease, we come next to the *causes* actual and alleged, and after that shall come to the *cures* attempted and desirable. For it is a notable feature in the question, that, to a great extent, the cures do not consist in the removal of the causes. Some of the

causes are irremovable ; while, on the other hand, there are practicable and efficient cures quite independent of the causes.

One and the chief of irremovable causes is *the increase of land drainage*. Salmon do not incline to enter, nor even though they may have entered to ascend, a river, either when it is in high flood, "roaring from bank to brae," nor when it is dwindled and limpid, but when it is between these two conditions, subsiding, and in some degree clarifying. Now, the effect of increased drainage—by which we refer, not so much to the drains of the arable districts as to the open "sheep drains" of the pastoral districts at the water sources—is to bring down the water more quickly, and in greater volume, and then to carry it seaward with greater rapidity ; thus making addition to the two extreme conditions of water in which fish do not incline to travel, and making deduction from that happy medium which is their choice, and which is now, like Lear's wit, "pared o' both sides till little is left in the middle." Taking Scotland generally, the average of the statements as to the decrease in the period of what is called the "travelling condition" may be taken at one-half ;—on the Tweed it has been considerably more. One consequence of this change is, that the fish are kept longer hanging about the mouths of the rivers, where, besides the numbers taken in the stake and bag nets, they fall a prey to their natural marine enemies ; and also, we would suggest, are likely, after repeated failures in getting up the river, to dwindle and die—in the same way that they are known to do in the converse case of being prevented,

at their appointed season, from getting down again to the sea. It is obvious also, that the changes caused by drainage must tend to an increase in the destruction of ova—the greater suddenness and violence of the flood washing the spawn away when in process of deposition, or even after its being covered; the greater height of the flooded water tempting the spawning fish (which always seeks the shallows) to deposit its ova in higher and therefore more exposed positions; and the lower and more rapid subsidence of the waters increasing such perils as desiccation and frost. Except the Inspecting Commissioners of Fisheries for Ireland, who some years ago spoke hopefully of the “expected increase of drainage, with its consequent facilities for migration!” no man doubts that what has here been stated is accurate to a greater or less extent; and the more a man inquires and watches, the more will he tend towards the conclusion, that this cause of decrease, whilst it is unfortunately irremovable, is also very considerable.

It may be said, and indeed has been said, in Parliamentary Committees and elsewhere, that diminution from such a cause does not give the owners of fisheries any claim to popular sympathy or legislative aid, because it has been in improving their land that they have deteriorated their waters. But, in the first place, it is not chiefly the fishery-owners, but the public, that have lost; and it would be no reasonable objection to benefiting the public, at no expense to anybody whatever, that you do so through more especially benefiting certain persons or classes. In the second place, it is not the drainage of the land having immediate frontage to the river that

has produced these results, but the drainage of all the land in the country, and in the chief degree the land in high-lying districts at the sources of the rivulets or burns, in almost none of which are there any salmon, and in none any ownership of salmon-fisheries. In the third place, the owners of salmon-fisheries, in Scotland at least, are not ordinarily, and are never necessarily, the owners also of land, either close on the river or elsewhere; salmon-fisheries in Scotland, as already stated, not being an appurtenance of the land, but a separate property, of course with separate management and interests.

The next cause of decrease requiring mention is one which has been too readily assumed to be irremovable,—*obstructions and pollutions* consequent on the rise of population and industry on the banks of rivers. The existence and extent of this cause need no detailed proof, for wherever it gets fairly or unfairly into full operation, it soon results, not in mere decay, but in extermination, which everybody can see, and nobody can deny. Multitudes of rivers in England have been long ago utterly depopulated (the Thames among them); others (such as the Tyne) reduced to shadows of their former selves; and even in Scotland there have already been extermination in some rivers, vast injury in others, and in all rivers not already past praying for, threats of further evil, every day increasing in magnitude and imminence. The chief case of entire extinction in Scotland is that of the Clyde, in prophetic allusion to which, perhaps, it is that the heraldic arms of the city of Glasgow comprise a salmon, with a ring in its nose, and literally “up a tree.” The South Esk, in Forfarshire, is also stated

to be hastening to the same end from similar causes. That part of the evil which consists in obstructions can be easily removed, or at least greatly alleviated. That which consists of pollution is more difficult to deal with, but it demands and must very soon receive abatement, on considerations even more important than the preservation of salmon, though that may seem to be a strong expression.

The *killing of spawning fish* in close-time has been and is a great cause of decrease, but it can scarcely be regarded as a cause of the decrease within the dates at which we are now chiefly looking. This destructive practice is not new and increasing, but old and diminishing; and it is plain that we cannot ascribe an increased and increasing effect to a diminished and diminishing cause. But, though this practice cannot account for the decrease in the number of fish compared with former periods, it is no less true that it is a great evil, the suppression of which would bring about an improvement on our present returns. It is, indeed, to the diminution of this practice of late years that we chiefly ascribe the fact of the supply of grilse or young fish having been so well maintained during the last twenty-five or thirty-five years, in spite of the increased severity of the fishing, shown by the rapidly diminishing number of the fish which are allowed to come to the adult stage.

Another cause of decrease has been the brevity or mistiming of the *close season*. Up to 1858 there were three different close seasons in Scotland—for the Solway (with several differences for the different rivers emptying

themselves into that firth) ; for the Tweed ; and for the rivers north of Tweed. There is no reasonable doubt that in all these cases the fishing was (at least as to Scotland generally, in the period subsequent to 1828, when an Act, known as Home Drummond's Act, was passed, shifting the beginning of the close season from the 26th of August to the 14th of September) allowed to continue too long or too late. The river that was fished longest and latest was the Tweed (till 14th October), and it showed by far the greatest and most rapid decline. There is as little doubt that the application of the same rules regarding season to rivers differing very widely from each other in their natural circumstances, and in the habits of their fish, was a most pernicious mistake. As a Highland laird very aptly expressed it, thirty years ago, to a Parliamentary Committee, "To prohibit early rivers from beginning till late ones are ready, is as sensible a plan as it would be to prohibit the farmers of England from cutting their crops till the harvest was ready in the Highlands." We do not mean, and are not of opinion, that there is much difference between rivers as to the end of the season—the season at which a greater or less proportion of the fish begin to get gravid and out of condition. The reference is to the beginning of the season ; for there are very great differences between rivers regarding the periods in late winter or early spring at which they contain *clean* fish in quantities sufficient to render fishing profitable, and have got rid in any considerable degree of the foul fish, spawned and unspawned. To speak of "early rivers" and "late rivers" is a mistake, if the allusion is to the

earliness or lateness at which the fish begin to spawn ; if the reference is to the earliness or lateness of the period at which fishing can be profitably and providently begun, a more accurate description would be "short-seasoned" and "long-seasoned." There is another sense, too, in which these epithets would apply ; rivers differ greatly in the length of their spawning seasons, as well as of their proper fishing seasons—those which are late in getting a supply of clean fish in the beginning of the legal fishing season being generally late also as to the end, though not as to the beginning, of the spawning season. In Tweed, for instance, the spawning begins about the same time as in other rivers, but continues much longer. For these differences several causes could be suggested : such as differences in the distances of the spawning-beds from the sea, and in the amount of natural obstacles to ascent ; but it is enough for present purposes to know that such is the fact, and that it is a fact which has received but little attention in the making of laws, either old or new. At the same time, there are some considerable practical difficulties in the way of having a close-time varied for various rivers ; and the main facts that great evil has been caused by too long and too late fishing, and that there has been a want of variety as to legal seasons, have been to some extent acknowledged by the recent Acts, which shorten the fishing season as a whole, and give the Commissioners very considerable power as to varying the period of opening or closing. Theoretically, indeed, the close times of the English rivers had been from old times endlessly varied under local Acts, and under a general Act giving cer-

tain powers regarding seasons to the Quarter Sessions—powers, however, which, mainly from ignorance and carelessness, if also from selfishness, were greatly abused. In almost all cases also, the English fishing was too long and too late, and the imperfections of the law were greatly aggravated by its being almost universally disregarded. For more than twenty years, Ireland has been more favourably situated in this respect than the other two kingdoms, having, under the Act of 1842, had its seasons both much shortened and judiciously varied by the Commissioners, the benefit of which arrangements proved almost sufficient to counterbalance the evils wrought by other causes.

We come now, however, to the grand cause of the general decrease, which is partly included in the cause just dealt with, but may be roundly expressed by the term *over-fishing*. This over-fishing has been of two kinds, and to some extent of two dates. In the first place, by the old and ordinary mode of net-and-coble, in the lower or nettable portions of rivers, which brought about the earlier of two declensions; next, by the comparatively new mode of stake and bag nets on the coast, which, co-operating with the continued overworking of the former system, has mainly produced the more recent decline.

First, as to the diminution caused through the over-fishing by the old or ordinary modes. That the efficiency or severity of the fishing would increase as the demand and the prices rose with the advance in population and means of transport, was to be expected. One piece of evidence that the work was overdone—that the killing

was going far ahead of the breeding—before any blame could be imputed to fixed or standing nets, will be found in whatever portion of the Tweed statistics given above is of older date than 1824. And the facts from Tweed we have found to correspond with those from other rivers.

Statements which it may be necessary to touch in passing, have been put forth to the effect that the net-fishing within the Tweed was not so severe nine or ten years ago as it had been twenty or thirty years before ; that is, before the period of the general decline. That fact, however, does not necessarily mean more than that the cause preceded the effect. Then, if some stations were abandoned, it still remained true that every station that would pay was still fished to the utmost, and that, owing to the rise in price, the number of fish that made a paying station was much smaller than formerly. Moreover, is there not a good deal in the fact that all but one or two of the lower fisheries of the Tweed are now in the hands of the same lessees, and that, where fish can be got at any of several stations, they work only what stations seem necessary, and do not set their right hand to compete with their left ?

Some peculiar circumstances in the history of the Tay furnish us with demonstrative evidence of the serious consequences of an increase in the frequency or efficiency of net-and-coble fishing. About 1835, there came into operation an Act, called the Tay Navigation Act, one effect of which was, by the removal of obstructions, to give, on the whole, increased facilities for the working of the nets on the fisheries within tideway. The following

abstract of a return regarding the fisheries of two proprietors, generally reckoned as possessing one-half of the entire fisheries of the tideway, show the result:—

TEN YEARS (1825-34) *before* NAVIGATION ACT.

	Salmon.	Grilse.
Greatest year, . . .	9,731	18,071
Smallest year, . . .	3,920	8,622
Total of the ten years, .	67,151	128,188
Annual average, . . .	6,715	12,818

TEN YEARS (1836-45) *after* NAVIGATION ACT.

	Salmon.	Grilse.
Greatest year, . . .	12,123	24,603
Smallest year, . . .	4,704	8,070
Total of the ten years, .	85,899	133,346
Annual average, . . .	8,589	13,335

So far so well. But take the fishings just next above those; which, from being beyond the tideway, and above Perth Bridge, did not partake in the benefits of the Navigation Act. In the same period during which the two tideway fisheries, by their improved working, had increased as the Table shows, their neighbours next above had suffered a decrease of nearly fifty per cent. ! This shows what increased efficiency in the use of the net-and-coble *can* do, and indicates what it actually did, without aid from the fixed nets, in decreasing the number of fish previously permitted to ascend and breed.

In coming to the second species of over-fishing,—fishing by fixed or standing-nets,—we come to the chief culprit; and have got evidence against him both curious and conclusive.

Fishing by stake and bag nets (the former being a species of net hung on stakes driven into the beach, with the cells or traps a little beyond low water, and the

latter being a species kept stationary by anchorage, and ordinarily reaching some hundreds of feet beyond low water) is an invention only about thirty or forty years old, as regards at least the places in Scotland where it is now practised ; while, as regards England and Ireland, it is of still more recent date. It is not only novel, it may be said to exist only through the omission or ignorance of the Legislature. The chief aim of legislation on the subject, both in England and Scotland, from Magna Charta downwards, has been to prevent the raising of "standing-gear" in "the run of the fish ;" but this prohibition did not extend to the sea-coast, partly, perhaps, because that was not then known to be "the run of the fish," and partly because no sort of engine had at that time been invented capable of standing and acting effectively in the open sea. It has since, however, been discovered,—and most diligently has the discovery been put to use,—that the sea-coast is almost as much the course of the fish as is the channel of the river or estuary. The salmon returning to the fresh water does not lie off in mid-ocean, and then, as with a needle and compass, steer right into the river's mouth. It feels, or, as Sir Humphry Davy expressed it to the Committee of 1824, *scent*s its way along the shore for many miles. The distance from the river of which they are in search, or from any river, at which salmon begin, in nautical phrase, to "hug the shore," is greater than seems generally believed, even by those who have paid some attention to the subject. A sail along almost any portion of the coast of Scotland—say that long stretch from Buchanness to Fortrose—will show that the shore is draped with

salmon-nets, with very little regard to the neighbourhood or distance of a river. To take a single illustration, we see in our mind's eye (but of course we speak of an actual case) a line of coast running out into a bold promontory, then trending inwards to form a bay five miles indented. In the inmost corner of that bay stands a productive stake-net fishery, although there is at the place no run of fresh water which would afford passage to a minnow, and no salmon river debouches within sixty miles. Here (and the fact is one of a multitude) it is proved that even in the absence of any contiguous river, the salmon not only keep the shore, but follow its deepest and most sinuous indentations. The fact was tardily and partially recognised by the Legislature in the Act (7 and 8 Victoria, cap. 95) which prohibits any but the proprietor of the fishery from taking salmon "in any part of the sea within a mile of low-water mark, in Scotland." This recognises the fact of the fish following the shore, but leaves unrestrained the misdoings or (what in this case is the same thing), the over-doings, of those who have taken such merciless advantage of the privilege they (we may say) accidentally possess.

In proving the destructiveness of fixed nets, we shall confine ourselves chiefly to two pieces of evidence, differing, as will be seen, in their character, but both leading clearly to conviction. Owing to legal doubts as to the precise nature of the localities in which standing-engines were prohibited by the old Scotch Statutes, fixed nets were erected in the Firth of the Tay in 1799, and, after much litigation, were finally declared illegal in 1812. The following figures—being an abstract of returns for

two fisheries forming in value a half of the whole Tay, and situated immediately *above* the highest of the fixed-net fisheries—tell their own story very forcibly :—

TEN YEARS (1788-97) *before* STAKE-NETS.

	Salmon.	Grilse.
Greatest year, . . .	18,069	3,396
Smallest year, . . .	7,372	586
Total of the ten years, . . .	108,747	22,107
Annual average, . . .	10,874	2,211

TEN YEARS (1801-10) *during* STAKE-NETS.

	Salmon.	Grilse.
Greatest year, . . .	14,845	4,756
Smallest year, . . .	4,003	1,390
Total of the ten years, . . .	66,990	24,300
Annual average, . . .	6,700	2,429

TEN YEARS (1815-24) *after* STAKE-NETS.

	Salmon.	Grilse.
Greatest year, . . .	22,495	16,755
Smallest year, . . .	6,266	6,142
Total of the ten years, . . .	113,168	112,204
Annual average, . . .	11,316	11,220

These facts speak for themselves, or rather against themselves. The number of salmon taken at these two stations, forming, as we have said, one-half in value of the whole fisheries of the Tay, was reduced one-third by the erection of stake-nets at the neighbouring fisheries, and again reached and greatly overpassed its former amount on their removal. The rent, it need hardly be observed, altered accordingly. In addition, we may mention that the number of boxes (each box containing about 100 pounds of fish) shipped from the river-fisheries of the Tay in 1812, the last year of the stake-nets, was

1175 ; in 1819, after they had been completely removed, 5694.

It may be said, that these were stake-nets in an illegal position, and therefore not furnishing a fair criterion. Without leaving the same river, we can adduce other facts not open to this cavil. After the suppression of the nets in the estuary of Tay, in 1812, they began to be erected on the open or ocean-coast of Forfarshire about 1821, and were in effective numbers about 1825. With what result ? On the two extensive fisheries which we have been using for data, the take fell nearly half in the ten years following, sinking to a very little more than the amount to which it had been reduced during the operation of the stake-nets *in* the river. The number of salmon taken annually at one of those two fisheries had never been less than 10,000 for four years previous to the erection of the fixed nets on the coast ; it never once reached that number in the thirty years that followed. And, notwithstanding the increased productiveness of a portion of the net-and-coble fisheries occasioned by the Tay Navigation Act (as shown above), the total river rental was, until legislative remedy came at another point, one-fourth less than it was before the erection of the stake-nets twenty or forty miles off on the sea-shore. These facts go a long way to establish that fixtures on the shores are not much less effectively in the run of the fish than fixtures in the rivers. And we have even less exceptionable evidence to the same effect.

A local bill, called the Tweed Act, passed in 1830, prohibited all "bar-nets" within five miles south, and four miles north of the river, which has the peculiarity

of having no estuary, but changing at once from river to ocean. Passing over some attempts to erect fixed nets within these limits, by taking advantage of the looseness of the phrase "bar-nets," we go on to state that during the period of years of which we have chiefly spoken, there were not any fixed nets in the Tweed district, except beyond the limits mentioned. Yet the number of salmon and grilse taken in two small clusters of nets, occupying only a few yards of beach, and removed along the open shore of the German Ocean five miles from the river, and from any run of water or indentation of coast indicating its neighbourhood, used to be nearly one-half of the whole number taken in Tweed!

It will be observed that our statement regarding these fixed nets on the Tweed coast omits mention of trouts (*Salmo eriox*)—and thereby hangs a strange, but, on examination, significant fact. On an average of twenty years, the number of trout taken annually in the river was about equal to the take of grilse, and about four times the take of salmon: in these coast-nets, on the contrary, the take of trout used to reach only about a ninth of the take of grilse, and a fourth of the take of salmon. In other words, the net-and-coble took three or four trouts for every salmon, while the fixed nets took three or four salmon and nine or ten grilses for one trout. The local fishermen explain the disparity by a difference in the habits or instincts of the two species of fish. The salmon or grilse, when he strikes the leader of the standing-net, follows it out into the trap or chambers; the trout—whether it is that he is naturally more acute, or that, though of smaller size, he is ordinarily of

greater age, and therefore of more knowledge of the world, even the fishermen cannot tell—flies, not *along* the leader, but *back* from it, and so greatly increases his chances of escape. Now, look at the above Table of the produce of the Tweed from 1811 downwards, and it will be seen that the average proportion of trouts to salmon, during the earliest quinquennial period comprised in it, was as three to four; in the later quinquennial period, as four to one! In the first year included in the return (which we have ascertained to have shown the same proportions as several years preceding it), we see 38,500 salmon to 12,400 trouts, or more than three salmon to one trout: in 1856, 30,597 trouts to 4885 salmon, or more than six trouts to one salmon! This immense change in the proportion between the kind of fish that the fixed nets spare, and the kind that they capture, is of obvious significancy.

In further illustration of this curious fact, we are enabled to state with precision the proportion of all the three divisions of the salmon kind taken in different descriptions of nets in and near the Tweed, on the average of the last four years in the above table. For every 100 salmon, the stake and bag nets five miles from the river took 234 grilse and only 30 trouts; the fisheries on the sea-shore close to the river mouth, for every 100 salmon took 293 grilse and 99 trouts; but on entering the river, the proportion up to Berwick Bridge was to every 100 salmon 378 grilse and 451 trouts. In other words, the shore-nets took more than three salmon for every trout; the nets within the river took four and a half trouts for every salmon.

There are plenty of proofs to the same effect ; since the erection of fixed engines on the coasts of Aberdeen and Kincardine, the annual value of the produce of the rivers Dee and Don has sunk by £18,000 ; and under the operation of similar causes in the Moray Firth, the produce of the Beaully sank two-thirds, and of the Ness, three-fourths.

What of that, it may be said, as to the question of the total supply provided for the public ? Some proprietors may have greatly gained to the loss of others, but the public are no worse. But that is only part of the story ; the supply to the public has *not* been increased, but has been greatly decreased, it being of the nature of these wasteful engines to tend fast to self-destruction, after and sometimes before having destroyed their neighbours. When there were fixed nets on the fisheries of the Duke of Richmond at the mouth of the Spey, he could not get £6000 of rent for all his fisheries ; he put down the fixtures, and now gets £13,000. Or take the north-west coast of Sutherland. Bag-nets were introduced there about thirty years ago ; for the first half of the period during which they lasted they prospered splendidly ; during the latter half, they fell away to worthlessness. In the season of 1839 they produced upwards of 16,000 salmon ; in the season of 1850, although the number of bag-nets on the same extent of coast had been doubled, they produced only 1300 : in other words, they sunk to a twelfth, or, allowing for the engines of capture having been doubled in number, to a twenty-fourth. These nets, which paid an annual rent of £900 to the Duke of Sutherland, were then entirely

abandoned. The fixed-net fisheries on the firths of Moray and Beaully, which more than half exhausted the rivers there emptying themselves, are now, some of them, given up as unprofitable, and others dwindled to a trifle, partly from having been "fished out" by new fixtures farther seaward, partly from the general decline in the number of fish, caused by over-fishing.

The same story has to be told of the effect of stake and bag nets in England and Ireland, though in both these countries those engines are of more recent introduction than even in Scotland. In Ireland the effects were so rapid and visible as to produce both popular tumults and ultimately something that comes pretty near to legislative prohibition. The reports of the English Inspectors of Salmon-Fisheries are full of statements of the mischief wrought by these devices ; for instance, in their Second Report (1863), they say of a fishery on the Esk in Cumberland :—" Before stake-nets were introduced it was let for £300, but with their increase its value diminished ; in 1840 it let for £100, and its rent varied from that sum to £70, and last year it was let at £50 only." Still stronger instances of the same kind might have been adduced from the same district. The Solway, on its Scotch shore, is (as we shall have occasion to mention more fully hereafter) the birthplace of that kind of stake-net that was afterwards found capable of being made to stand and work upon the open sea-shore ; and the Solway also affords the most conclusive evidence, not only of the unfair, but of the ultimately self-destructive operations of these engines. The first stake-net on the Solway—*i.e.*, the first fixed net with leaders and cham-

bers—was erected at a place called Newby, a short distance west of the mouth of the Annan, in 1788. Up till that time, the rent of the Newby fishery had been only £16, whilst the rents of the fisheries farther up the firth amounted to several hundreds of pounds. In a few years the rent of the Newby fishery, formerly £16, was £2000! whilst its upper neighbours sank to a mere fraction of their former value. Here was a great transfer of property, and then came a great destruction of property. The Newby example was copied; the firth was over-fished; the rent of Newby is now little more than a tenth of what it was; and its neighbours, though they did not participate in its prosperity, have shared in its decay; for instance, a fishery which used to yield the Corporation of Carlisle a rent of £722 when salmon sold at 2d. a pound, now yields a rent of only £55 when salmon sell at as many shillings a pound. In a word, the “improved engines” have not only reduced the total produce of the firth and its rivers, but have reduced the total money value far below the amount at which it stood when ten tons of the produce brought no more money than one ton brings now.

The evidence from all parts of England laid before the English Commissioners of Inquiry (1860) was so strong that they reported: “We are prepared, after a full consideration of the case, to recommend the total suppression by law of all fixed engines;” and in the same year a Committee of the House of Lords, appointed in the interest and on the instigation of the owners of fixed engines, also reported in favour of abolition.

It will be seen at a glance that this comparatively

novel mode of fishing operates powerfully as a transfer of fishing property ; but for the present purpose what is required to be noted is, that it causes a great increase of fishing, which tends to produce, and has long ago produced, a great decrease of fish. What these new or additional fisheries kill, or rather did kill before they succeeded in half eating up themselves as well as their neighbours, was not merely the fish which the older fisheries lost, but all these and for some time a great many besides. These nets were a clear addition to the means of destruction ; and while they left fewer fish to be destroyed by the formerly existing means, they left also fewer to live for the purpose of multiplying and replenishing the waters.

There is another mode besides over-killing in which fixed engines work evil, of which we have said but little, not because it is unimportant, but because it does not admit of positive evidence. We can count how many fish they kill, but we cannot see how many they frighten back and out, to become the prey of seals and porpoises. "These engines," said the English Commissioners of Inquiry, "are baneful to the fisheries, not only on account of the number of fish which they destroy, but also because they scare and drive them away to sea, when they come in shoals seeking the rivers, thereby exposing them to be injured or destroyed in a variety of ways." The fact here set forth is recognised in all the old legislation, which prohibits fixtures in the rivers and estuaries, on account not so much of their success in capturing, as of their effect in deterring and frightening ; any "white object," though incapable of anything but scaring, being

prohibited equally with engines of capture. If objects in an estuary, striking merely the eye of a salmon, frighten him back to the sea, a similar effect is more than likely to follow from his running against miles of posts and nets whenever he tries to take his natural course along the coast to the river. If the merely wasteful effects of fixed engines do not admit of such explicit evidence as their destructive or devouring effects, they admit of just as little doubt as to their existence, and of no doubt at all as to their indefensibility.

CHAPTER IV.

SALMON LEGISLATION.¹

Principles of all Salmon Legislation—Ancient Legislation—Its Curiosities—Suspension of Legislation—Renewal upon the Old Principles—Difference between Agricultural and Fishery Property—The Duke of Roxburgh—Upper and Lower Proprietors—Harmlessness of Angling—The Tweed Acts of 1857 and 1859—The Tay Act of 1858—Ness and Beaully Bill of 1860—Committee of the House of Lords—Royal Commission of Inquiry for England—General Scotch Bill of 1861—General Scotch Act of 1862—English Act of 1861—Irish Acts of 1842 and 1862.

FOR more than six hundred years the preservation or increase of Salmon has been the subject of legislation in all the three kingdoms; and from the first, as now, the leading principle of legislation has been to prevent the fisheries being worked in excess of the natural powers of reproduction. From of old too, as now, that principle has been applied mainly to two points—to prevent the fisheries being worked for a season either too long or mistimed, and to prevent any of them being worked

¹ It is not attempted in this chapter to give more than a sketch of the history and present condition of the laws regarding Salmon; much more full and precise statement would be required for the guidance of persons having duties or direct interests under the Statutes. The whole of the Acts now in operation, accompanied by much useful historical and expository matter, will be found in a recent work, *A Treatise on the Fishery Laws of the United Kingdom, including the Laws of Angling*, by James Paterson, Esq., Barrister-at-Law; and still more minute information as to the Irish part of the subject is given by Mr. Longfield, Q.C., M.P., in a fourth edition of his book, *The Fishery Laws of Ireland*.

unfairly or too severely in respect to machinery, as by engines more effective in capture than the engines ordinarily in use, or operating to obstruct and deter as well as to capture. In other words, the fixing of the proper duration and dates of close-time, and the regulation or prohibition of obstructive, destructive, and especially fixed engines, were the objects aimed at six centuries ago, and are objects not quite attained even yet.

Magna Charta had two clauses concerning salmon—one prohibiting the further “defending” or appropriation of fisheries by the Crown or its grantees, and the other suppressing all weirs or “cruives,” “except only by the sea-coast” (an exception of which the meaning is dubious, and which practically came to nothing). Long anterior to this, however, the common law of England had been found to prohibit all devices which affected salmon-fisheries either in the way of obstruction or of monopoly—in the words of C. J. Ellenborough, “they were reprobated as public nuisances in the earliest periods of our law;” and the clauses in Magna Charta were intended to check the Crown in its attempts to disregard the law as it had long before been declared and acted on. A few years after Magna Charta, an Act passed fixing the close-times; other ancient Acts, both public and private, varied the regulations in that matter; and up till 1861, the close-times of several English rivers were regulated by Acts of Richard II., which had been in force, at least nominally, for nearly five hundred years. In the reign of Henry III., both the common law and the statute-law of England were extended to Ireland by royal ordinance; and at intervals

up to the end of the eighteenth century, all new English salmon Statutes were also, by Poyning's law, extended to Ireland.

In Scotland, which, both in ancient and still more in modern days, may be regarded as the country principally concerned, legislation began almost as soon, and proceeded on the same principle, and towards the same ends, or against the same evils, as in England and Ireland. The commencement of Scotch law-making on this subject, indeed, was contemporary with the commencement of anything like a settled order of affairs under Robert Bruce, and continued to occupy an incredible share of the attention of the Parliaments of his successors for several hundreds of years ; so that, in reading the collections of ancient Scottish Statutes, one is apt to think that the chief thing which Scotland achieved on the field of Bannockburn was "Acts anent the preservation of Salmonde." Old Scotch Acts refer to the preservation of the "reid fische" by means of a close-time ; to the removal of all standing obstructions to the run of the fish, whether meant to capture, or only fitted to impede ; and to the measure, weights, prices, and other conditions of sale. Nothing can be better put than the reason given over and over again in the Scotch Statutes four hundred years ago, for putting down unseasonable fishing and fixed engines—such practices "destroy the breed of fish, and hurt the commoun profite of the realme." The rigour of these old Statutes is as remarkable as their number. For instance, an Act of the first Parliament of James I. (of Scotland), 26th May 1424, runs thus :—"Quha sa ever be convict of slauchter of Salmonde in time forbidden

be the law, he sall pay fourtie shillings for the unlaw, and at the third time, gif he be convict of sik trespasse, he sall tyne his life, or then bye it ;” *Anglicè*, he shall either lose his life, or pay for it. The alternative is a strange one, and all the more strange that the price is not specified. It would be curious to know how the forfeited life of a salmon-poacher was appraised,—whether such things as rank, wealth, and age were taken into account, or whether all Scotchmen were taken at an average value ; also, whether, Scotchmen themselves being the appraisers, the average was put exceedingly high. But after all, whatever the price demanded, there could not be much debating in any offender’s mind which of the two to choose. What will a man give for his life ? Of course, all that he hath. If a man indeed have nothing to give, as is pretty generally the case, at least now-a-days, with “slaughterers of salmonde in tyme forbidden,” the case must have ended fatally ; and at this distant period we can only console ourselves with the reflection, that the local descendants and representatives of those ill-starred slaughterers of the olden time now enjoy an impunity which, perhaps, brings the average sufferings of the race to something like an equality with their average deserts. In the whole mass of Scotch legislation on the subject, we find only one instance of exemption or relaxation, and it is one which English readers cannot fail to admire : the ninth Parliament of James I., 1429, passed an Act :—“Owt-takand,” *i.e.*, excepting from the other Acts regarding salmon preservation, “the waters of Solway and Tweede, quhilkis sal be reddie to all Scottis-men all times of the

yier, als lang as Berwick and Roxburgh ar in the English mennis hands." That is to say, the Scottish King and his Estates solemnly passed an act, authorizing and enjoining all Scottis-men to go a poaching in England, and in those portions of the Border waters in which, though properly Scotch, the English had or occasionally took an interest. And not only were Scotchmen legally authorized to take English salmon, but if Englishmen wanted Scotch salmon, then "it is ordained that na Scottis-man sell to Englishmen, or in England beforehand, or otherwaies, ony salmonde, bot that Englishmen bye them in Scotland for English gold, and none other contentation ; And gif the English-men will not bye them, the Scottis merchandes may send them in Flanders or other places, quhair them thinkis : swa that of na wise they nouthur sende them nor sell them in England."

After the Reformation, the Scotch Acts anent "Salmonde" by no means decreased in number, but are found alternating with what was then a new feature in the Scotch Statute-book : "Acts anent the trew an holy kirk, and them that are declared not to be of the samin" (same) ; "Discharge of labouring of Sabbath dayes, or playing or drinking in the time of sermon ;" "Anent the zouth and uthers beyond sea suspected to have declined fra treu religion ;" and so on. This curiously mingled legislation for the spirit and for the fish (flesh was then a comparatively rare article of diet north of the Tweed), we find going on as long as the Scotch Parliament lasted, with what results is a question only one-half of which it is within our province to discuss. With one of the

departments, the spiritual and moral, we have nothing to do, still less to object to,—the foe and the stranger, the heretic and the scoffer, may indeed imagine that they spy defects ; but it is perhaps enough that we Scotch ourselves claim a great success, and that indeed our satisfaction is so complete that it can neither be augmented by the assent nor shaken by the sneers of our neighbours. As to the other department, the piscatory, one result of that careful and repeated law-making in the old times has been that through centuries a fish has, to some extent, been preserved that would otherwise have been extinguished, and that now we have increased encouragement for the introduction of such means to the same ends as have been rendered necessary by the alterations and extension of the arts of capture, by the lessons of experience, and by the discoveries in natural history—especially for the application of the old remedies to some of the old evils, which have of late years re-appeared in new forms.

Unhappily, however, the vigilance and activity of the Legislature, in all the three kingdoms, and especially in Scotland, died away, or rather suddenly stopped, and a great interval has to be passed over before we find the good work renewed. In truth, till within these two or three years, there had been no legislation worth mention for centuries. This statement, though strictly correct, will astonish many people who have been accustomed to listen to, or even to perpetrate, jokes upon the frequency, or almost constancy, of salmon legislation in our own days, for there is a vast amount of popular misapprehension on this point, chiefly from confounding attempt

with accomplishment, and talking with doing. All sorts of people have got upon their lips a remark of the late Sir Robert Peel, that he "never knew a session of Parliament without a salmon bill," and that remark is understood as meaning that Sir Robert had seen in his day a great amount of salmon legislation. It has failed to be observed that he spoke of Bills, not of Acts. If, when remarking that he had never known a session without a salmon Bill, he had added that neither had he ever known a session *with* a salmon *Act*, he would have come much nearer to conveying an accurate impression of the facts. Indeed, during the long period Sir Robert sat in Parliament, there was not, we rather think, a single Act of national legislation regarding salmon, except the Irish Act of 1842, and the comparatively unimportant and purely mischievous Scotch Act ("Home Drummond's") of 1828. The true inferences, therefore, to be drawn from the fact that many proposals for salmon legislation came before Parliament during a long period in modern times, are, that there was a wide-spread conviction that something required to be done; perhaps some difficulty in determining what that something ought to be; and certainly very great difficulty in getting that something, or anything whatever, actually done. The repeated, but unanswered calls for a remedy are proofs, not of the ineffectiveness of remedies, but of the existence of disease.

It is important to note that the recent legislation has proceeded, as the future legislation is proposed to proceed, on precisely the same principles as the ancient legislation—viewing similar things as evils, and applying similar restrictions as remedies. The principles on

which salmon laws must be construed, in accordance with the obvious designs of the Legislature from the beginning till now, were very fairly, though not quite exhaustively, stated by the present Lord Chancellor, in a judicial decision given from the Woolsack last year. He stated that the leading principles and objects which the Legislature had had in view in all the Statutes, which might be held as mainly declaratory of the common law, were these:—"The first was the object of securing to the salmon a free access from the lower to the upper fresh waters of the rivers, which are the natural spawning-grounds of the fish; the second was to secure the means of return to the young salmon or smolt down to the sea; the third was the prohibiting the taking of unclean fish during certain periods of the year when it was out of season as an article of food." Undoubtedly these have been, and must always be, leading objects in legislation on this subject; but it would have been better that Lord Westbury had stated separately and emphatically another object, which, at the utmost, he only includes as part of one of the three objects he selects for specification,—the forbidding any fishery-owner increasing, through ingenious appliances or otherwise, the efficiency of his instruments to the injury of his neighbours or of the general interest. It may even be doubted, indeed, whether Lord Westbury meant to include this object in the first of the three "principles" he propounded, for, in another part of his judgment, he seemed to lay down the doctrine that the owner of a fishery is entitled to exercise his ingenuity in order to overcome natural obstacles and render his fishery more

productive. But if this doctrine were allowed swing, it would create an entire revolution and ultimate anarchy in the fishing community; it would not only enable the owners of some fisheries, of the smallest or of no value, to make them more productive than the fisheries that have always been highest in value, but in some places it would enable the owners of the lowest fisheries to keep almost everything to themselves. It is a peculiarity of fishery property that it cannot be used as absolutely at the owner's disposal, to "make the best of," like some other kinds of property. A man exercising ingenuity or industry, working by the most effective means, and at all seasons, to take as much as possible out of his own land, is free so to do, because, however much he may take from that source, he is taking nothing from his neighbours. But a man who exercises ingenuity and industry to take as many fish as possible out of his fishery, these fish being travellers, and neither natives nor residents, makes a proportionate deduction from the share naturally falling to his neighbours. If his neighbours did not follow or better his example, they would lose their share; if they did, the amount of capture would be in excess of the recuperative powers of nature, and there would soon be nothing to share. It is a necessity of the present division and competition of interests in fisheries, that the law can permit only uniform machinery or a limited degree of efficiency; in other words, it is necessary that each owner of a fishery shall *not* be allowed to use what he may discover to be the most effective means of taking fish. There is, indeed, as we shall afterwards try to show, a plan by which this prohibition of ingenuity

and improvement, necessary under the existing system, can be got over,—a plan by which the most economical and most productive machinery may be brought into operation, not for the benefit of some and the loss of others, but for the common or proportionate good of all. In the meanwhile, however, and till the system is reformed altogether, there is an absolute necessity for adhering to the old principle that a proprietor shall not be allowed, by the use of novel or extraordinary machinery or appliances, to increase his natural advantages or diminish his natural disadvantages, and so acquire more than his intended and accustomed part of what is practically a fixed or limited whole.

While the recent legislative battles have had reference to the same questions and principles as formed the subjects of the legislation of old, it has happened that, partly from the increased value or demand for rod-fishing, the proprietors of salmon-fisheries have, in a rough way, been of late ranged into two temporarily hostile bodies—the upper and the lower. With some amount of concession and compromise, all the recent Acts have been victories won by the upper proprietors, though in some cases the lower timeously surrendered, from a conviction that the demands of the upper were better for both, and though, in all cases where a battle was fought, the former have already confessed that they were benefited by defeat. As to the two divisions—river or upper, and estuary or lower proprietors—the war may thus be said to have ended to the satisfaction of both parties. There remains, however, still to be fought a sort of supplementary contest,—the battle of both river and estuary against sea,

or rather of moving and ancient against fixed and novel machinery, which the recent legislation has in England and Ireland put in the way of being settled, and has in Scotland specifically left over for future and separate handling, either by legislation or otherwise (of which anon and apart). But it must not be understood that, though even the oldest of the various recent acts of legislation, doing justice to the interests of the upper proprietors (which are ultimately and substantially the interests of all), date no further back than 1857, the battle begun only then or shortly before. Little indeed had been said, much less done, in England ; and as to Ireland, though there was a good deal of talk, the attempt at reform scarcely took shape till 1842, the Act passed in which year was beneficial as to close-time and general management, but injurious in some other respects. Looking chiefly to Scotland, it might be said that, at least from about 1828, the lower proprietors are to be regarded as having been the parties in possession, and almost all the Bills, never becoming Acts, which were before Parliament between 1828 and 1857, were Bills more or less in favour of the upper proprietors, and their rejection formed victories, though very injurious victories, for the lower. The Act of 1828, known as Mr. Home Drummond's Act, the first Scotch Act for two centuries before, and which remained the governing Act for thirty years afterwards, altered the commencement of close-time in all Scotch rivers north of Tweed and Solway, from the 26th August to the 15th September. From about that time—excepting the Tweed, altered in 1857, and the Tay, altered in 1858—the following

were the legal fishing seasons of the Scotch and semi-Scotch rivers till 1863 :—All rivers north of the Tweed and Solway, from 1st February to 14th September ; the waters flowing into the Solway Firth, from various periods between 1st January and 10th March to about the 25th September, with a protraction in favour of rod-fishing for various periods—in the case of the Annan, till 1st November ; and the Tweed and its tributaries from 15th February to 15th October, with three weeks more for rod-fishing. It should be noticed in passing that, though these were the legal seasons, some of the chief fisheries in Scotland were, by the voluntary act of their owners, closed three or four weeks before the period fixed by law, during a considerable number of years before the recent Acts. The chief evil of the Act of 1828 was, that by adding to the length of the net-fishing season, making the addition at the end of the season, and fixing no extended time for rod-fishing after the removal of the nets, it killed a greater quantity of fish, and did not add to but lessened the inducements for the better protection, by the upper proprietors, of the smaller number of fish that reached the breeding grounds. Hence, a great increase of discontent, and many efforts after legislative redress, as well as a gradual but great decrease in the productiveness of the fisheries generally.

Even before the passing of Mr. Home Drummond's Act, attempts had been made to diminish the amount or severity of the fishing ; attempts suggested or necessitated chiefly by the scarcity produced by the new coast nets having been added to the old river nets. Thus, in 1825, a Committee of the House of Commons, presided

over by the Right Hon. T. F. Kennedy, agreed to a Report (subsequently embodied in an unsuccessful Bill), recommending almost all the improvements that have become law only about forty years afterwards,—lengthening of the annual and weekly close-times, removal of obstructions, widening of meshes, suppression of leistering, etc. It is wonderful that, in three years after such a report, Parliament should have quietly passed a Bill, like Mr. Home Drummond's, going in quite the opposite direction. It is not wonderful that that pernicious change was soon felt and complained of. In 1835, the late Mr. P. M. Stewart and the late Mr. James Loch introduced a Bill giving the majority of proprietors, in number and value, on each river the power of fixing the season, but providing that net-fishing should in no case be continued after 31st August, and that rod-fishing should be permitted for three weeks after the withdrawal of the nets. Next year, the same members tried a Bill, dividing Scotland into twelve districts, with different but fixed close-times, and giving fourteen extra days for rod-fishing. Three years later, Mr. Wallace of Kelly had a Bill stopping net-fishing on the 24th of August, and Joseph Hume produced one for giving three weeks' angling after the stoppage of the nets. In 1842, Mr. Ellice, member for the St. Andrews burghs, proposed that the regulation of the salmon-fisheries in Scotland should be handed over "with powers" to the Board of Fisheries. In 1851, the Duke of Argyle brought in a bill making the close-time commence earlier, and giving some weeks of grace to the rod-fishers. All these measures, besides several others, were either thrown out

by one or other of the Houses of Parliament, or withdrawn by their promoters in weariness and despair.

It was in 1857, and more decidedly in 1859, that the tide of battle in the Legislature was turned. That change was brought about not least by the fallacy and failure of the then existing system having become too apparent and too severely felt to be longer doubted or denied. But if the time had come, the man had come too. That man was the Duke of Roxburghe, who was strongest and foremost, especially as to finding the sinews of war, in leading a series of successful assaults upon the old and decaying system, in the cause, not truly speaking of upper proprietors against lower, but of preservation and increase against waste and decay. Without seeking *éclat*, or claiming merit, or even getting much assistance, the Duke gave to this good work years of trouble and thousands of pounds; to him the owners of salmon-fisheries, low and high, owe more than they know of, and certainly very much more than they have acknowledged; and if anglers are ever joyful and sometimes grateful, his is the name that will for ever

“Be in their flowing cups freshly remembered.”

The melancholy fact that war between upper and lower seems to be the natural state of salmon proprietors, though their interests are ultimately and substantially identical, may require a few further words of exposition, previous to describing the more recent legislation, especially for Scotland and the Tweed. The chief points to be noted are—1st, That the parts of a

river at which salmon are caught in the greatest quantities, and in the most marketable condition, are quite different, and generally speaking far removed from those in which salmon are born, and for the most part reared ; indeed, all but a fraction of the whole number of salmon killed are killed in those districts where they are mere passengers, and which are neither their birthplace nor their residence ; 2*d*, That partly from the severity of the fishing at the foot of the rivers, but partly also from the fact that the fish do not much aspire to the higher reaches of the rivers till late in the year, comparatively few fish reached the upper proprietors (and the farther up the worse) until the season when it was illegal to kill them ; and 3*d*, That there thus being no local interest in preserving the fish where they breed and are bred, they (in the Tweed especially) were slaughtered in inconceivable numbers during the seasons when they should be spared, in spite of the costly and strenuous efforts of the lower proprietors to provide a hired guardianship—

“ And many a childing mother then,
And new-born infant died.”

The cry of the upper proprietors was, Let more fish up to us at times when it is legal to kill them, either by extending the open season as to rod-fishing, or by reducing the time or amount of net-fishing, or by both methods—and in the end it will be better for you as well as for us. The reply of the lower proprietors was, *We* are the rightful owners of the fish, because they are passing over our ground at the season when nature meant them for the food of man. And there the two

parties stood upon their rights or their wrongs, the fish meanwhile hastening to extinction.

It may freely be admitted that the lower proprietors were correct in their statement, that salmon taken in or near the sea are the best for food. Although honest—but, as regards salmon, utterly ignorant—Izaak Walton has stated, “It is observed that the farther they get from the sea they be both the fatter and better,” we admit that his statement is just the reverse of the fact. A fish in maidenhood is more wholesome than a fish tending towards the family way. But then, for the propagation of the species, it is absolutely necessary that a certain proportion should be allowed to get into the latter condition. Doubtless, a wether, or an unmarried ewe, makes the best mutton; but if there were no rams and no breeding ewes, there would soon be no mutton at all; and if, in haste to be rich, every farmer were to kill every succeeding year all the sheep and lambs he could lay hands on, without thinking how the stock was to be kept up or reproduced, we should soon have in sheep something like what has been going on in the case of salmon. But there is no actual parallel in recklessness and wastefulness. If landed proprietors used game as fishery proprietors are apt to use salmon, “shooting down the hens,” and not letting one head escape which by any means, fair or foul, they could possibly destroy, nobody could doubt the sure and early result. And yet, to make even this a parallel to the case of salmon, we must suppose that, in addition to his own reckless slaughter, a proprietor had no ground on which birds would breed, and nevertheless so acted as to make

enemies of those on whose grounds they did breed, and who had the eggs and the young at their mercy.

It was the more easy and obvious to suggest that there was serious error in the argument of the lower proprietors, owing to the existence of an error somewhere having been made but too apparent by the dismal results of the system which they tried to defend. Legislation aside, the fish belongs to whoever can catch him. A man, say at Galashiels or Innerleithen, who, during close-time, saw twenty salmon lying in a stream of which he was owner or tenant, had, but for the Act of Parliament, as much right to them then as his brethren below had at an earlier time of the year. Nature sent them there *then* as much as it sent them to Berwick in August. And if it had been said that there is a law of nature against killing fish so conditioned and employed, he would have replied that but for the all-devouring activity of his brethren lower down, *he* might have had fish in summer or autumn too; and also that the lower brethren did not consider themselves above killing fish in much the same condition when they came in their way. The law, therefore, which forbade him to touch them, though a very wise or necessary law, was, he saw, a law to provide fish for the people at Berwick, and not for him, and therefore he looked upon it as a law which he had no interest in maintaining or observing. Those at whose mercy the fish lie during by far the greater and more critical periods of their fresh-water sojourn—their natural and only possible protectors—were thus turned into their worst enemies. They were, as Sir Walter Scott expressed it, made mere

“clocking-hens for the lower heritors,” and took an absolute disgust at the process of incubation. Their grounds were turned into mere lying-in hospitals and nurseries; they scarcely ever saw salmon but as infants, as mothers in a delicate condition, and as invalids only “as well as could be expected.” They were to nurse them when they were young, and to heal them when they were sick; and the people below were to kill and sell them when they had attained health, size, and weight. The upper proprietors were to take care of them for two years without killing them, and the lower proprietors, who could take no care of them, were to kill them before they had been two days, or perhaps two minutes, within their realms. Of course the result was, that the unprofitable duties were not performed by those on whom they naturally devolved, and no other class could act as effective substitutes. The candle was thus being burned at both ends—too many fish were killed at the bottom, and too few were permitted to be born at the top. How was this wasteful process to be stopped? There seemed nothing for it but a little abstinence and patience, enforced by Act of Parliament if need be—burning slower now, that there might be more to consume hereafter.

It was so far fortunate that the lower proprietors (though they were long of seeing it, and in some cases affected not to see it even at the last) had it in their power greatly to placate, though not, strictly speaking, to profit the upper proprietors, without loss, and even with benefit to themselves. What the upper proprietors chiefly wanted was not fish, but fishing—not gain, but

sport. The number of fish sufficient for sport, compared with what is necessary for profit, is utterly insignificant; and the upper or sporting proprietors were and are content to pay very high for what is of comparatively trifling value to the lower or commercial interests. In illustration of this last statement, we may mention that it has been shown, from Tweed statistics, that, at least in some years, the average cost of each salmon to the renters of angling waters on that river is about £3 in rent alone, while the average of rent paid by each fish captured in the netting districts is only one shilling; so that it may be said that for every shilling's worth which the lower proprietors allow to pass, they give the upper proprietors £3 worth of interest in protecting the breed.

It should also be more popularly known than it is, that for the most part it is fish in good or fair condition that are taken by the rod and artificial fly, even at the late periods of the year. It is an entire mistake to think that fish in the act of spawning can be killed by the rod as they can be by the net and leister. A fish on its *redd* will not take a lure, and lies in water where every angler knows it would be hopeless to cast a line. The fish taken by the rod in late seasons are taken in the same haunts, and in much the same condition, as those killed by the rod in the same reaches of the river during summer; that is, waiting and resting, in streams and deeps, on their way to the spawning-beds. So soon as they lie down to spawn, the angler's chances end, and the poacher's certainties begin.

This rule or law of nature extends far beyond fish actually on the spawning-bed: just in proportion as a

fish gets out of edible condition and into the spawning condition, the more disinclined and unlikely is he to rise to a fly. This arises from two causes: the fish, carrying developed roe or milt, get heavy in body and lethargic in mind; and as their condition implies some amount of residence in fresh water and experience of the wiles and cruelty of men, they have become afflicted with excessive caution, amounting, in truth, to contemptible cowardice. A river is often swarming for weeks with brown or gravid fish, whilst the angler toils day after day and catches nothing; and every observant angler knows that, if he sees ten brown fish and one white or silvery one disporting themselves in a "cast," he has much more chance of enticing the single new-comer than any one of the ten old stagers. This fact is recognised in the popular name given to the discoloured fish in many districts both of Scotland and Ireland; "old soldiers" they are significantly called, partly on account of the redness of their coats, but not less on account of their great skill in foraging, and otherwise taking care of themselves.

Finally and chiefly, any additional number of fish killed by the legitimate rod-fisher, during the extended or extra portion of his season, does not amount to two or three per cent. of the number that his and his watchers' presence on the river saves from the poacher, who takes the worst-conditioned fish by the most destructive instruments.

It was, then, in 1857 that the first successful attempt at reform was made, and it was made in a very mild form, by a Bill promoted by the majority of the Tweed

Commissioners, but the real promoter of which was the Duke of Roxburghe. It dealt partly and gently with the question of close-time, but its main object was the suppression of certain fixed engines called stell-nets, and also a less noxious species known as cairn-nets. For a long period previous to 1830, the close-time on the Tweed ran from the 10th October to the 10th of January; in 1830 its commencement was delayed till the 15th October, with a fortnight more for rods; and in 1836 it was continued till 15th February, with three weeks after the autumn close, *i.e.*, till 7th November, for rods. The Bill of 1857 proposed that the fishing should not begin till the 1st of March instead of the 15th of February, the close of the fishing season, or commencement of close-time, to remain as it was both for nets and rods; while a section of the lower proprietors brought in an opposition Bill, mainly designed to keep things as they were, though also, by way of threat, proposing to take away from the upper proprietors the three weeks of rod-fishing they already possessed. At the close of the evidence before the Commons' Committee, the lower proprietors, either themselves convinced, or perceiving that the Committee was convinced, withdrew this proposal, and even offered that rod-fishing should be legalized all the year round, and also that the nets should come off a week earlier. But the mistake had been made; the evidence as to the insufficiency of the close-time, not required for the purposes of the original Bill, but evoked by the proposals in the opposition Bill, had shown the Committee where the chief evil lay; and, unasked and by a unanimous vote, they resolved that a month should be cut

off from the end of the net-fishing season, and a fortnight from the beginning, so making the season run from 1st March to 14th September, and allowing rod-fishing till 14th October. In the Committee of the House of Lords, the time allowed for net-fishing was extended to the 1st October, being a fortnight longer than the period fixed by the Commons' Committee, though a fortnight shorter than the period by the then existing law which the promoters of the original Bill had not proposed to alter. By what ultimately proved a happy accident, their Lordships, in making this alteration on the Bill as it came from the Commons, omitted to make a corresponding alteration in the clause regarding rod-fishing, so that the result, as to the upper proprietors, of the Bill as it passed was, that they got only a fortnight of rod-fishing after withdrawal of the nets (from 1st to 14th October) instead of the three weeks they had possessed for twenty years before, the month which had been offered them by the House of Commons, or the three months which had been tossed to them, *trop tard*, by their tardily converted or frightened opponents. Although the Bill of 1857 was not originally designed to make any alteration on the seasons, that question might in a manner have been considered settled had the Bill chanced to become law as it passed the Commons; as it was, the question was, on the contrary, unsettled, and two years afterwards was brought up again, and then settled, if not in the best of all possible ways, at least in a way more satisfactory than had been previously hoped for.

The Bill of 1859, promoted mainly by the Duke of Roxburghe, had for its chief object the earlier closing of

the fishing season ; and, after a long and costly contest in both Houses, the Tweed fishing season was fixed, for nets, from 15th February to 14th September, and for rods, from 1st February to 30th November. In explanation of what may seem the extraordinary or even inordinate extent of grace here given to rod-fishers, may be mentioned the natural character and circumstances of the Tweed, and the virtual assent of what could scarcely, as to this particular point, be called the opposition party. The Tweed, even taking into account only the main river, is, as to the ground over which salmon range, a very long river, a hundred miles at least, and the salmon not only distribute themselves over it with great slowness as compared with most other rivers, so not arriving at its upper reaches till late in the season, but also, for some reason not discoverable, obstinately disregard the angler's invitation to a little dalliance by the way, till they have ascended to distances from the sea which, on almost all other rivers, are found to be above the best angling districts. The difference between the Tweed and other rivers in this respect, has been attempted to be explained by there being in other cases an estuary, through which the fish have passed before reaching the stream, whilst the Tweed tumbles at once as a river into the German Ocean ; but this explanation is not quite satisfactory, seeing that the habits of the Tweed fish do not differ much more from those of the fish of rivers like the Ness, which has an estuary, than from those of the fish of some rivers like the Spey, which have not. But though we cannot tell why it is, so it is, and Parliament made allowance accordingly. Further,

the lower proprietors, hoping to make powerful friends without cost or even with profit to themselves, made no serious opposition. And they have had their reward. Poaching has immensely diminished, and the productiveness and value of the fisheries generally have greatly increased. The Tweed was benefited, and an example set which other rivers have since adopted with improvements and extensions.

The main object, however, of the Tweed Bill of 1857 was not to alter the close-time, but to suppress an evil local in its peculiar form, but existing elsewhere in other and worse forms ; and this object was proposed to be accomplished on a principle equally applicable to all similar cases. From time immemorial there had existed in the lower or tidal portions of the river Tweed a species of engine called a stell-net, thus described in a paper read to the Newcastle antiquaries by the late Mr. Robert Weddel of Berwick :—“The stell-net is rowed into the river in a semicircular shape. A rope attached to one end of it is held by the fisherman on shore, and to the other extremity is attached an anchor, which is fastened in the bed of the river. The fishermen in the boat then go to near the centre of the net on the outside of it, and take hold of it, and when they either feel fish strike against the net, or see them approach within its reach, they give notice to the men on shore, and while the latter haul in their end of the net, the men in the boat hoist the anchor, release the net, and bring it on shore.” Obviously this engine largely partook of the nature of a fixture or “bar,” remaining stationary across the path of the fish till a capture was made ; and, as in the case of

all engines of that class, its evils lay not only in what it caught, but in what it stopped, doing even more indeed in the way of obstruction than of destruction. Nevertheless, these engines had existed from time immemorial, and it was a strong measure to propose their abolition by means of a private Bill. It is true that the proposal was accompanied by another, assented to only by a majority of those concerned, and which, if the division into upper and lower proprietors had been complete as to interests, must have been reckoned as more than a *quid pro quo*. The middle and upper proprietors themselves possessed a species of fixed net, called a cairn-net. A *cairn* or *putt* is, or rather was, a short pier run out two or three yards into the river, and causing an eddy or "slack-water," into which fish travelling upwards are apt to enter and rest, especially during the *nights* when the river is in travelling condition ; and a *cairn-net* is or was a short net fastened to the outer end of this projection, and then allowed to swing down with the stream, so forming a barrier parallel between the eddy and the main current, and having a good chance of intercepting all fish that turned to pass outward from their resting-place. Of these nets there were several hundreds upon the Tweed ; they were increasable to any extent ; and on many of the upper waters they killed a great many more fish than were taken with the rod. All this the middle and upper proprietors, or the majority of them, offered to give up ; in other words, to give up perhaps one-half of the fish they then killed. This proposal, of course, put two powerful arguments into the hands of the upper proprietors ; that they were applying to their own fixed

engines the same rules that they sought to apply to the much smaller number of fixed engines belonging to the lower proprietors, and that they showed their desire to be not to kill fish by all legal and available means, but only by one means, and that the least destructive of all. Rather unwisely, the lower proprietors as a body made common cause with those of their number who owned stell-nets, and the battle was fought on the general principle that these engines were sanctioned by immemorial usage, recognised as property by law, included in family settlements, and therefore not subject to abolition without compensation, either by a private Bill, or by any kind of legislation. But the Legislature, merely on the ground that these engines were proved to be injurious to the general interest of the fisheries, and that they partook of the nature of fixtures, which are adverse to the spirit of the salmon-fishery laws, entirely abolished them without compensation. There was of course a considerable outcry, and the counsel for the stell-net owners announced that "the decision would be ruinous to some of his clients, and absolutely fatal to some of the most important fisheries." But, apart from the argument as to justice, the result has quite refuted all such statements—the rental, not only of the Tweed, but of those portions where the stell-net existed, has very considerably increased since the abolition of the engines which were represented as constituting so large a portion of the value. It remains to be added, however, that this Parliamentary decision, taken with its sequels, or rather want of sequels, supplies a very striking instance of the want of consistency or fixed principles with which legislation,

on at least this part of the question, has of late years been conducted. On the Tweed, those fixed engines had whatever claim or protection is derived from immemorial usage, and were abolished by means of a private Bill ; a public and Government Bill, designed to abolish throughout Scotland fixed engines of quite modern date, and quite without legal recognition, was not accepted by Parliament ; and while the Tweed Bill of 1857 abolished ancient fixtures, the Tweed Bill of 1859 was not allowed to abolish in the same district certain other fisheries (stake and bag nets), which were and are much more destructive than the stell-nets, and had *not* the pleas of usage and legal recognition.

Another change effected by the new Tweed Acts, and subsequently imported into general Acts both for England and Scotland, was the prohibition of the use of the leister or spear. This was an old, and, especially on the Tweed, a very popular sport ; but it was butcherly and destructive, and by voluntarily surrendering it, the upper proprietors gave another proof that their object was not fish, but only fishing. Night-leistering, with the glare of the pine-torches reflected from cliff, and wood, and water, with the yells, the laughter, and the immersions, was doubtless in some respects a fine sight and a most exciting sport ; but it was slaughterous and wasteful, killing more fish in a few minutes than would have sufficed for a season's sport, and killing them, too, just when they were most useful in the water and most useless out of it. It was no uncommon thing, on some of the upper fisheries of the Tweed, to kill within an hour, on a February or Novem-

ber night, a greater number of fish than had been killed with the rod during the whole season (and the farther up the river, the greater or more entire becomes this truth), to say nothing of the far greater numbers killed by poachers with the same weapon, both in and out of the legal season. The antiquity of the practice, its picturesqueness, and, at the same time, its odiousness to eyes unaccustomed to its beauties and natures unhardened to its butcherliness, are shown forth in these cranky sentences, written 200 years ago by the Cromwellian Captain Francks :—“ When the salmon goes to the shallows, that is the time the prejudicate native consults his opportunity to put in execution that barbarous practice of murdering fish by moonshine, or at other times to martyr them with the blaze of a wisp and a barbed spear. What! are these cannibals or murdering moss-troopers to surprise fish by the engine of fire-light? Such dark conspirators sprung from Fawkes or Catiline, or some infernal incubus.” The Rev. James Hall of London, in his *Travels in Scotland by an Unusual Route*, thus describes and comments upon the practice of salmon-leistering, as witnessed by him about the beginning of the present century, chiefly in Aberdeenshire, Banff, and Moray :—“ There is a shamefully destructive amusement which the men are fond of, and which, though against the law, too many of the proprietors in the upper parts of the country do not discourage,—I mean the killing of salmon in the rivers in winter, while they are spawning. As by law the heritors near the mouths of rivers are entitled to do all they can to prevent fish going up the rivers, so the proprietors on each side of the rivers, in

the upper parts of the country, though it is against the law, seem to wink at their tenants for destroying as many of them as they can, and preventing them from going down the river again ; and thousands of salmon are not only killed in the river Spey, in the Aven, and other rivers that run into it, but also, I believe, in most rivers in Scotland, particularly in the northern counties, by what they call blazing or torch-light, and which they do in the following manner :—When it grows dark, at or near a shallow part of the river, where, during November, December, and part of January, the fish are generally busy in making a bed for spawn, four or five people meet, and having stripped the lower part of the body naked, and having a strong barbed hook (trident), with a long handle, one carrying a large torch of lighted fir, split from the roots of trees found in the moss, they instantly rush into the water, where the fish are busy, and while the fishes know not what to do, astonished at the sudden light, many of them are killed with the long barbed hooks. In many places of the Spey, this is generally repeated several times of an evening ; nay, sometimes, now and then, from four or five, when it grows dark, till daylight next morning ; as the fish that have escaped never fail, after some time, to return to their spawning again ; and, though there is not a doubt that fish in this state are not only what is termed foul, but also unwholesome, yet they are eaten, and often sold at a high price, sometimes even a shilling a pound ; and although to the delicate and luxurious it will appear a strange amusement, on a cold winter evening, to wade up to the neck in water and pieces of ice, yet certain it

is, that those who once begin this amusement generally grow fond of it, and that they seldom catch cold by it, but generally sleep sound, and find it a cure for the cold. It is true this is most frequently done by young men, but it is also true that men of fifty, sixty, and even seventy, sometimes practise it, and come for miles in the coldest evenings, even in the midst of frost and snow, not so much for the profit as the pleasure this amusement affords.”

The Tweed Bill of 1857, as introduced, proposed the abolition of leistering only during night, but Parliament extended the prohibition also to the day-time; and the Act of 1859 rendered illegal even the possession of such a weapon within five miles of the river. It is also well worthy of note that the practice had been abolished by an Act of the Canadian Legislature, even in Labrador, before it was abolished among ourselves—the reason, as stated by Mr. Hind, being “the great waste of fish to which it led.”

In some minor, but still important respects, the Tweed Bills also set examples and gave hints to the framers of future and larger measures—such as by making the weekly close-time begin six hours before and last six hours after the twenty-four hours of Sunday; by prohibiting the killing of fowl fish even during the legal fishing season; by restricting nets as to the size of the meshes (one and three-quarters inch from knot to knot); by fixing the closeness, both as to distance and time, with which ordinary or wear-shot nets may be worked; by attempts towards modifying or removing the obstructions caused by dykes or dams, etc. etc. By

what the Tweed Bills accomplished wholly or partially as to the Tweed, and also by what they unsuccessfully proposed, they gave the cue and the example to the other fishery districts, not only of Scotland, but of England and Ireland; and it was afterwards found that the evidence by which they were supported had not only exposed the causes and suggested the remedies of the prevailing evils, but had imbued the Legislature both with knowledge and with grace.

The district that first followed, and then, in one or two points, bettered the example of the Tweed, was the Tay, the proprietors of which, with something very near unanimity, asked and got in 1858 a local Act, virtually taking the Tay fisheries out of Home Drummond's Act, and cutting off three weeks from the end of their season (making close-time begin on 26th August instead of 15th September), at the same time giving the rod-fishers to the 30th September, or five weeks' grace. For some years previous to this Act, as we have formerly had occasion to mention, a majority of the Tay proprietors had acted voluntarily on the rule of closing on the 26th of August, with the effect of raising their rental from the low point to which it had sunk under Home Drummond's Act; but the new Bill had been rendered necessary by a few of the proprietors having refused to concur in the voluntary arrangement, and insisted on continuing to work their fisheries after their neighbours had closed. One effect of the shortening of the season under the new Act was a further increase of rental, which has now reached a higher amount than ever before. And it may as well be noted here as elsewhere, that not only have

all those rivers which have shortened their season gained in the amount of produce, but that the expense of working them has been largely decreased ; in other words, more fish are caught within a shorter time and at a smaller expense.

In 1860, a year after the passing of the second Tweed Act, two private Bills were introduced, one for the Ness and Beaully, the other for the river Thurso, directed chiefly to sweeping away the fixed nets from the mouths and neighbourhoods of those rivers, though also closing the fishing season on the 26th of August, and allowing some time thereafter for rod-fishing. Here the proposal was substantially, and the principle involved identically, the same as in the Tweed Bill of 1857—the putting down of fixed engines by the instrumentality of private Bills ; the only differences in point of fact between the cases being that in this case the fixed engines were more numerous and destructive, besides being of modern date and disputed legality. After taking evidence, the Commons' Committee passed both the Bills ; but when they reached the Lords, it was successfully urged on the Government that the whole subject of fixtures should be dealt with by a general measure, preceded by a general inquiry. A Committee of the House of Lords was then appointed, which, after hearing a great deal of evidence, made a report, of which the chief recommendations were : That all fixtures ought to be abolished, though adding that if that were found impossible, they ought to be restricted and regulated ; that there should be no fishing with nets later than the 20th of August ; and that the Govern-

ment ought to bring in a Bill applying these recommendations to Scotland generally.

About the same time that this committee of the House of Lords was sitting on the case of Scotland, a Royal Commission was making its perambulations in an inquiry into the case of England ; and that Commission unanimously came to similar conclusions with the Lords' Committee in regard to the suppression of fixed engines, the lengthening of close-time, and all other matters of importance.

Next year (1861), the Lord Advocate, in pursuance of the recommendation of the Lords' Committee, brought in a Bill for Scotland, aiming to carry into law all the propositions of the Committee, with the necessary supplements and adjuncts. All fixtures were to be suppressed ; the annual close-time was to extend from 21st August to 15th February, instead of from 15th of September to 31st of January ; the weekly close-time was to be extended from twenty-four to thirty-eight hours ; and various other alterations were proposed, all in the right direction. This excellent measure, however, met a sad fate by an unusual process. In an evil hour, and perhaps because the sons of Zeruah were too hard for him, the Lord Advocate consented to refer his Bill to a Select Committee of the House of Commons, the selection of which proceeded on a principle quite different from, or rather opposite to, that usually acted on in the appointment of tribunals of that or any other species. The members were selected, not because they had any special knowledge of the matter, but because one or more of their constituents had special interests in the matter ;

and the tribunal thus strangely selected opened its door only once, to hear a single witness on one of the sides, and then sat down in private to tear the Bill to bits in such way as the strength of the different interests might permit. Apart altogether from any question as to the merits of the decision arrived at, this was surely a very anomalous and even irrational mode of procedure. Why should public money and the labours of commissions and committees be expended in ascertaining and deciding upon the facts of the question, if another tribunal, in no way qualified by knowledge, and somewhat disqualified by position, is afterwards to throw aside the facts, and reverse the decision? What is the use of Committee A deciding according to evidence, if appeal lies to Committee B deciding without evidence? The result was pretty much what was to have been expected—after much stumbling and blundering, the Committee, being unable to agree upon any other course, came to decisions which amounted to leaving fixed engines pretty much as they were. The little, indeed, that the Committee did propose to do on this subject was virtually a great concession, though nominally a restriction. One peculiarity in the case of these engines had always been, that they were not sanctioned either specifically or in intention by any charter, nor ever mentioned in any Act of Parliament, excepting to be prohibited. By the Bill, as altered by the Commons' Committee, they would have been mentioned in an Act of Parliament for the purpose of being dealt with on precisely the same footing as the ancient and anciently recognised engines; and though the fixed-net owners, or rather claimants, might have

temporarily lost a little by being subjected to the same new restrictions regarding times and seasons as the owners of the ordinary and ancient fisheries, they would have gained a hundred times more in being for the first time recognised as equal in rights to other fisheries by a Legislature which had never before recognised them as having any legal rights or existence at all. In a word, by the metamorphosis attempted by the Commons' Committee, the Bill designed to suppress fixed nets in Scotland would have been turned into the first legislative recognition or authorization of those devices. In these circumstances the Lord Advocate wisely resolved to withdraw the mangled and distorted remains. The chief blame of this failure lies not upon the Lord Advocate, who attempted excellently, but on the facts that he was strongly opposed and weakly befriended—that the fixed-net owners showed themselves united and energetic, and the river owners divided, apathetic, and captious.

In 1862, the Lord Advocate tried again, and introduced a Bill which, after undergoing various alterations in its progress through Parliament, forms the existing law for all Scotch fisheries north of the Tweed. This Bill did a good deal in itself, and remitted a good deal to be done by Commissioners acting under the powers it gave them. It differed from its predecessors chiefly in omitting the main point, which had also proved the grand difficulty—it left the question of fixed engines almost untouched, and having to include them in the new restrictions imposed upon other engines, took care to declare that no mode of fishing should by the Act be made legal which was or might have been illegal before :

in other words, left the question of fixed nets as open as before, for litigation as well as for legislation. A considerable power, however, was given to the Commissioners, the exercise of which is likely to result in the suppression of many of the most mischievous of these engines, the Commissioners being authorized to fix the natural boundaries between estuaries and seas; that is, the boundaries between the localities in which fixed engines are undoubtedly illegal, and those in which their legality is assumed by some and questioned by others. There may be some doubt whether, as the chief use or significance of the distinction between sea and river has reference to fixed nets, this provision is not open to the objection of, so to speak, renewing or sharpening a distinction which it is a most desirable object to obliterate. Perhaps, however, in all the circumstances, the omission, as completely as possible, of the main question as to fixed nets was the best course for the Lord Advocate or the Government, as there were several other important matters urgently requiring adjustment, and the settlement of which could be effected without placing any additional obstacle in the way of a future decision upon the great question omitted. With these matters the new law has dealt, on the whole, wisely and well, and would have dealt still better and more wisely, had the Bill come out of Parliament as it went in. The annual close-time now extends to 168 days, and, if the Lord Advocate and the House of Commons had had their way, would have extended to 180 days. As the close-time for Scotland generally, under Home Drummond's Act, extended to only 139 days, there has thus been made an

addition of 29 days, or about a month, to the period of repose or abstinence. This is a most valuable reform, and all the more so that the dates or days, though not the duration, of the annual close-time, are allowed to be varied in different localities by the Commissioners, who are "to determine, subject to the provisions of this Act, at what dates the annual close-time for every district shall commence and terminate." This is a duty involving several difficulties, greatly increased by what we take leave to think the serious mistake of making the season the same length in every district. The difference between districts is, for reasons previously stated, not so properly described by the phrases 'late' and 'early' as by the phrases 'long-seasoned' and 'short-seasoned,' salmon beginning to get out of condition about the same time in all rivers, but varying greatly as to the times in which they begin to ascend different rivers in good condition. The variations, therefore, ought to be made at the commencement of the season; but of course, when the law absolutely fixes the length of season, every variation as to the commencement would have a corresponding, or rather counteracting, effect upon the close. Power was also given to the Commissioners to decide for what period in each district rod-fishing shall be permitted after the withdrawal of the nets.

The new close-times have not yet been fixed in all cases, owing partly to the owners of several rivers or districts having neglected to form Boards, as required by the Act, and partly to delays in procuring from the Home Office the necessary confirmations. So far, however, as the Commissioners have been enabled to proceed, they have divided the rivers or districts into three different

classes, as regards the periods for net-fishing :—1st class—open from 11th February to 26th August ; 2d class—from 16th February to 31st August ; 3d class—from 25th February to 9th September. In the first class there have been or are likely to be placed by far the larger number of rivers, including almost all the important ones—Tay, Forth, Dee and Don, Spey, Findhorn, Kyle of Sutherland, Ness, Beauly, etc. In the second class there will probably be no other rivers than the two Esks of Forfarshire, and the Add and Echaig, in Argyleshire. The third class will include the small rivers in Galloway and the south of Ayrshire, and also the Ythan and Ugie, in Aberdeenshire. As to rod-fishing, the Commissioners seem to proceed on the plan of allowing it to continue up to the end of October, unless the proprietors desire an earlier closing. At the end of the volume will be found a table, giving more precisely the close-times of the Scotch rivers north of Tweed, as fixed at May 1864.

The Act also extended the weekly close-time by twelve additional hours, making it run from six on Saturday night to six on Monday morning. Here, too, a discretionary power, and one of a rather embarrassing character, is given to the Commissioners : “ The Commissioners shall have power, on the application of the district board, or of any two proprietors of fisheries in any district, to vary the period at which the weekly close-time shall commence in any district, or any part thereof, in so far as they may think reasonable or expedient, provided that such weekly close-time shall in no case be less than thirty-six hours.” Why have mentioned certain hours

if the Commissioners were left free to fix any *other* hours? In every district the Commissioners will doubtless have it represented to them that some fisheries would be greatly benefited by the thirty-six hours being made to begin at noon on Saturday and terminate at midnight of Sunday, thus giving them the advantage of the dark hours of Monday morning. But just as certainly they will find that the arrangement which benefits those fisheries will proportionally injure others in the same district. On what principle are the Commissioners to decide, and on what principle were they asked to decide at all? What the Commissioners have done so far is to refuse, in the case of river or net-and-coble fishings, any variation of the hours from six to six; but in the case of stake and fly nets (not of bag-nets, which can be reached at all states of the tide), the weekly close-time, if the proprietors so desire, has been made to run from the hour of low-water nearest six on Saturday night to the hour of low-water nearest six on Monday morning.

The Act also effects several other beneficial changes. It prohibits fishing with lights, but, obviously by accident, omits to prohibit the use of the leister also during the day, as do the English and Tweed Acts. It prohibits the sale and use of salmon roe, which had formed a large portion of the remuneration of the poachers, and renders illegal fishing by three or more persons at night a criminal offence.

In short, the new Scotch law deals more or less satisfactorily with all the parts of the question, except the great evil and difficulty of fixed engines, and that difficulty will now be the more easily dealt with when

its consideration is disembarrassed from its surroundings, and is left standing alone, all its ugly companions abolished and gone. All parties interested, and the public more than any party, are under no light debt to the Lord Advocate for pulling through, amid so many difficulties, and the distracting clamour of conflicting interests, the only general Salmon Fishery Act for Scotland which had been passed for more than thirty years, though during that period there had been pretty nearly thirty attempts.

For England, a very important Act was passed in the same year (1861) that the first Bill for Scotland was defeated, the better and earlier success of the attempt for England being ascribable mainly to the fact of the evils in that country having become greater and more obvious. Indeed, matters in England had arrived at such a stage that legislation had to be directed rather to restoration than preservation. Accordingly, a large portion of the English Act refers to the removal or modification of the evils caused by pollutions and obstructions. The substance of the clauses as to pollution is simply the prohibition of "putting into any waters containing salmon any liquid or solid matter to such an extent as to cause the waters to poison or kill fish," unless the offender can show that he has "used the best practicable means within a reasonable cost to render harmless the said liquid or solid matter." The provisions as to the removal or lessening of obstructions, and also as to the regulation of "fishing rivers," are too numerous, various, and minute to be here stated. The annual close-time is fixed to extend from the 1st September to the 1st February, being 153 days, or fifteen

days less than the Scotch close-time ; but the Quarter Sessions and Home Office have power to "extend or vary" the close-time,—an expression which seems of very dubious interpretation. Two extra months—till 1st November—are given for rod-fishing. The weekly close-time is from twelve at noon on Saturday to six on Monday morning, being six hours more than given by the new Scotch law. The minimum size of the meshes of nets is fixed at two inches from knot to knot, or eight inches round. All fixed engines are pronounced illegal, wherever placed, with the exception of "fishing weirs and fishing mill-dams," and of "any ancient right or mode of fishing as lawfully exercised at time of the passing of this Act, by any person, in virtue of any grant or charter, or immemorial usage." There has not yet been time to see to what extent these provisions will abet the evil of fixed engines ; but this much is certain, an end is made in England of stake and bag nets, none of which were sanctioned by grant nor by immemorial usage. Not the least of the benefits of the English Act of 1861, is that it gives comparative simplicity and uniformity to the Salmon Laws of England, which formerly were in unworkable confusion. The new Act repealed, so far as relates to salmon, no fewer than thirty-three old Acts, of which twenty-six were general and seven private. Though the present, therefore, is not the best of all possible laws, it is one good law coming in place of many bad or useless laws.

In Ireland, up till 1842, the fishery laws had been for centuries the same as those of England, though modified and somewhat confused by differences in the

nature of property tenures. Excepting as to the question of fixed engines, it is not necessary now and here to refer to anything beyond the main provisions of the existing law, which passed in 1862. The annual close-time, which had previously been 124 days, with varying dates, is now 168 days, as in Scotland, with dates varying in different districts at the will of the Commissioners, and angling is permitted for the whole period from 1st February to 1st November. The weekly close-time extends from six on Saturday morning to six on Monday morning, being twelve hours more than the Scotch weekly close-time, and six hours more than the English. In minor matters the provisions of the existing Irish law do not differ materially from the English and Scotch laws. Regarding fixed engines, both the history and the present state of the Irish laws are too complicated to admit of more than an imperfect description. In Ireland, as everywhere else, stake and bag nets were innovations upon the old methods, introduced at comparatively recent dates; and, though there were judicial decisions holding them illegal both at statute and common law, the practical questions as to their removal were greatly encumbered by the varieties and dubieties of the tenures on which fisheries were held. In 1842, an Act was got through Parliament, partaking, at least in appearance, of the nature of a compromise, sanctioning a few of the existing fixtures, and these only. It is or was complained, however, that, besides in these few cases making legal what had been illegal, this Act, by an indirect process, gave a *quasi* legality to almost all the fixtures, the imperfections of the law being greatly aggravated by

the neglect and malversation of the Magistracy. That the operation of the Act of 1842, on this point, was evil, may be inferred from the fact, that, after great grumbling and contention, its provisions as to fixtures were to a great extent repealed by the Act of 1862. By that Act, bag-nets are prohibited within any river, as defined by the Commissioners, or within three miles of the mouth of any river, as so defined, with the exception of cases in which the right of salmon-fishing in the whole of a river and its tributaries and lakes belongs to one proprietor. No *new* fixed nets can be erected anywhere. The Commissioners can order the removal of all fixed nets that are in their opinion injurious to navigation, or otherwise illegal. No cruive or trap can be used within fifty yards of a mill-dam, unless the dam has a fish-pass approved of by the Commissioners ; and nothing in the Act is to render legal any fixed net or fishing weir in contravention of any previous Act of Parliament, or of the common law in force in Ireland. Though the principle of the Irish Act, therefore, is not the suppression of all fixtures as necessarily and in their nature evils and encroachments, it deals with them as things which the law must jealously watch and tightly restrict ; and it would appear that the Act is interpreted and worked by the Commissioners in such a way that, as to Ireland, the mischief may be regarded as not only stayed, but reduced to comparative unimportance.

In 1863, a very useful little Bill was brought in by Government, and passed without resistance, "prohibiting the exportation of salmon at certain times." The evil which this measure was designed to cure, and in the

cure of which it has already made considerable progress, was exhibited by returns to Parliament, showing the declared value of the salmon exported in each of the months of the years 1861 and 1862. The year may, as to salmon, be divided into two equal parts, one during which the fisheries are legally in operation, and the fish in good edible condition, and the other during which fishing and sale are illegal, the fish unwholesome, and their capture destructive of the breed. It appears from the returns, that, measured by value, just about as much salmon was wont to be exported during the illegal as during the legal season ; and as the value of foul fish as compared with clean is seldom more than one-fifth, it would appear that by far the greater part of the salmon exported consisted of fish taken in the breeding season, and in the most unwholesome condition, besides having been stolen from the fishery-owners, and in violation of laws designed to preserve from extinction a valuable article of food. In 1862, the value of the salmon exported was £41,657, and of that value almost precisely a half was exported during those months when there was no legal fishing, and each of four of the close months showed a much larger export than each of four of the other months. In fact, as soon as the period of the year arrived at which fishing becomes legal, the export of salmon dwindled to a trifle,—several thousand pounds' worth being sent abroad in the last month of the close-time, and only a few hundreds in the first months of the open season. The evidence was complete, that the export trade in salmon was in the main a trade in stolen and unwholesome commodities. The mode of cure was obvious.

The *sale* of salmon was prohibited during the months in which the fisheries are legally closed ; prohibit the export also. To preserve the fisheries, we had made laws against selling stolen and unwholesome fish among ourselves ; to allow the sale of the same commodity to our neighbours, was not only an inconsistency, but was an injustice both to our neighbours and ourselves. The evil, too, was increasing, the export of 1862 having been nearly double that of 1861. On the recommendation of the Customs department, the Government introduced a Bill, now law, prohibiting the export of unclean or unwholesome salmon at all times; and of "any salmon caught during the time at which the sale of salmon is prohibited in the district where it has been caught;" the burden of proving that the salmon entered for exportation are not so entered in contravention of the Act being laid upon the exporter. The effect of this Act, in co-operation with the clause in the other Acts prohibiting the sale and use of salmon roe, has been very beneficial ; and, although a considerable quantity of foul salmon is still smuggled to the Paris market under false entries, the Customs will doubtless fall upon some method of stopping that evil and punishing the evil-doers.

From this necessarily brief, rough, and imperfect sketch, it will be seen that, as to one of the two chief questions regarding salmon-fisheries—*i.e.*, the length of the season—the recent legislation for all the three countries has tended in the same direction, and has gone, in all the cases, pretty nearly the same length. The annual close-time and the weekly close-time have both been lengthened as to the commercial modes of

fishing, and there has been an extension of privilege, or rather of right, to those upper proprietors whose wishes are satisfied by obtaining only a very small proportion of the fish all of which are born and bred within their realms. But the other great question—whether certain modes of fishing, prohibited to the more ancient and important fisheries, are justly or even legally permitted to the newer fisheries—though it has been brought pretty near to a satisfactory settlement in England and Ireland, has in Scotland been left over for separate consideration and handling. The removal of fixed engines is not the only thing left to be done for the Scotch fisheries, but it forms the most important and urgent part of the remaining work ; and therefore it is necessary to inquire more particularly what these engines are, and why they are, whence they came and where they are going to, what they have done and what ought to be done to them.

CHAPTER V.

FUTURE SALMON LEGISLATION.

Scotch Fixed Nets—Pollution of Rivers.

“CLEAR your mind of cant,” is an injunction much needed to be addressed to the public and the Legislature regarding the question of fixture-fisheries on the coasts of Scotland. The public mind, which of course the legislative mind reflects, has become infected with the idea that these engines are a “property” which it would be robbery to take away ; but the fact, easy of demonstration, is, that the so-called property is in truth stolen goods, or rather the means of stealing goods that had for centuries been the lawful property of others. If that portion of the value of any fishery which is derived from the use of those engines can in any sense be called property, it is a property unjustly or violently carved out of other property—a new property sliced off from an old property by instruments which the old property is not allowed to use for its benefit or defence.

In Scotland all property in salmon-fisheries is constituted by or derived from Crown grants. Now the sum of the whole matter as to fixed nets is condensed in this little fact—that the Crown never made a grant of salmon-fisheries with the intention or under the slightest sus-

picion that the fishing was to be performed by fixed nets. All the charters for sea-coast fisheries were granted, and all those fisheries were worked, long before those engines were resorted to or thought of. It is therefore not an inference, but a simple matter of fact, that, if the owners of sea-coast fisheries were now compelled to recur to the machinery which they used at first, and which is the only kind permitted to their neighbours still, they would have left to them all that it was ever intended they should have, and all that they ever had, till, within these few years, they, at their own hand, seized what had from ancient times belonged to others.

The question is not whether the sea-shore proprietors holding fishing charters shall retain their right of salmon-fishing, but whether they, and they alone, shall be allowed to fish by any and every means they can devise ; more especially, whether they are to be allowed to use a species of engines not contemplated when they acquired their right of fishing, not used by them till a very recent period, and strictly prohibited to all their neighbours. It is not a question of taking away any "right," but of applying the same regulation to the same right at one spot as is applied to it at another round the corner. It is not a question of taking away any portion of any kind of "property," but of bringing all portions of the same kind of property under the same law.

The assertion that these nets are "legal," is questionable as fact, and worthless as argument. Their legality is not judicially decided ; if they are legal, it is by oversight, or rather want of foresight ; and though they were entirely and unquestionably legal, they would still be in

no stronger position as to legality, and in a much weaker one as to consuetudinary use, than many of the modes of fishing which the fishery laws have suppressed from time to time throughout several centuries.

The judicial decision on the point of legality went only this length—that the river or upper proprietors had not a sufficient title to sue, that title being only in the Crown as grantor. No action at law has been raised by the Crown, and consequently it has not been really decided whether the law would support these engines against a plea by the grantor, that the grant had been abused or exceeded. It is almost necessary, however, to presume, from the fact of the Crown never having raised such an action, that its law-advisers have been of opinion that the law as it stands is not sufficient to reach these engines. But, assuming that, how is it that the law happens so to stand? Simply by accidental omission, or rather by the evil not having been in existence or contemplation when the laws were made; in short, from the laws being old and the engines new. From the earliest period, as already mentioned, legislation was directed to prevent the erection of any standing obstruction, or even of any object the sight of which might deter, in or across “the run of the fish.” Until quite lately, it was not known that the fish had a “run” along the sea-coast, almost as definite, and, generally speaking, no broader, than their run within the estuaries and larger rivers; consequently the words as to fixtures used in the Acts had reference only to rivers and estuaries—that is, to the only places where fixtures had existed or were thought possible. And even after it was discovered that

salmon could be caught in the sea, and not merely in the rivers and estuaries, and when fisheries on the shores of the sea began to be asked for and granted (which was about two centuries and a half ago, the earliest charter for a sea-shore salmon-fishery which has been obtained, being of date 1603), no question arose about fixtures on the sea-shore, because the fixed engines then known were not applicable to those localities, and it was not till two hundred years afterwards, or till our own days, that any engines were devised capable of standing and operating on the open coast. If therefore these engines are legal, it is only because they are not named nor specially struck at in any Act passed before they existed ; and it is only through accidental omission that the Statute-law did not long ago deal with them in terms of express prohibition.

But does the past history of salmon legislation, any more than do the dictates of common sense, sanction the principle that whatever is must always be? On the contrary, that history shows that, especially in regard to fixtures, legislation suppressed from time to time whatever devices were deemed unfair or injurious, without regard to the sanction they had received either from law or antiquity. Up to the middle of the fifteenth century, it would appear that fixed engines, of which the only species then known were cruives and yairs, were legal everywhere. They were then suppressed in estuaries and "within flude-marke of the sea"—a cruive working in the full run of the fresh river under certain regulations being regarded as less mischievous. These prohibitions were imposed at first only for a specified term of years, but afterwards in perpetuity,

and the Acts expressly included in their prohibitions even those engines for which the Crown had granted special permission ; that is, permission not only to fish, but to fish by that particular mode. Thus in an Act of James I. (1424), it is “ ordanyt that all cruvis and yaris set in fresche watteris, quhar the see fillis and ebbis, the quhilke destroyis the fry of all fisches, be destroyit and put away for thre zeris to cum, notgaynstandand [notwithstanding] ony privileges or fredom geifyn in the contrare.” In the same reign, another Act (1477 or 1478) runs thus :—“ It is statute and ordained that the acte maid of before be King James the First anent the cruves sett in waters be observed and keiped, the quhilk beiris in effect that all cruves set in waters quhair the sea fillis and ebbis, the quilk destroyis the fry of all fisches, be put away and destroyed for ever mair, notwithstanding all freedome or priviledge given in the contrair.” Ten years afterwards, it is “ statut and ordand that all cruvis and fisch-dammys that ar within salt waterys quhar the sey ebbis and flowis be alutly destroyit and put done, alswele thai belongis to our Sovereine Lord as utheris through all the realme.” And in another Act, referring both to cruives in the localities above specified, and to cruives in positions up the rivers, where they were legal, but in the working of which the requirements of the law had not been obeyed, “ all schireffes, baillies, and stewards” are ordered “ to destroy, cast-doune, and put away all the said cruives within their bounds incontinent without ony delay.” Here we see that modes of fishing which had been prosecuted from time immemorial, and prosecuted under Crown rights for the exercise of those modes,

were suppressed by statute, the suppression including the fisheries not only of private persons, but also the fisheries retained and worked by the Crown itself. Those Acts were dealing with the only kind of fixtures then known, and they made no scruple of suppressing them in all positions where they were considered hurtful to the breed of fish and "the commoun weill." Yet at the present day we are told that it would be monstrous to legislate to the same effect regarding modes introduced, so to speak, only yesterday, and which are exercised, not only without special rights conferred by the Crown, but under rights conferred with a view to the use of quite different modes. The salmon-fisheries of Scotland may, as to the present question, be looked at as consisting of two divisions : in one division we have the great majority of the fisheries in number and value, situated in rivers and estuaries, and which have existed from time immemorial ; and in the other division we have a very much smaller number and value of fisheries, situated on the sea-shores, which came into existence centuries later than the others, and acquired any considerable value only within the present generation. The former were, five hundred years ago, subjected to certain restrictions, which it is said it would be robbery to apply to the latter even now.

Of course, when the question is one of legislation, and not of litigation, to talk of "prescription," as many do, is no better than nonsense. The modes of fishing suppressed by the old Statutes just cited, and various other practices suppressed by various other Statutes, had incomparably longer prescription than the engines now

in question. "Forty years," is the present cry of the owners of sea-shore fixtures ; but the owners of river and estuary fisheries, when it was long ago and often proposed to do to them what it is now proposed to do to the coast-fishers, might have cried "Ten times forty years," and could have pointed to charters and laws expressly giving them what the law afterwards took away from them ; while the owners of sea-shore fisheries cannot show any charter in which their engines are authorized or mentioned, or any law in which they are mentioned, except to be prohibited. Even as matter of fact, the statement that these nets have existed on the sea-shore for more than forty years is not true, except to a very limited extent ; it is only two or three of the earliest of them that can boast that degree of antiquity.

It may be desirable to explain, in passing, that in denying to stake and bag nets the antiquity even of forty years, we are putting out of view the district of the Solway. For that exclusion there are several good reasons—such as, that the Solway was never under the general Scotch law, but had nominally a law, and practically a lawlessness of its own ; and that the Solway is an estuary, whereas we have been speaking of the period of the erection of fixed engines upon the shore of the sea. The Solway, in fact, was not only not under the protection of either Scotch or English law, but was specially and designedly left unprotected. The reason for this, on the Scotch side, was candidly stated in an Act passed at the time of the union of the Crowns : "because the rivers at that tyme devyded at many points the bounds of England and Scotland, whereby the forbear-

ance upon the Scots part from the slaughter of salmon in forbidden tyme, and of kipper, smolts, and black fishe at all times, would not have made salmond ony mair to abound in these waters gif the lyke order had not bene observed upon the English side." Hence it was that fixed engines, other than cruives and yairs, were of earlier date on the Solway than elsewhere; and hence, too, those allusions in Scott's *Redgauntlet* to the existence of fixed nets in that region about 1750, which have given rise to great misconceptions regarding the date of the engines which are now ordinarily understood when we speak of fixed nets. It was not till 1788, or nearly forty years after the period of which Scott wrote, that anything like the present stake-net was devised, even with the design of operating in the shallow and sheltered waters of the Solway estuary. The nets that had existed in the Solway previous to that date, though of the nature of fixtures, were not similar to nor fitted to do the work of the sea-shore engines which, within these few years, have so greatly injured the general interests of the salmon fisheries, nor indeed were they fitted for any other tidal waters than those of the Solway Firth, which have great peculiarities, such as wideness, shallowness, and discoloration. The ancient Solway nets were of three kinds. One kind, called "the half-net," was similar to the ancient stell-net of the Tweed, previously described, the chief difference being that the outer end of the net was held, not by an anchor, but by a man, who stood as deep and as long as he could in the advancing tide, and brought his end of the net ashore as soon as a fish struck. A second kind, called "the poke-

net," was set *slack* between two poles in some of those parts of the sands across which fish were likely to take their course, and so captured the fish by entanglement. The third species, called "the raise-net," was also fixed between poles or stakes, but rose from the bottom with the rising tide, so letting the fish pass upwards into the "lakes" or flats at the lower part of which these engines were erected, and then fell with the ebbing tide, so enclosing the fish, and capturing such of them as sought to return downwards. It was apparently this last kind of net to which Scott, in *Redgauntlet*, makes the Quaker Geddes allude: "Nets which work by the ebb and flow of the tide." It will be seen that all these three kinds of nets were fitted only for the peculiar circumstances of the Solway, where there are far-stretching flats, a strong tide, and a loose sand, which, raised by the rush of the tide, discolours the water, so as to prevent the fish seeing the obstruction. They differed entirely from what we now call the stake-net, which puts across the path of the fish an impassable wall, terminating in a labyrinth or trap, where entrance is easy, and exit impossible. The great difference indeed between these old Solway fixtures and the new species is sufficiently proved by what happened when what may be called the real stake-net was introduced into those regions. It was introduced at a fishery near Annan in 1788; and, as we have already had occasion to mention, in a few years it had almost eaten up all its neighbours, and soon after was eaten up itself. The same device was then resorted to in the Firth of Tay; but that district being under the Scotch law, and being judicially declared an estuary, the attempt

was suppressed. It was only after all this that the kinds of nets now under question were set up at the places where they now abound. The year 1821 was the date when the first stake-net was erected on the shore of the sea. The place was Dunninald in Forfarshire ; the rent—so entirely novel was the experiment—was at first every fifth fish, but at the end of three years was made £400 in money ; and the man who did the deed is still alive, and (strange to say) happy.

But, though the facts as to the real age of the engines now in dispute were otherwise, it would be monstrous to infer that what has existed for forty years has thereby acquired a right to exist throughout all ages, especially when it is plain as day that the whole scope and principle of the fishery laws, extending over centuries, has been to restrain or suppress whatever was found to be inequitable or injurious, without regard to the date or circumstances of its introduction. "Prescription," therefore, must go out of the controversy as an impostor and interloper.

Neither is it of any avail to say that those sea-shore fisheries cannot be fished by any mode but the newly-devised one ; because, in the first place, it is not and cannot be true ; and in the second place, because if it were true, it would be nothing to the purpose, seeing that the same plea might be raised for large stretches of river as well as of shore, and that it is just saying that the sea-shore fisheries have not any value but that which consists of value taken from their neighbours, by means which their neighbours are denied. All the charters were granted, and all the fisheries fished, long before the modes

of fishing now in question were used or invented ; so that the property was not granted or acquired with any view to its present uses, and it must have been found capable of those other uses to which it is now proposed to revert. The oldest coast charter is dated 1603, the latest 1819 ; only four such charters have been granted within the present century ; and the latest was not, any more than the earliest, granted under any idea that fixed nets would be used. Also it is worth mention in passing, that the coast fishery which got its charter last before the time when fixed nets were introduced, has now been fished out of existence by the competition of more favourably situated neighbours.

The very fact of a sea-shore salmon-fishery having a charter is evidence that that fishery can be, and that it has been, fished by the ordinary process of net and coble, or by processes other than fixed nets. If that fishery had not been so fishable, it would not have been a fishery at all, till within these few years, and therefore would not have been granted, purchased, or fished, as those fisheries were, for generations preceding. In a "Statement for the Proprietors in Scotland who hold Crown grants of Salmon Fisheries in the Sea," laid before Parliament in 1861, it was said :—"It is impossible to fish with profit in the sea in Scotland except with fixed nets ;" and again : "The suppression of every kind of fixed nets is a practical destruction and confiscation of the rights of those who possess Crown grants of salmon-fishing in the sea ; and sea-coast proprietors would be deprived by the Bill of every available mode of fishing." Every man who said this, or had it said on his behalf, had acquired his rights

long before, and without reference to, the introduction of those engines which it was proposed to suppress ; had found other means of fishing available ; and would have had nothing confiscated that it was ever intended he should possess, or that his ancestors ever had possessed. But suppose there were or could be portions of the chartered shore-fisheries not capable of being fished otherwise than by fixed engines, it is equally true that there are great portions of rivers and estuaries in precisely the same position. Take the Tay for instance. Under a well-known decision of the Courts of Law, defining the boundaries of the " estuary," within which the old Acts were applicable, several estates lost rentals of thousands a year by fixed engines being prohibited, and no other being effective at these spots. It is ridiculously untrue that of fisheries in rivers which but for the law would be fished with fixed engines, all are or can be fished otherwise. On every river and estuary there are whole tracts now valueless as fisheries that would become great properties but for that principle on which all existing laws are based, and yet which is now denounced as a novelty and confiscation. If to subject this new and hitherto favoured class of salmon-fishers to the same restrictions as their neighbours, would render their fisheries almost valueless, that is just saying that their property is naturally and properly of very little value, and is no evidence at all that they are entitled to make it valuable at the cost of their neighbours, and by means in the use of which their neighbours are not allowed to compete. It is surely a fair presumption that the Crown did not contemplate giving a man a fishery at one point, im-

posing very severe restrictions upon him, and then that another man round the corner, where perhaps there is not very much difference naturally, though one is called the estuary and the other the sea-shore, should be allowed to put up engines which the other was prevented from using, to the injury and almost to the annihilation, as it has proved, of the older grants. The gift was accepted and for centuries used under this presumption or fact, and if the recipients lost anything by being put on the same footing with their neighbours, it would not be a property they had got from the Crown, but one they had taken in spite of the intention of the Crown and the spirit of the law.

The public or parliamentary mind has not sufficiently in view that all that value which the fixed-net fisheries have had added to their original value by the use of these engines has been so much and more subtracted from the value of other and older fisheries. The fixed net fisheries, we are told, are properties that have been bought and sold, produce large rents, and involve the interests of widows and children. But when and out of what have these properties been created? And are there no "widows and children" but those of the owners of bag-nets? Those properties—*i.e.*, so much of them as is dependent on the use of fixed engines—have been created within comparatively a few years, and at the cost of other and older proprietors. All has been subtracted from the river proprietors to whom is denied the use of the very modes that have impoverished them. There are or were some valuable fixed-net fisheries created within twenty years on the coasts of Ayrshire ;

but they were carved out of the river-fisheries, which were "confiscated" to the extent of about three-fourths. Fixed-net fisheries to the value of several thousands a year have been created on the coast of Aberdeenshire; but whilst that process has been going on upon the coasts, the annual value of the produce in the two Aberdeenshire rivers has been reduced by nearly £18,000 a year! Of the fisheries on the Conon, nine-tenths were transferred in two or three years to a stake-net erected in the Cromarty Firth. About three-fourths of the value of the ancient fisheries on the Ness and Beaully, including about nine-tenths of the value of the fisheries belonging to the Corporation of Inverness, were transferred in the course of a few years to the proprietors of the sea-coast down the firth, using engines which the law prohibited to the proprietors farther up, and had been designed to prohibit everywhere. In the Solway, as we have seen, one stake-net, the first of its kind, almost entirely swallowed up the neighbouring fisheries, swelled itself up to more than a hundred times its former and natural size—and then burst, the whole value of the coast fisheries in that district, now fished by stake and bag nets, being at present about a tenth of what it was when salmon were cheap, and these inventions not found out. In the view of such facts it is scarcely prudent to talk of confiscation and transference.

Besides what they take from the older and rightful properties, those engines take a great deal from the public, and do not proportionally benefit those who claim them as property. It is their nature to operate in deterring and obstructing as well as in capturing, and

they so operate in a more injurious way than the similar causes operating in rivers. When salmon are stopped or frightened back within a river, it is, generally speaking, only a matter of delay and return ; but in the sea, the fish stopped by the standing nets, if they escape capture, are driven out among their natural enemies the seals and porpoises, who systematically wait outside for the chance. Again, though affording less employment than the ordinary nets, fixed nets are very costly to work, owing to the great tear and wear of materials caused by the action of the sea. Taking the average of known cases, it requires at least three fish to be taken in these engines for one taken by the ordinary methods, in order to produce the same amount of rental or profit. One highly experienced lessee of salmon-fisheries stated before the Lords' Committee that one small fixed-net fishery in his neighbourhood, in order to the payment of a £12 rent, required to kill a greater number of fish than he, fishing within the river, required in order to the payment of a £650 rent. Partly in further explanation of such results, and partly as exhibiting another evil, it may be mentioned that those nets, standing on the open coast, can seldom fish during those earlier months of the year when fish are in the highest condition and greatest demand.

In what has been said here, the reference has been almost entirely to fixed nets on the sea-shore or anywhere else, not to cruives on the rivers. Legally and morally, cruives differ from stake and bag nets chiefly in this, that the right to fish by cruives was specially granted by charter, and has always been recognised by law. Practically, there is also this difference,

that cruives, besides being few, cannot be increased either in number or efficiency, as no new charter authorizing them where they do not now exist could be obtained, and as the law tightly regulates their mode of working ; while fixed nets are capable of great extension, both as to number and as to length or reach. For instance, a plan has lately been adopted by which, after a stake-net has been carried out as far seaward as the depth of the water or the nature of the ground will permit, bag-nets (that is, nets of the same kind as the others, but fixed by anchors instead of stakes) are placed at the outer end in continuation, the whole sometimes being a mile in length, and not only forming a barrier across more than the whole of "the run of the fish," but also capturing many of that proportion of the fish which, after striking the leader in-shore, do not go into the trap of the stake-net, and would, but for the bag-net beyond, escape for the time. Indeed, engines of this kind being as yet but in their infancy in more senses than one, it is impossible to foresee to what lengths or into what new shapes they may grow ; while cruives cannot be, as they have not for centuries been, increased either in number or efficiency, but on the contrary can be, as they have been, greatly reduced, both as to their obstructive and their destructive effects. Nevertheless, cruives are evils and excrescences, and their owners would be great gainers by conceding, as all but two or three of them are understood to be willing to do, that they should be included in a measure abolishing all fixture fisheries, without distinction of sea or river, box or net.

Besides all the facts and arguments against fixed nets, there is the important if not conclusive consideration, that, speaking as to legislation, the question is really *res judicata*. It has been before many tribunals, and all, after hearing evidence, have come to the same decision. Time after time, Royal Commissions and Committees of both Houses of Parliament have condemned the existing system, and handed it over to the Government and the law for execution. That sentence has already been carried out for England, and is in process of being carried out for Ireland; and it is anomalous, as well as unreasonable and unjust, that when all are under the same condemnation, the system should be brought to execution as to England and Ireland, and reprieved as to Scotland, where its earliest and its greatest offences have been committed. The exceeding anomalousness of this surely temporary state of things is illustrated very curiously, if rather in caricature, by the fact, that certain fixed nets are suppressed in Scotland (after 1st January next) by the late Scotch Act, and that these are the only nets of the kind, in Scotland or elsewhere, which possessed the claim or excuse of something like antiquity. The more immediate reason for making the shores of the Solway Firth an exception to the rest of Scotland is, that the proprietors on the English shore very justly and naturally insisted that, as the nets on the two sides of the firth, though on one side they stand in Scotland, and on the other in England, virtually captured the same broods of fish, they should be subject to the same laws of fishing. In further illustration of the anomalous and untenable condition of

things presently existing, there is the curious contrast to the case of the Solway supplied by the case of the Tweed, the mouth of which river may be regarded as holding, on the east side of the island, the position corresponding to that which the Solway Firth holds on the west. Whilst on the Solway the new English law as to fixtures is carried across into Scotland, on the Tweed the Scottish law or want of law on the same subject, is carried across into England—certain very destructive fixed engines on the sea-shore of Northumberland, six or seven miles south of the Border river mouth, being preserved by comprehension in the Tweed Act of 1859, while all such engines farther south have been swept away by the English Act of 1861. Why, in this matter, do justice to Cumberland, and upon Dumfries and Kirkcudbright, and do injustice to Berwick by giving privilege to Northumberland? Why knock down those engines in the only place in Scotland where they were of old date, and sanction or protect them where they are innovations? And why, on the other hand, preserve them at only one place in England, and sweep them away from all other English ground? There is no answer to these questions, except the temporary and apologetic one, that there is a good time coming.

The difficulties in the way of obtaining a legislative measure on this subject which will make the laws square with justice and with themselves, consist in the strength of the "interest" concerned, and in the public, and consequently the Parliament, having laboured under a considerable amount of ignorance and misconception as to the facts and equity of the case. But the enemy's

strength is, to say the least, no greater than it was, whilst the strength on the right side has become greater, both by the discussions that have taken place, and by the actual advances made in recent legislation. Formerly the demand was that an evil existing in all the Three Kingdoms should be put down just because it was an evil, and, as the old Scotch Statutes had it, was an evil "destructive of the commoun weill." But now, in addition, we can raise the cry of "justice to Scotland"—can complain that the Scotch proprietors and public are refused the justice which has lately been accorded to England and even to Ireland. Remembering, however, the feeble and straggling support and the vigorous and compact resistance which the Lord Advocate found when he brought in his Bill of 1861, it may be doubted whether the Government could, in the meanwhile, be induced to renew a proposition which made so many enemies, and attracted so few and such captious friends. It is therefore of the more importance to inquire whether there is not some possibility of settling the question without legislation; or, to come to the point at once, by the Crown, as the owner of the fisheries on all the ungranted coasts, forcing or frightening the fixture-fishers on the granted coast into submission, by threatening, and threatening in earnest, to grant or lease the whole ungranted coast to new competitors. The Scottish sea-coasts, as to salmon-fishery, may, or lately might, be viewed as divided into three parts—a part which the Crown had granted away, and which was fished in a way the Crown never contemplated, and which the law never sanctioned, though it may accidentally have omitted to

prohibit ; a part which the Crown had not granted away, but which was fished by the *ex adverso* proprietors of the soil without warrant ; and a part which was ungranted and unfished. When, in 1859, the decision of the House of Lords, sitting in appeal, settled that no person had a right to fish salmon in the Scotch seas without grant from the Crown, the Commissioners of Woods, Forests, and Land Revenue sent out circulars to 345 persons, exercising salmon-fishing on the sea-coast, without being positively known to possess charters, informing them that, unless they possessed valid titles under express grant from the Crown, the fisheries were the property of the Crown, and subject to the administration of the Land Revenue Commissioners, but offering, in the cases where want of title was admitted, to give a short lease of the fisheries at a rental proportionate to the profits of the three years preceding. About a year after those circulars were issued, the Solicitor of the Land Revenue Commissioners stated to a Committee of the House of Lords, that 120 out of the 345 persons had sent no answer, that 180 titles were under investigation, and that twenty-nine persons had confessed want of title, and accepted short leases at rents amounting in all to about £600. Of the progress that has since been made little information has been allowed to transpire ; but we believe that the number of persons who have acknowledged want of title, and agreed to pay rent as temporary tenants of the Crown, has at least doubled since 1860, and that the rent now drawn on behalf of the public from this partially recovered property is upwards of £1200. Here is a pretty good beginning—£1200 a year restored

to the public revenue, though there are as yet only about 50 convicts out of 345 *suspects*. But there is a great field beyond this one—a large though unascertained extent of coast which the Crown has never granted, and which nobody has taken illegal leave to fish. That property, which is public property, ought not to be allowed to lie unproductive; it should be made to yield revenue, or perhaps something better than revenue. Two courses are open to the Commissioners of Land Revenue, besides the course pursued previous to the decision declaring the property to be the Crown's, and which it would be absurd and unjust any longer to continue. They may sell or let to the highest bidder all the coast still belonging to the Crown, whether or not previously fished; and so, for a time, obtain a great revenue for the department, though to the ultimate injury of the general interests of the fisheries, and of each particular interest, that of the department included. Or they may intimate to the proprietors who have grants of fisheries on the coast, that if they consent to put down their fixtures, and return to the modes by which they originally fished, and by which alone other proprietors are allowed to fish, the Crown will do the same over all the coast which it still retains, and perhaps will engage not to fish in any way at least those parts of the coast that have heretofore not been fished at all—with certification that, if the fixed-netters will not consent to this compromise or mutual concession, the Crown will hand over every inch of its coast to the highest bidder, to be fished as they fish, which would very soon leave them nothing to fish for. That this result can be brought about, at least in a great many localities, is clear, by its

having in many cases been brought about already, through the application of much smaller means than are at the command of the Crown. Some of the fisheries on the the Moray Firth, at which fixtures were earliest used, have been brought to worthlessness by the increase in the number of their neighbours; and after the first stake-net erected on the coast of Aberdeenshire had raised the rental of that fishery from a mere trifle to £300, the erection of similar nets in the same district had the almost immediate effect of bringing back the rent of the first offender to a trifle again. With such examples before them, it is reasonable to hope that the fixed-net fishers might concede to fear what they have not unnaturally refused to fair-play, or at least that so many of them might thus become reasonable on compulsion that the passing of an Act satisfactorily settling the whole matter would become easy and certain. At all events, it is only fair and well worth while to try, especially as even failure would be gain, by allotting the necessarily temporary profits of the bad system to the public instead of to individuals, while at present there is a class of men virtually paid with public money to injure the public interests.

Scarcely less important than the suppression of fixtures used for capture and obstruction—in a large view, even more important and more urgent—is the question of legislation for the prevention and cure of pollution and poisoning in all running waters. The question here is not merely whether we shall preserve our fish, but whether we shall preserve our rivers—whether our rivers

shall be rivers or sewers, beauties or deformities, pleasures or plagues.

There is, however, a possibility worth guarding against, that a separation may be made in legislation and in popular discussion—as indeed it has to some extent been made already—between that kind or degree of pollution which destroys fish, and that kind or degree which destroys rivers in other respects. In this case, rather unluckily, the general question of the purification of rivers does not quite necessarily include the perhaps smaller question of the preservation of fish, nor does the preservation of the fish quite necessarily include the purification of the rivers. The fish, or at least the salmon, in a river may be to a great extent preserved, and yet that river be a public nuisance ; and on the other hand, the public nuisance may be greatly abated by means destructive of the fish. The existing fishery laws have clauses prohibiting the putting into rivers of any liquid or solid matter destructive of fish, but interfering no further ; whilst there is at present a visible danger that those interested in the purification of rivers on other grounds than those relating to fisheries may seek, as in some quarters they are already seeking, to attain their ends by means which, saving the noses and in some degree the health of the public, would bring the fish to sacrifice.

The English Fisheries Act imposes penalties upon “ every person who causes or knowingly permits to flow, or puts or knowingly permits to be put, into any waters containing salmon, or into any tributaries thereof, any liquid or solid matter, to such an extent as to cause the

waters to poison or kill fish," unless he can prove that he has "used the best practicable means, within a reasonable cost," to render the matter harmless. The clause in the Scotch Act is almost precisely the same, but specifies saw-dust among noxious and prohibited matters. There is no doubt that much harm is prevented by these clauses on some salmon rivers ; but, besides that they do not apply to rivers not containing salmon, it will be noted that even in salmon rivers they do not apply to any kind of pollution or nuisance which is not absolutely poisonous to fish. So far as the clauses in the Fishery Acts extend, a river may give out offensive stench through all its course, and yet escape the law, for it is found that ordinary town sewage, though most offensive to men, is not fatal to fish. "It has been clearly shown," said the English Commissioners of Inquiry, "that a very considerable amount of pollution may exist at certain points in a river without destroying the salmon or preventing them from passing up to spawn, provided the upper waters are favourable for that purpose, and that no artificial obstructions bar their way." In this way, the fisheries might be preserved, and yet the public nuisance remain. It is true that in various Acts, both English and Scotch, there are enactments against the poisoning of rivers in other respects : for instance, the Scotch Removal of Nuisances Act (1856) imposes a penalty of £50 on "any person engaged in the manufacture of gas, naphtha, vitriol, or dye-stuffs, or in any trade in which the refuse produced in any such manufacture is used, who shall at any time cause or suffer to be brought or to flow into any streams, etc., any washing

or other substance produced in any such manufacture, or shall wilfully do any act connected with any such manufacture whereby the water in any such stream, etc., shall be fouled." This enactment has in some cases been beneficially put in operation, and the English Inspectors of Fisheries report (1863) that, under similar enactments in England, a great deal of pollution had been prevented, and some cured, not only without loss, but with considerable profit to the manufacturers, especially gas manufacturers and papermakers. There is, however, a great want both of uniformity and effectiveness in the laws relating to this species of nuisance, and as the nuisance is daily growing greater, the need of a general and effective law is daily becoming more felt and more clearly expressed.

There is here a little danger, as well as a great opportunity. There is the danger that those whose chief object is only the suppression of bad smells may consent to attain their object by some means, such as the discharge of chloride of lime, which, though depopulating the rivers, might lessen the evil to the dwellers on the river-banks. There is a great opportunity to all concerned, whether for property, or sport, or health, to make common cause against a great evil, which every day becomes not only greater, but more difficult of remedy, and which already has attained such magnitude and is invested with such difficulties that redress is not likely to be obtained by any means short of an employment of all the strength that can be obtained by the efforts of special interests, combined with the action of public opinion.

It is encouraging to perceive (though, as we shall see, there are local cases to the contrary) that some at least of the leaders in the causes both of Sanitaryism and of Fishery Preservation are awaking to the propriety and importance of making common cause in this matter. Lords Ebury and Shaftesbury, "on behalf of the sanitary associations of Great Britain," have united with Lord Saltoun, the President, and Lord Llanover, the Vice-President, of the Fisheries Preservation Association, in addressing a statement to Lord Palmerston, in which they set forth the magnitude to which the evils have attained, and the necessity for immediate legislation, directed to preserving alike the health of men and the lives of fish.

That the pollution of the rivers of the country is so great and general as to have become a national evil, was the conclusion arrived at several years ago by the Royal Commissioners on the Sewage of Towns,—a conclusion arrived at without any reference to the interests of the fisheries, but solely with a view to the public comfort and health; and when the interests of the fisheries are also taken into consideration, the evil appears still greater and still more truly national. This evil may be regarded as presenting itself in two forms: in some instances, inland towns send their impurities through far-stretching rural districts; in others, the villages and manufactories on a river send down stench and pestilence on great seats of population below. The great and unpleasant question whether it is necessary or endurable that all the rivers of the country should be transformed into common sewers, has been raised earliest and as yet chiefly in the

former class of cases—and even in that class by causes which are comparatively new. The evils in this respect, arising from the increased and ever-increasing size of our inland towns, and the great though yet but commencing change in domestic arrangements, and in the system of draining and sewage, may be said to be almost new things, at least on the chief rivers frequented by salmon ; but they are growing rapidly, and are in their nature difficult and sometimes impossible to arrest, unless taken in their beginnings. Till lately, our large towns were chiefly (in Scotland entirely) on the coast, or within tide-reach on some estuary or navigable river, and their drainage went off to the sea with comparatively little harm or offence, except in such extreme cases as London and perhaps Glasgow. It was assumed, too, that this state of things was permanent and unalterable. About sixty years ago, a traveller (Rev. James Hall), beginning an account of his tour through Scotland, thus refers to the considerations which determined his choice of route : “ There never was and never will be any thriving city or village at a distance from water-carriage, and every large city or town always has been and always will be situated either on the sea-coast or on the banks of some navigable river.” But now the railway system, with its cheap and rapid carriage of materials, goods, and fuel, is enabling manufacturing towns to rise in far inland localities, and the fact is gradually appearing that such towns, sending their drainage for scores of miles down the rivers, do, or at least will, create a really national nuisance—a nuisance greater than that produced by towns many times their size situated within the cleansing influences of the sea-

tide. Take the Tweed for an instance. The woollen manufacturers on the banks of the Tweed and its tributaries now make almost no use of the wool produced on the hills overhanging their own tall chimneys, but bring their materials from Saxony and Australia, their coals from the Lothians and Northumberland, and find their markets over all the world; what has been done there can and we hope will be done in other inland districts; and we rejoice to see Hawick, Selkirk, and Galashiels already on their way to be Bradfords and Halifaxes. But contemplate the results of having large towns fifty or sixty miles from the sea—with contributions from every village and even farm-house—sending their whole refuse down the river-channel through five counties! Look at what the Tweed is now, in contrast with what will be its look and smell at that not distant *then*. See her and hers rolling along, beautiful and beautifying, through regions where every ruin is history and every glen is song; gathering her tributes from a thousand hills—from where sweet Teviot sings unceasingly its “Farewell to Cheviot’s mountains blue;” where pensive Yarrow winds like a silver chain amid “the dowie dens;” where, in the sad and silent “Forest”—

“The wildered Ettrick wanders by,
Loud murmuring to the careless moon;”

till, grown stately, massive, and brimming, “Tweed’s fair river, broad and deep,” wheeling beneath the donjon keep of Norham and the battlements of Berwick, sinks into the ocean as glittering pure as when she broke away from her native hills. Is all this to vanish, and in its place a pestilential sewer? Is that which now spreads

health and beauty around, to become an eye-sore and a nose-sore extending over half the breadth of the Island? Shall the turrets of Abbotsford be reflected from a monster gutter, all stains and stench? Shall fair Melrose, instead of being "viewed aright by the pale moonlight," be nosed in the dark? Forbid it, all the powers of Parliament! If indeed that prohibition could not be uttered without destroying or impeding the brisk and cheerful industry which has sprung up among those sweet hills, there might be nothing for it but to sigh and submit. But it would be almost profane to doubt that from so great an evil there must be means of escape—that Hawick may prosper and yet Tweed be preserved. The manufacturers in great towns have already been made to consume their smoke, and the time seems coming when compulsion to the same effect will be applied even to London householders—when even "the sacred domestic hearth" shall be invaded by the officers of Sanitaryism. The Londoners have agreed to impose upon themselves a vast expense, in order to cease making a sewer of their own Thames; and can it be doubted that if the people of the towns on the Tweed and other such rivers shall fail to find the *will*, there will be comparatively little difficulty in the Legislature finding the *way* to prevent their doing what they unhappily like with a river which is *not* their own, but is the property of five counties, and the pride of Two Kingdoms?

Nor, as already said, is the case one in which the towns are always the offenders, and the rural districts the sufferers; sometimes the position of the parties is reversed, and country gives town as bad as it gets.

When a river, near its mouth, runs through a great town, as most rivers do, all the polluting and noxious matter, liquid and solid, sent out from the dwelling-houses and manufactories of the country above, comes past the doors of tens or hundreds of thousands of people, who probably are successfully labouring to protect themselves from themselves, but find it difficult or impossible, as it is certainly very hard, to protect themselves from their neighbours. In at least one view, there is even a greater injustice in this case than in the other; a populous inland town may be said to have more natural right to send its nuisances through thinly populated rural districts, than thinly populated rural districts have to take the same improper liberty with a great sea-coast town. In illustration of this, as of the other form of the evil, take an actual instance. The great towns of Edinburgh and Leith, having the same small river running through both, lately agreed upon costly measures to keep the open water-course free from the town sewage. It was found, however, that, owing to the presence of villages and manufactories farther up the stream, the water came into the precincts of the city in an impure and noisome condition. Consequently, or naturally, it was proposed that the few people above, or at least the manufacturers, should take measures to the same end as the many people below; that, when 200,000 people were subjecting themselves to trouble and taxation to rescue a river from the condition of a nuisance caused by the multifarious occupations of two large towns, those efforts and sacrifices should not be neutralized by the neglect of a dozen or two of people beyond the

towns to do likewise, for their own as well as their neighbours' good. It was pleaded, however, for the people above, that while they discoloured and defiled the water, they did so with ingredients which, though certainly rendering it poisonous to man, beast, and fish, yet prevented, killed, or cured stench, and might be made to operate more efficaciously to that end. This plea was practically allowed, neither party taking any account of the fact that the ingredients (chiefly chloride of lime) which are most effectual to prevent stench arising from the water, are also most effectual to produce death to everything under or even upon the water. Multitudes of similar cases elsewhere may possibly be settled in a similar way, the public in the matter of rivers contenting itself with saving its nose, to the deprivation of its mouth and the damage of its eyes, to say nothing of what there is much to be said about, the extirpation of all the creatures to which the waters have been given as a dwelling-place. It is a compromise which should be discountenanced and resisted in the interest not only of fish, and of all who catch fish, but of all who eat fish, and all who value either the beauties or the edibles which nature has provided. It is a device for making a solitude, and calling it purity; for depriving rivers of life, and boasting that there is no corruption in their wretched remains. Thus to kill or depopulate rivers may be denounced as a violation of almost everything sacred; of justice, for it robs some men for the convenience of others; of reason, for it is perpetrating an injury which is at once enormous and avoidable; of nature, and even of religion, for the command is, that the waters shall bring forth abundantly.

Nevertheless, some people venture to say that the infliction of sterility on the waters by artificial means is natural, because river-courses are the natural drains of the country, and because thus it is natural that all dirt should descend through these drains. But there is neither proof nor probability as to this being a correct interpretation of the designs of Nature in the making of rivers; and though it were otherwise, the fact would not be much to the purpose. Nature, we beg to suggest, intended river-courses for rivers, and rivers are naturally composed of water that rises from the ground and water that falls from the clouds. There is no written proof nor visible probability that Nature designed river-courses as conduits or open sewers for the running off of lime, soda, and vitriol. On the contrary, there is good evidence that Nature intended rivers, among other good purposes, to furnish a supply of drink to man, beast, and bird, to say nothing of fish; and it is a fair inference that whatever renders rivers unfit for so obvious and great a purpose, is a violation of the designs of Nature. Indeed, it would be quite enough to say that Nature, beyond all doubt, designed rivers to be the habitation of fish; and that if lime, vitriol, soda, and filth are incompatible with fish, it is not the fish, but the filth, that is out of place. But suppose it proved or likely that Nature had any such grotesque and inconsistent design as is so unwarrantably imputed to her, it is sometimes necessary, for the preservation of life and for other good and sufficient causes, to counteract or neutralize even natural operations. People do this habitually in personal and domestic matters, and even in this very matter of

drainage, so far as it is personal or domestic. It is natural for the efflux from a dwelling-house to go down the slope; but if that slope happens to lead through the householder's grounds or garden, or past his windows, he is careful to cover up the stream from sight and smell, till, and only till, it reaches a spot where he can distribute the nuisance among his neighbours. Whenever the filth reaches the river or natural water-course, some people seem to think it becomes innocuous or almost sacred, though in truth it has only become an injustice as well as an evil, and has acquired a thousandfold greater power of mischief. Why do people thus refuse to let "Nature" have her way with their own noses, and then argue that it is right and necessary that she should be left free to take her will of the public nose? Just because "what is everybody's business is nobody's business"—because everybody has been looking after himself, and nobody after the public. The importance of the neglect is now, however, beginning to be discovered, and both communities and the Legislature seem more than formerly inclined to attend to a business much more important than many things regarding which there is much making of speeches and of laws.

The past neglect as to the polluting and poisoning of rivers is the more remarkable that there is no want of precedents for legislative protection and restriction in matters of the same class. Take the case of the poisoning of the atmosphere. It is at least as natural for smoke or fumes to rise into the air as for poisonous and stinking substances to fall into the waters. Yet the law compels all manufacturers, or others who send forth

offensive or injurious smoke and smells, either to render their effluvium harmless by means of gigantic chimneys, or to consume it on the premises. Since gigantic manufactories are thus trammelled and burdened to prevent their deteriorating the atmosphere in their immediate neighbourhood, is it not equitable and reasonable that similar restrictions should be laid upon those who not only deteriorate but poison the waters of many neighbourhoods besides their own? When the law puts restraint upon those whose operations could only injure the hedges and herbage of three or four fields, why should it give license to those who inflict loss, ugliness, and disease on as many counties?

CHAPTER VI.

NON-LEGISLATIVE REMEDIES.

Domestic Breeding and Rearing—Fish, Flesh, and Fowl—Revolution in the Fish Market—“Peace, Reform, and Retrenchment.”

ADDITIONAL to all that has been done, or may or need be done, by the Legislature, are two vastly important means of increase and improvement, regarding which the salmon-fishers can, if they choose, act as their own legislators. These are—Better Nursing, and Cheaper Fishing.

In the application of one of these means, a good beginning has already been made, and the whole of that subject, of which unluckily salmon does not form the greatest part, is obtaining a large share of public attention and favour. Of all the “movements,” indeed, in this age of movements, there are few more important than that which has for its object the increase of the supply of food by the propagation and better culture of fish. It is amazing that the subject has so long lain in neglect, especially as in ancient times, when such matters had much less interest and importance, a good deal was both known and done, the monks of old having laboured to improve the breeds and increase the produce of fish, as carefully and almost as successfully as is now done

in the case of fowls. And why should fish be neglected when so much care and cost are bestowed upon its concomitants? Or, to take the question in a larger view, is it not an ascertained fact that water, as well as land, is capable of cultivation by man, so that, in some cases, a piece of water may, by artificial means used in aid of nature, be made as much more productive than it was before the application of these means, as a field ploughed, sown, and tended, is more productive than was the same field in a state of nature and neglect?

Yet even those supplies of fish which nature offers man merely for the taking, have been strangely little thought of, and almost altogether uncared for, either as to saving them from waste and destruction, or as to increasing the supply proportionally to the increase of the demand or need. There are few objects regarding which both the Legislature and those engaged in the various modes of production have of late years done or attempted more than the increasing and cheapening of vegetable and animal food; with the result, not indeed of failure, but neither certainly of quite keeping supply abreast of the rapidly advancing demand, or producing all the plenty and the cheapness that some hoped, and some feared, and almost all expected. But whilst legislative changes, and the progress of our own agriculture, have, during the last quarter of a century, made immense additions to the food of the population of the United Kingdom, yet it is a fact that (with the recent and temporary exception of wheat) food was scarcely ever so steadily high in price,—a fact which is of itself sufficient to indicate the wisdom of leaving no source of supply

neglected. The ports are open to the produce of all the world, foreign cattle and sheep come in annually by hundreds of thousands, foreign pork, hams, beef, cheese, and butter by millions of cwts., foreign corn and flour by tens of millions of bushels ; and even all that is but a bagatelle to the additions recently made to the supplies both of grain and animal food, through the extended cultivation, improved methods, and greater enterprise and expenditure of our own agriculture. Yet, after all, here we are, with beef and mutton at 10d., and butter at 1s. 4d. the pound, or not greatly short of double the prices to which many of this generation were at one time accustomed. All this while, it seems to have been forgotten not only that man does not live by bread alone, but that there is a variety or many varieties of food called fish, which in popular colloquy has always been thought not unworthy to be classed along with flesh. "Fish and flesh" have generally been regarded as both though perhaps not equally good things ; but whilst laws, capital, and skill have been busy promoting the production of flesh, the kindred commodity has got but little attention from the law, and still less from capital, skill, or even industry—or at least the efforts to increase the supply have been utterly ridiculous in comparison with the enormous extension of the market.

It has been too little noted that whilst the demand for fish has received great increase from the improved condition of the mass of the people and the dearness of other kinds of food, the available or reachable market, at least for fresh fish, has within not many years been entirely revolutionized, or rather has received an almost

indefinite extension. It may be said that, until a few years ago, the consumption of fresh fish was almost entirely confined to the section of the population on or near the sea-coast, and indeed chiefly to the proportion of that section living in towns or easily accessible villages. The expense, and still more the *time* of inland carriage were almost insuperable obstacles as to the great mass of people. The railways have revolutionized all that, and, by cheapness and quickness of carriage, have made sea-fish a comparatively common article of diet in the most inland districts. To take an illustration from our own neighbourhood, the picturesque fishwives of Newhaven and Fisherrow are now almost as familiar spectacles in such towns as Selkirk and Hawick as in Edinburgh or Leith, going with full "creels" by the morning trains, and returning with full pockets in the evening. Nor is it only the interior of Scotland that has thus obtained a share in the benefits formerly almost monopolized by the dwellers on the shore—the Scotch coasts are made to supply even the farthest parts of England. Thus all but a fraction of the fish landed at the numerous fishing-towns in the east of Fife are (or lately were) carried off by steamer and rail to Liverpool, Manchester, and London; and any man looking about him in Birmingham, Nottingham, and others of the most inland towns of England, will see in the fishmongers' windows grounds for a conclusion, which a talk with the fishmongers themselves will confirm, that the people of those regions are more prone to the consumption of fish, and especially of sea-fish, than the people nearer the coast, who had been accustomed for generations to obtain with ease what has

only of late been brought within reach of the dwellers in the interior. It would seem, indeed, as if a natural appetite had acquired additional strength from long and compulsory disuse. One effect, of course, is an *equalization* of price, under which the chief gainers have been the better-off people of the interior, and the chief losers the poor people of the towns near the coast. Formerly, sea-fish may be said to have been unattainable either by the middle or the poorer classes in the interior, but obtainable even by the poor classes near the sea. Now, by the cheapness and quickness of carriage, the article has in the interior been brought within reach of the middle classes, but, by another part of the same operation, has, in the coast districts, been raised above the reach of many or most of the poor. Further, in comparison with this extension of the market, there has been no adequate effort to increase the supply ; and it is to be feared that such efforts as have been made have been rather in the way of more severely fishing the old ground than of finding or using new grounds. It must be admitted that there are considerable difficulties as to a more effective and systematic working of the sea-fisheries—such as the employment being mainly that of a peculiar people, not apt at new methods, not much available to capital and organization, and not admitting of any great increase in numbers ; also, our comparative ignorance of the habits and habitats of sea-fish, and the impracticability of much care or control over them. Still, it is matter of surprise that, in this country, with capital so often in want of outlets and so often running desperate risks, something more should not have been and is not

even now to be attempted in this department, to bring nearer to a demand which has so rapidly increased a supply which is drawn from a free and almost limitless source.

As to the fresh waters, matters have been still worse, and with less excuse ; for, besides having only now begun to think of aiding or supplementing the operations of Nature, we have been carelessly and wantonly counter-acting her. The rivers and lakes are more within our vision and within our power than the sea. Yet there, where should lie the advantage, has lain the evil. The comparative power we possess over the inhabitants of our fresh waters, has been used to their destruction and our own loss. We have neglected the seas, but happily to a large extent we have not been able to abuse or desolate them. But in the rivers and lakes, filled by Nature with valuable food, requiring neither cultivation, nor manure, nor feeding—requiring nothing, in fact, but to be spared during the season when they are multiplying their species, and when they are worthless anywhere but in the water,—we have, partly from greed, partly from ignorance, partly from the operation of certain popular prejudices, been willing, as we have been able, grossly to abuse our bounties. One reason why the public has been so neglectful of its interest in this matter is, that what is really the main question regarding our rivers and lakes—the obtaining from them of a supply of food—has been almost lost sight of amid the frequent controversies between interests conflicting with one another on matters which, to a superficial view, did not much concern the public. People concluded that a matter about which

certain parties fought so fiercely, each for its own hand, could concern only the parties so very much interested ; and especially an idea has grown up and prevailed, that questions about fisheries are mainly questions, not for the consumers, but for the amateur catchers, of fish. Because it happens that some fish, besides affording nutriment in the eating, afford also amusement in the catching, a great many persons conclude, when they hear about fish and fisheries, that the subject is one for sportsmen ; and from that conclusion they proceed, under the stimulus of a feeling derived from the abuses of game-preserving, to the further conclusion that any proposal for the increase of fish is a thing to be discouraged. This feeling is so strong in many quarters, that it is pretty certain that if it had been practicable to extract "sport" from the shooting or chasing of sheep, sheep would in many quarters have been denounced as "vermin," and the stealers of them have been popularly regarded as a species of irregular or illegitimate benefactors of the community. But all this is a mistake ; the public have an interest of the same kind, and of scarcely smaller degree, in the increase of fish as in the increase of flesh or corn. That interest has, till of late, been much neglected by the Legislature ; the neglect has been partly repaired ; and now has arrived another question, whether, besides refraining from hindering Nature, man cannot, in the production of this as of other kinds of food, easily and greatly help her.

Water as well as land was designed to provide food for man ; and not only is there no reason why man should destroy the one source while laboriously fostering the other, but there is no obstacle in Nature to water

being, like land, rendered immensely more productive by the appliances of art or skill. Water may, in truth, be said to be naturally more productive than land—many kinds of fish, including the most valuable, reproduce their kind by tens of thousands per pair every year; but in this fact must be recognised, too, a provision of Nature to compensate for the incomparably greater waste or destruction which afflicts the inhabitants of the water than at least any useful species upon the land. The fact, however, that Nature, for whatever ends, has made the water more prolific than the land, is no reason at all why man should reduce the water to sterility while making such efforts to maintain and increase the fertility of the land; nay, should even destroy the water with what might further enrich the land. For it is a fact, that whilst the utmost that skill, capital, and labour could do has been done for the land, not only has nothing been done *for* the water, but a great deal has been done against it; and especially, enormous mischief is done by materials that should be kept to give fertility to the land being sent away to inflict sterility on the waters.

At last, however, something is being done for the water; the discovery has been made, or re-made, that man can, by enclosure and cultivation, do perhaps as much for fish as he can for plants. Pisciculture, or the cultivation of fish, is now a great industry in France, and is beginning to assume large proportions even in this country. To narrate all that has been done would be here quite out of place, for our topic is only salmon, which, as a migratory fish, must always form a separate or special, if not a comparatively small department of this new

industry ; besides which, the subject is treated with the care and minuteness it requires in the recent volumes of Mr. Frank Buckland and Mr. Francis Francis. There is no dispute, however, as to the fact that the results in France have been great ; there is not the slightest reason to doubt that they will be proportionally great here ; and that those who have laboured and are labouring to increase and improve this mode of producing food, are labouring for a great public good. If he is a national benefactor who makes two blades grow in place of one, what shall be said of him who makes ten thousand fish swim where only two fish swam before ?

Of course, as in all other things, and especially in all the beginnings of things, there have been and will be some mistakes—chiefly, as we think, in the matter of acclimatization, or the transplanting, so to speak, of the fish from one country or district where it is indigenous to another where it is exotic. To populate where the inhabitants had become extinct or scarce, is quite a different thing from bringing in some new race among a piscine community already sufficiently numerous for the local means of livelihood. In waters not actually poisoned, or otherwise artificially desolated, the number or amount of *resident* fish is, generally speaking, regulated by the amount of food ; and to bring more fish to a river so conditioned does not in the end really operate as an increase of the quantity of fish, but only as a change of the kind. In many cases the change may be for the better ; in all cases where it is practicable, it would be well to cultivate salmon and trout, for instance, to the displacing of chub and perch. But sometimes we see an opposite course adopted, and

other important considerations overlooked. Thus, the late experiment, in one sense quite successful, of introducing grayling into the upper portions of the river Clyde, is open to grave doubts. It may fairly be assumed that the supply of trout in the Clyde was up to the supply of food, or at least if it were not, it was owing to injurious causes to which grayling will be equally liable; so that to introduce grayling was practically to make a proportionate diminution in trout. Now, the grayling, though a good fish, is not so good a fish as the trout, and so the exchange was for the worse. Then the grayling is a fish which is in season during winter; and though angling at Christmas may do very well in Devonshire, or the other natural habitats of the grayling, it would be both an unpleasant and unproductive employment in the Upper Ward of Lanarkshire. Finally, when grayling are in season, trout are spawning, and *vice versa*; and, as the two species have the same haunts, the same process will, almost all the year round, be effective in slaying alike the clean and the unclean, and any law that may be made to the contrary will be of no effect.

There can, however, be no mistakes of this class as to the artificial introduction or rearing of salmon in any river; for, besides that the salmon is not a formidable competitor with any other species as to food, it is the most valuable and desirable of all fish. Of course there is, in the case of salmon, the heavy drawback arising from its being migratory and vagabond in its instincts and habits; but still much can be done, and not a little has been done, to increase the stock of salmon by semi-artificial propagation and semi-domestic rearing. It is

obvious that salmon *ab ovo*, and before that, up to the age of puberty, are, in their natural abodes, exposed to very great perils, the chief of which may be classed as preventible. Thus, there is enormous loss by spawn being deposited during floods, when the rivers are high, in positions where, when the waters fall, it is destroyed by frosts or drought, or trampled under foot of man and beast; an evil of late very greatly increased by the extension of land drainage, especially the hill or open drainage, which causes the rivers both to rise higher and to sink lower and more rapidly. Then great quantities of the ova are devoured by fish and birds; and after the fish are hatched, their dangers from other sources, up to the period of their seaward emigration, are still greater. These and sundry other evils can be avoided, to a great extent, by semi-domestic rearing; the eggs can be preserved from accident, and the young kept separate from their natural enemies until the time comes when they themselves think they have sufficient strength and knowledge to seek their fortunes abroad. The extent to which the preventible evils operate, and to which they may be cured, cannot be stated with precision, but enough is known to indicate, with considerable certainty, that a very considerable work of restoration may be accomplished. Sir Humphry Davy's estimate was that, on the average, each salmon deposits 17,000 eggs, of which only 800 come to perfection; and although even his authority on such a point is not decisive, we have nothing better. Then as to the destruction from various causes that takes place after the hatching, we may form, though not an arithmetically accurate, a sufficiently clear and *large* idea,

by merely reflecting for a moment on the fact (after making all allowance for the number killed by man), that a fish which multiplies itself eight hundredfold every year is yet saved from rapid decline only by a great amount of legislative protection and favour.

What breeding-ponds have already done and have shown *can* be done, in applying a remedy at this point, is striking. The ova deposited at Stormontfield in the first year (1853) were 300,000 ; the fish hatched and brought up to the migratory age were, according to the best census practicable, about 260,000. In other words, while (accepting Sir Humphry's statement) only one in twenty of the eggs deposited in the natural spawning-beds are hatched, the proportion hatched of those deposited in the artificial ponds is something like nine in ten. Similar results have been obtained at Stormontfield in each year of the last ten, or rather in each alternate year, there having been, until lately, only one pond, and it having for some years been held desirable, owing to the fry of each propagation departing in two different years, not to introduce a new brood into the pond till all of the former brood had departed. By the five or six hatchings which have taken place at Stormontfield, nearly a million and a half of smolts have been furnished to the Tay, only a small though unascertainable proportion of which would have reached that stage had they and their parents been left to the natural or ordinary chances of the open river. It is not practicable to ascertain the extent to which these operations have contributed to the great rise in the produce of the Tay fisheries which has taken place within these few years, for other beneficial

causes, such as the lengthening of the close-time, have been at work during portions of the same period. A similar remark applies, in a less degree, to the more extensive operations carried on in Galway by Mr. Ashworth, who, since he resorted to transplanting and artificial rearing, along with better protection and other such appliances, has found the produce or annual capture of his fisheries to have increased no less than tenfold.

What the system of nursing and protecting the young of the salmon till reaching the migratory stage can do is plain enough, though not capable of exact measurement : it affords almost entire protection from the dangers and destruction which beset eggs lying exposed for months to floods and frost, and beasts, birds, and fishes of prey, and also from those which beset the young fry, exposed for more than a year or two years of the most helpless period of their existence to hosts of devouring enemies, human as well as inhuman. What proportion of the enormous destruction which undoubtedly befalls the salmon race between birth and marriage accrues during the period in which the race can be thus cared for, cannot be ascertained ; but it is certain, and it is enough, that the loss or waste during that period is stupendous, and the gain or saving of semi-domestic rearing proportionally great.

What the system cannot accomplish, is equally obvious—it cannot, as things stand, do much or anything for the fish after the age of infancy. And this is not only a great drawback in itself, but it tends powerfully to produce difficulties and discouragements as to the doing of what can really and beneficially be done. One

man breeds, and another catches ; one man pays, and another profits. If the fish bred and nursed in ponds could also be reared till near their full growth, under the care of man, and for the profit of those who had been at the cost of breeding and caring for them, we might look with certainty for a great and rapid increase in the number of salmon-nurseries, and for proportionate results visible in the rivers and in the markets. But the peculiarity of pisciculture as applied to salmon—which has not been sufficiently taken into account by those who have drawn inferences from the great success attending the stocking of certain French rivers with non-migratory fish—is, that, as soon as you have brought your brood past the perils of birth and infancy, you must let them forth to the world of waters—“the world not their friend, nor (sufficiently) the world’s law”—without the thousandth part of a chance that they will ever return to reward their early benefactors. “Upon the river Thurso,” said Mr. W. Dunbar to the House of Lords Committee, in 1860, “I have artificial ponds, and have had for some years, for the purpose of increasing the fish ; and then these men put in their bag-nets, and catch the fish which I have reared with the greatest care in the world, before they come up to me.” And obviously this must be the common case. The obstacle, however, is at least in part removable, if it were possible to devise and enforce any system by which the salmon-trade could be made to act with some degree of concert and co-operation—as indeed it does on the Tay as to this one matter of breeding-ponds—instead of its members striving, as at present, which shall do

most towards the extermination of the means whereby all of them alike have their living.

That such a system can be devised, or rather is lying ready, but unused—that a vast reformation can be wrought in the whole business of salmon-fishing, with large profit to all concerned—is, we submit, a great fact, and easy of demonstration ; though, like most great truths or discoveries, there is difficulty in getting it audience. We hold that the whole present system of net-fishing for salmon proceeds on a false plan, bequeathed from times of which the circumstances were quite different, and that it performs expensively and ill what might be performed cheaply and well. At present, those who have a common though not an equal interest compete against each other under artificial restrictions—or, so to speak, run a race against each other, each runner heavily weighted, for a prize which belongs to and ultimately goes to all of them in proportions as ascertainable before as after the race. What we propose is, that competition should cease, and that there should come in its place amalgamation or co-operation.

The present system is a *scramble* : each man having a few yards of river bends his efforts to catch as many fish as he can ; and the grand object of all the innumerable and complicated laws on the subject is to prevent his efforts from being too effective. This is a system of very natural growth ; but it has now grown to be a great and unnecessary evil and an anachronism. The proportionate value of every man's rights in any river is now accurately ascertained : why should not all the

owners on any given river form themselves, as it were, into a joint-stock company, this man having a fourth share, and that a fortieth, and then proceed to fish the river in the way best for all of them considered as one interest, and divide the money proceeds among the shareholders according to the number or proportion of their shares? More specifically, our radical reform is this,—to erect or work in each river, at such place or several places as might be most suitable, some engines which shall, during periods properly regulated and restricted, take possibly every fish which ascends to them, or allow all to pass, dividing the expense and the produce among the proprietors of the fisheries in the proportion which the present value of the fishery of each bears to the present value of the whole.

That such engines are quite possible, there is no doubt; indeed, the whole aim of legislation hitherto has been to prevent the erection of anything resembling them. Keeping, then, this fact in view, how foolish and wasteful the present system appears when scrutinized! The salmon does and must travel for the whole extent of his fresh-water journey along a road, so to speak, of a few yards wide. In many cases, we can at some part or parts of that road erect a bar or pit-fall, by which we may, when we wish, infallibly catch him, or through which, when it suits our end, we may let him pass unmolested. But instead of that, we prohibit all such bars, and set some hundreds of men at some scores of stations to make shots at him as he darts past, shooting, too, be it remembered, in the dark. There is nothing analogous to this to be found anywhere, keeping in mind

that the killing is for profit only. It is as if a warrener should come among his rabbits with hundreds of beaters and terriers, instead of quietly placing his traps at the mouths of the burrows. Nay, that is but a feeble similitude ; for there are hundreds of holes in the warren, and but one passage in the river. Although salmon-netting is not performed for sport, it really amounts, when examined and described, to a very costly, unnecessary, and unamusing fish-hunt.

For an instance, follow the process of catching, or failing to catch, a Tweed salmon. Descend a few minutes into the German Ocean, somewhere about Holy Island, and accompany a short way an individual of the species *Salmo salar*, on his return, after months spent in the deep hiding-places where neither human eye nor human knowledge has ever yet been able to follow him. And who can regard him without interest ! He is on his first return to his native place, far up in “bonnie Teviotdale,” or among “the dowie dens of Yarrow ;” and (which is more important to the present subject of discourse) he is on his marriage-jaut. But he is in haste. Onward he goes—bump on the first of thirty standing-nets which festoon the beach of Goswick. By extraordinary good luck, he gets past the traps—and out among the waiting seals and porpoises. After a sharp run, this fortunate and coveted fish escapes into the mouth of the river,—and whiz ! goes a “net-and-coble” before his nose, ere he has enjoyed two minutes of the fresh water. During his first hour’s possession of his new element, or three miles’ progress, the same attempt has been repeated somewhere about a score of times. A

change in the sport is then offered for his amusement. The shooting is no longer done at random, and he sails upwards thinking he has left all the fun behind ; but chancing in his careless happiness to show a fin or make a ripple in passing a "ford" or shallow, a resounding "Pow !" (which is the Berwick or Northumbrian euphemism for *pull*), proceeds from the watcher, and a boat's crew, rushing from the sheiling, shoot a net right across his passage, beyond him and around him. Again let us imagine him to be in luck, and to pass in this exhilarating manner upwards of fifty stations, each of them with two nets, to say nothing now (for they have lately been removed) of some ninety cairn nets, which, at every spot where he was likely to seek rest, were set up for his reception. This brings him as far as Coldstream Bridge, where we shall leave him to cleave onward to new dangers, for he is only "saved to-day, to-morrow to be slain"—to fall by the rod of a Duke at Kelso, or (which is at least quite as likely) by the leister of a weaver at Peebles. But what is the summary of his career thus far ? He has roused to the chase 350 men ; there have been expended on him, in wages and materials alone (such is our careful calculation), at least £10 ; he was worth 2s. 1d. ; and he's off !

This, of course, is an extreme case ; take, then, one of an opposite character. Instead of a single fish, a shoal, or, as it is technically called, a *head* have come up. The same engines are set to work, but with great success. Out of 500, 490 are captured, and ten make their way onward, five (say) to be killed by the Dukes or the weavers (we are stating fairly, from statistics,

the proportions killed by the net and rod), and five to spawn ; and the same thing is possibly repeated, tide after tide, for weeks. Compared with both of these extreme cases, and with all conceivable cases, our plan assuredly would be an immense improvement.

Such engines as we propose, and as are known to be perfectly practicable, would neither expend money and labour in a blind and unsuccessful attempt to take a single fish, nor slaughter all that entered for a week, without regard either to the interests of those above, or to the providing of a supply for the future. They would, under such regulations as should be agreed on, capture all within a certain proportion of time, and let all go free within the remaining proportion. And they would do all this at a mere fraction of the expense of the present more harmful and less productive system. On the Tweed, the cost of labour and materials absorbs about two-thirds of the selling-price of the fish. That is the cost of fishing the river by fifty stations. Our plan might possibly work it by *one*, and certainly by very few. And it must not be supposed that the Tweed is an unfairly selected instance. On the contrary, if we had taken the Tay, where there are between eighty and ninety stations, with two boats and two nets at each, we should have brought out results at least as effective for our purpose.

In dealing with the various interests concerned in such a change, we foresee no difficulties which may not easily and equitably be overcome. In the times in which the existing system arose, it would have been absurd to hope for reasonable co-operation towards such an object ; and

the law, being too weak and loose to enforce submission to arrangements for the general good, could only prohibit whatever would give a local or individual monopoly, and then abandon all to the barbarous and wasteful system of "catch who can." But circumstances have now changed, and the road to a rational method is open to us. The absolute and relative value of every salmon-fishing property being now pretty well ascertained, the proportion which the share of each proprietor bears to the whole of his river or district can be settled by arbitration and evidence, and that, of course, would be the proportion which he should draw from the one common or general fishery. In making such an arrangement, some men would doubtless think that they had been allotted less than their share; but even if any man were, according to his own estimate, made worse off proportionally, he would nevertheless be better off positively; he might be able to think himself not so much benefited as his neighbours, but he would not be able to deny that he too had benefited, and the public with him.

It is now more than a dozen years since this radical reform was propounded; and a similar suggestion (of which we were not then aware) was made privately, so long ago as 1839, by Mr. Thomson of Banchory, who proposed to his brother-proprietors on the Aberdeenshire Dee that they should form themselves into "one fishing company," and fish the river for the common benefit, as near the mouth as practicable, with as few engines as might be found sufficient. But up to this hour the plan has only been smiled at or sneered at as a chimera, although any specific or tangible objection

brought against it has proceeded upon a misunderstanding. Thus, it has been objected to as if necessarily meaning the erection of *one* engine capable of capturing or passing at will whatever might be thought the proper proportion of fish to capture or to pass—a proportion which could be measured either by time or number. In many rivers there are insuperable natural difficulties in the way of erecting such an engine, but the substance or principle of the proposal is simply, that no more machinery should be used than is *necessary*, or than would be used if one man owned the whole river ; and there is plenty of room between *one* engine, and one hundred doing the work which could be as well or better done by a dozen. Nothing has been said, or is likely to be said, in disproof of the truth, that one effect of such a reform would be a great saving of expense in wages and materials, which at present seem to amount, on the chief fisheries, to nearly three-fourths of the total value of the produce ; and that a still grander result would be, the putting an end to wasteful strife, opening up a free field for amicable co-operation, and making simple a hundred questions which are now complex, by transforming, at one stroke, the contending parties from competitors to partners. In a word, it would introduce into the piscatorial realms the three great, well-known, and much-coveted benefits of Peace, Reform, and Retrenchment.

THE END.

APPENDIX.

TABLE, showing the OPEN SEASONS for NET-FISHING and for
ROD-FISHING in the RIVERS OF SCOTLAND, so far as fixed at
May 1864.

	NET.	ROD.
Add,	Feb. 16 to Aug. 31.	Feb. 16 to Oct. 31.
Awe,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Beaul,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 15.
Berriedale,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Bervie,	Feb. 25 to Sept. 9.	Feb. 25 to Oct. 31.
Clyde and Leven,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Conan,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Dee (Aberdeen),	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Dee (Kirkcudbright),	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Deveron,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Doon,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Don,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Echaig,	Feb. 16 to Aug. 31.	Feb. 16 to Oct. 31.
Esk (North and South),	Feb. 16 to Aug. 31.	Feb. 16 to Oct. 31.
Findhorn,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 10.
Fleet,	Feb. 25 to Sept. 9.	Feb. 25 to Oct. 31.
Fors,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Forth,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 15.
Girvan,	Feb. 25 to Sept. 9.	Feb. 25 to Oct. 31.
Kyle of Sutherland (Carron, Cassely, Oikel, and Shin),	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 15.
Luce,	Feb. 25 to Sept. 9.	Feb. 25 to Oct. 31.
Nairn,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 15.
Ness,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 15.
Nith,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 31.
Spey,	Feb. 11 to Aug. 26.	Feb. 11 to Oct. 15.
Stinchar,	Feb. 25 to Sept. 9.	Feb. 25 to Oct. 31.
Tay,	Feb. 4 to Aug. 20.	Feb. 4 to Oct. 10.
Tweed (under Act 1859),	Feb. 15 to Sept. 14.	Feb. 1 to Nov. 30.
Ugie,	Feb. 25 to Sept. 9.	Feb. 25 to Oct. 31.
Urr,	Feb. 25 to Sept. 9.	Feb. 25 to Oct. 31.
Ythan,	Feb. 25 to Sept. 9.	Feb. 25 to Oct. 31.

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ERRATUM.

Page 48, line 2, for *Rae read* Ray.

