

In the report for 1887 of Mr. Fryer, one of Her Majesty's Inspectors of Fisheries in England, to whose able and very comprehensive and detailed reports I am so largely indebted in compiling these notes on pollutions as affecting fishery resources, it is stated that while the Tyne is the most productive of all the salmon rivers of England and Wales and one of the most extensively polluted by sewage, mining refuse and manufacturing waste, liquid and solid, yet its salmon harvest remains wonderfully good. Its productiveness was, however, stated to be on the decline; but whether due to pollutions or to overfishing could not be decided, though it was pointed out that the large body of sea-water pouring up the tideway no doubt did much to counteract the evil results that might otherwise accrue. Certainly the catches of salmon by net and by fly on the Tyne have during the last quarter of a century been wonderfully maintained, and the river has apparently been as well supplied with fish as the most optimistic could expect. Thus in 1886 and in 1887 the takes were 25,696 and 18,835 respectively. Five years later 1891 and 1892 they were 29,298 and 31,080 respectively, and at the end of another five years 1896 and 1897 they were 15,755 and 11,081 respectively. The last published figures 1898 are reported as showing an average catch, the quantity being 11,422. The Tay in spite of the fact that Dundee, Perth and other centres of population occur along its course is by no means denuded of its salmon, though the catches during recent years have been below the average. How far these decreased takes in the river are to be accounted for by the destructive netting and trapping along the estuaries and seashore it is not easy to decide. The Tay like all salmon rivers is subject to remarkable fluctuations and it is interesting to note, as indicating the continued productiveness of the Tay, that its annual rental (that is the amount received by the riparian proprietors for the netting and angling privileges), amounted in 1898 to over \$100,000; in the previous year to over \$85,000; and in 1894 to \$95,000.

What is the conclusion which the intelligent observer must reach, who glances over the series of facts and inferences briefly set forth in the foregoing pages. In the first place it is evident that circumstances modify the effects of all forms of pollution, so that waste matters which would be deadly in one river, will pass away and prove of little harm in another, where the conditions are different. In the second place it shows how varied are the effects of various waste products under the same conditions upon different species of fish. Salmon will survive unharmed where shad and gaspereaux would be killed off.

Further these notes indicate how little is actually known of the effects upon fish-life of these various pollutions from accurate and thoroughly scientific experiment. Common opinion and popular ideas more largely prevail than reliable and demonstrated knowledge. Nor must it be forgotten that, however pure and free from pollution rivers may be made by rigorous enforcement of laws against such offences, it is vain to expect a restoration of the fishery resources, and the repeopling of depopulated waters, if the parent-fish are shut off and obstructed by mill-dams, canal locks, timber refuse, log-jams, booms and fallen trees, or any obstacles by which they are prevented from reaching the spawning beds. If the spawning grounds be kept free from pollution and the deposition and fertilization of the eggs be accomplished; and if moreover free and unobstructed access to these grounds be provided for the fish, and, above all, if over-fishing, excessive netting and destruction of the ascending fish be prevented, there need be little fear that our supplies of salmon and valuable migratory species will wholly fail. The assistance of artificial fish-culture will be an effective adjunct.

There may be cases where the erection of mill-dams and pollution by poisonous waste products is of more moment than the destruction of the fisheries in a particular river. The utilitarian motive may be overwhelming, and valuable industries on a large scale may, in some cases, outweigh fishery interests and considerations. Of the serious results to a community from a too rigorous enforcement of fishery laws, a striking example has been recently afforded in King's County, Ireland. In a local journal it was stated that 'the fine mills of Springfield and Belmont, which are owned by Mr. Archibald Coulahan, are to be closed shortly. The owner is taking this course in consequence of the Fishery Conservators compelling him to