local board of conservators, and (2) that each board of conservators may make bye-laws for the regulation and improvement of the fisheries within its own district. The annual close time for salmon in England and Wales at present for nets commences Aug. 14-Scpt. 30 and closes Feb. 2-April 1, varying in different districts within the limits given ; for rods the close time is Sept. 30-Nov. 29 to Feb. 1-May 1. The law as regards close time for fixed engines was amended in 1879. The method of fishing followed in the English and Welsh estuaries is in consequence of the above course of legislation that of sweep-nets worked from shore by boats ; a licence duty has to be paid for each net, and stake-nets along the coast are very rare. An inspector of salmon fisheries appointed by the Home office reports annually.

In Scotland the salmon fishery customs in one respect differ much from those of England : stake nets are the common and universal means of salmon capture in estuaries, although sweep nets are also employed. The reason of this is that originally all the salmon fishings belong to the crown or the grantees of the crown. Tho principal Acts regulating Scottish salmon fisheries are those of 1862 and 1868, but, as the previous statutes have never been repealed, the law on the subject is somewhat confused. Scotland has been divided into fishery districts managed by district boards. An annual close time of 168 days is enforced, lasting for nets from August 26 to September 14 until February 5 to February 25, and for rods from September 14 to November 20 until January 11 to February 25. The weekly close time lasts thirty-six hours, from Saturday night till Monday morning. The construction of cruives, mill-lades, dams, and water wheels and the size of the meshes of nets are all regulated. In 1882 the management of the salmon fisheries was placed together with that of the sea fisheries under the control of the reconstituted Scottish Fishery Board, to which power was given to appoint an inspector of salmon fisheries; by this official an annual report of the condition of the fisheries is presented through the Fishery Board to the Home office.

The principal Act relating to Irish fisheries is that of 1863. Special Fishery Commissioners are responsible for the carrying out of the legal regulations. The country is divided like England and Scotland into fishery districts under the jurisdiction of hoards of conservators, by whom clerks and water bailiffs are appointed. A scale of licensing duties is enforced, and all new fixed engines—that is, any beyond those which legally existed in 1862—are illegal. The weekly close time in Ireland is of forty-eight hours’ duration, from 6 A.M. Saturday to 6 A.M. Monday. The annual close time is for nets from July 16 to September 30 until January 1 to June 1, and for rods from September 14 to November 1 until January 1 to June 1. In Ireland as in England and Scotland an inspectorship of salmon fisheries exists, and the holder of the office makes an annual report to the Home office on the condition of the fisheries.

*Introduction of Species to New Areas by Human Agency.*

Within the past few years, since great activity has been exhibited in pisciculture generally, and especially in the culture of *Salmonidæ,* various experiments have been made in the trans­portation of eggs or young fry of valuable species from their native habitats to distant parts of the world. The American so- called brook trout, *S. fontinalis,* has been imported somewhat largely into Britain by various salmon fishery proprietors. It thrives well in various places in England, Scotland, and Wales where it has been set free,—for example, in Norfolk rivers, near Guildford in Surrey, and in the stock ponds at Howietoun.

In *Nature,* July 16, 1885, an account was given of the introduc­tion of the fry of tho American landlocked salmon (*S*. *salar,* var. *sebago)* to the upper waters of the Thames. Eggs of *S*. *namaycush, S. sebago, S. fontinalis,* and *Coregonus albus* have been successfully forwarded from the hatcheries of the American Fish Commission to the Deutsche Fischerei-Verein in Berlin, and to the Société d’Acclimatation at Paris.

The common trout of Britain, *S. fario,* was introduced with complete success into Tasmania nearly twenty years ago by Frank Buckland, and is now abundant in the Tasmanian streams, although it is reported to be much less valued as food there than at home. From Tasmania the eggs were transported to the rivers in otago, New Zealand, where they also thrive and breed (see *Trans.* of otago Institute, 1878). In 1866 Mr Francis Day introduced the fry of the same species into the rivers of the table-land of the Nilgiris in the neighbourhood of Madras. The experiment on this occasion failed, but two years later the establishment of the species in the district in question was successfully accomplished by Mr M'Ívor, who imported the fry from Scotland.

*Salmon Culture.*

For the artificial culture of Salmonoids the reader is referred to the article Pisciculture. The following account of the salmon and trout hatcheries in Scotland is abridged from a paper read before the Scottish Fisheries Improvement Association in Edin­burgh, 26th November 1884, by J. Barker Duncan, the honorary secretary to the Association.

The principal institution of its kind in Scotland at present is the Howietoun Fishery, belonging to Sir J. Gibson Maitland, who commenced it in 1873. Howietoun is about four miles from Stirling. The establishment contains thirty-two fish ponds and a large hatching-house; there are also four ponds at Craigend, and one of 9 acres at Goldenhove, where fish are reared to their adult condition. The hatching-boxes are of wood, and the eggs are kept during development on glass grilles. The water supply is abundant, about a million gallons of spring water flowing through the ponds every twenty-four hours. The eggs batched in greatest numbers are those of the Loch Leven trout, but *Salmo solar* and the common trout *(Salmo fario)* are also extensively reared. The American brook trout, *S. fontinalis.* is also cultivated. More than ten millions of ova are annually treated at this hatchery. In 1884 ninety thousand young fish were distributed to various parts of Great Britain and Ireland, and two consignments of trout and one of salmon ova were successfully sent to New Zealand.

The Solway Fishery, belonging to Mr Joseph J. Armistead, was established in 1881, to supersede the Trentdale Fishery near Keswick, Cumberland. It is situ­ated near the Solway in Kirkcudbrightshire. Various kinds of trout and charr, salmon and sea-trout, grayling, and other freshwater fish are bred. The hatching- house is fitted to hatch about a million ova. Small and large quantities of ova are supplied to applicants for purposes of stocking or for experiments in fish culture.

The Stormont field Ponds were established in 1853 by proprietors of Tay fisheries. They are situated about 5 miles above Perth on the Tay and occupy about 2 acres of ground. The Stormontfield experiments above referred to were carried out nt these ponds under the direction of Mr Robert Buist. The establishment is now almost superseded by the Dupplin Hatchery, but is still used to some extent The hatching-boxes, 860 in number, are in the open air, and the eggs are placed on gravel at the bottom of the boxes ; a larger percentage of loss occurs with this system than when glass grilles are used. Two of the ponds at Stormontfield are stocked with parr from, the Dupplin Hatchery, about 20,000 being placed in them in 1884 ; the parr are fed with ground liver, and are liber­ated in the river and its tributaries when two years old.

The Dupplin Hatchery was instituted in 1882 by the Tay district board at Newmill, Dupplin Castle, on the river Earn, a tributary of the Tay. Tho hatching-house is supplied with spring water, and contains about 300,000 ova. The glass grille system is adopted here, and the fry are liberated in the Tay and its tributaries when about forty days old.

There is a hatchery for Loch Leven trout erected in 1883 by the Loch Leven Angling Association, situated about 800 yards from the loch, beside a small stream. In the season of 1884-85 about 220,000 eggs were laid down. The fry are turned into the feeders of the loch five or six weeks after hatching. Before the erection of this hatchery Loch Leven was several times stocked with fry from the Howietoun Fishery. The great effect of stocking on the produce of Loch Leven is shown by the following figures:—in 1884 over 15,000 trout were taken in the loch during the season from April to September; during the preceding ten years the lake had been supplied with some thousands of fry in five several seasons; previous to 1874 no attempt at stocking had been made, and in that year the total catch was about 5000.

In May 1884 the Linlithgow Palace Loch Hatchery was opened by its proprietor, Mr A. G. Anderson, fish merchant, Edinburgh, who holds a lease of the loch for angling purposes from the crown. The hatchery is intended chiefly to stock the loch, and is capable of containing about 600,000 ova. Experiments on the cultiva­tion of *Salmo salar,* var. *sebago,* from America, arc also to be made here.

A private hatchery belonging to the marquis of Ailsa, capable of hatching about 250,000 ova, is situated at Culzean in Ayrshire. Salmon ova are obtained from the rivers Doon, Stinchar, and Minnock, and the fry turned again into those rivers when about six weeks old. Chair, *S. fontinalis,* and Loch Leven trout are also hatched to stock the hill lochs of the estate of Culzean. Accord­ing to Mr Young the number of salmon in the Doon has been considerably increased by the artificial stocking from this establishment.

Another private hatchery, with a capacity of 50,000, is maintained on the Lochbuy estate, Isle of Mull, for the purpose of stocking the rivers and lakes on the property.

The Aberdeen Hatchery was established in Aberdeen by the district boards of the rivers Dee and Don. From 15,000 to 20,000 fry arc hatched here every year and arc conveyed 10 to 40 miles up the rivers Dee and Don and then liberated.

Various proprietors in Scotland have at various times erected small hatching- houses on the rivers of their estates for the purpose of stocking, but these have not been maintained. The above-mentioned are the only salmon-rearing establishments of any importance at present in operation in Scotland.

*Salmon Disease.*

During the last few years salmon in a great many rivers have been observed to be suffering from an epidemic cutaneous disease from which large numbers have died. So far as is known this disease in its epidemic form is quite a new phenomenon ; there can be little doubt that it must have occurred as a sporadic affection in former times, but it seems on the other hand probable that such mortality among salmon as has taken place in some recent seasons must have attracted attention if it occurred, even when accurate observation was rare. The disease was first noticed in 1877 in the Esk and the Nith, flowing into the Solway Firth, and since then it has destroyed very large numbers of salmon in almost every river in Britain. The disease consists in ulcerations of the skin, which begin at one or several spots on the head and body, and ultimately extend to the whole surface of the fish. The diseased parts of the skin are found when examined to be covered with a fungoid growth, with the mycelium of a fungus consisting of plaited hyphae which extend into and ramify through the tissue of the derma and epidermis, causing the cells to die, until the super­ficial tissues decay and slough off, and inflammation and bleeding are produced in the deeper and surrounding parts. It is certain that the injury to the skin and flesh of the salmon is caused by the fungus. If a section of the edge of an affected spot be made, and examined microscopically, the cells are seen to be perfectly normal and healthy beyond the region to which the hyphae extend, and the growing points of the hyphae are seen to be penetrating between and distorting these uninjured cells. It is evident therefore that the morbid alteration of the tissues follows the attack of the hyphae and does not precede it. Tho external superficial part of the mycelium covering a diseased spot of the skin bears the fructification of the fungus. This consists of zoosporangia, which are the enlarged blind terminal parts of certain of the hyphae,