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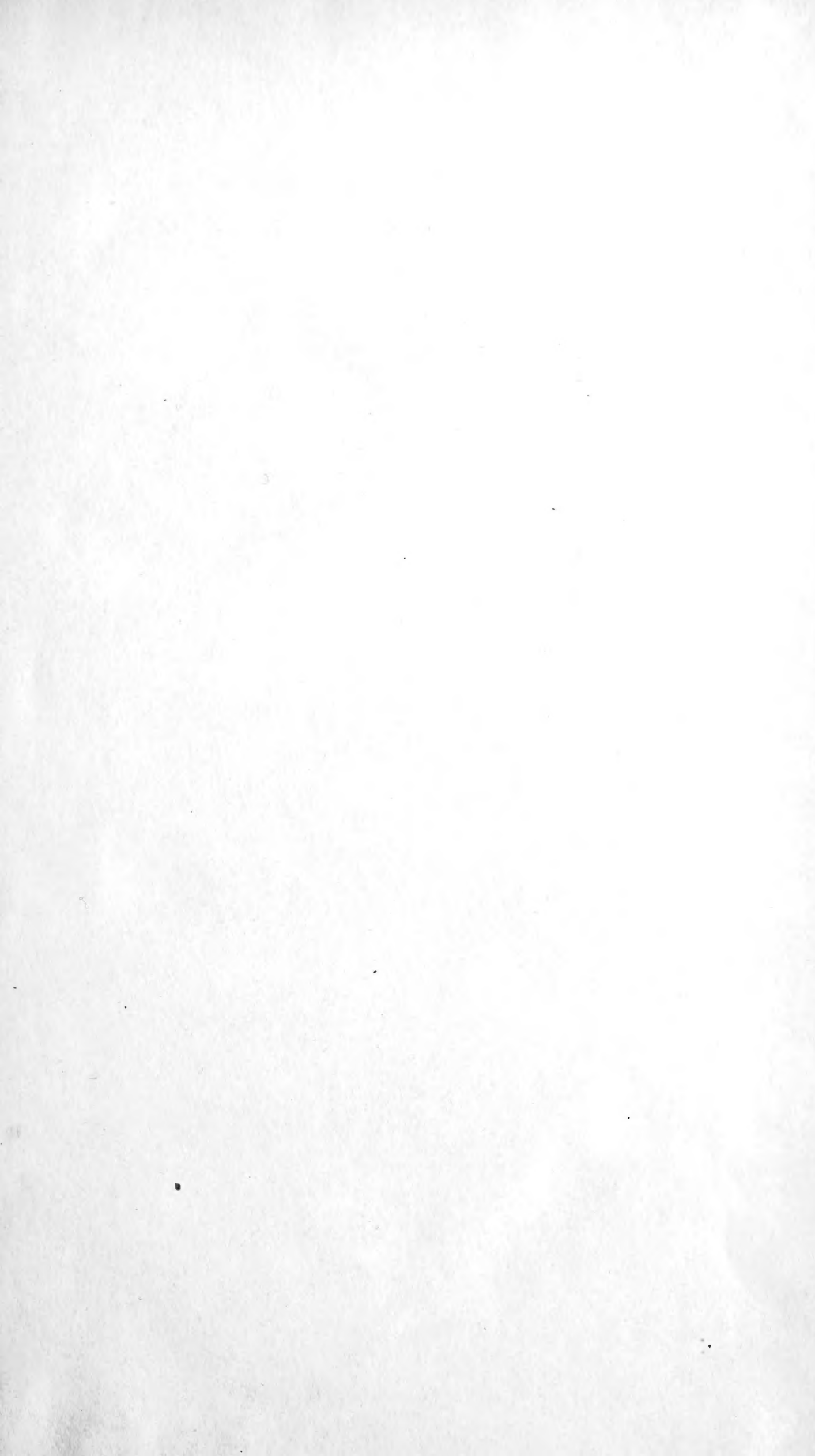


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JUL 31 1918

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# THIRTY-SIXTH

# ANNUAL REPORT

OF THE

# FISHERY BOARD FOR SCOTLAND

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Being for the Year 1917.

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Presented to Parliament by Command of His Majesty.

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**Ordnance Survey and Geological Survey Publications** can be purchased from The Director-General of the Ordnance Survey, Southampton; from The Director of Ordnance Survey, Dublin; or from Agents in most of the chief towns of the United Kingdom. They can also be ordered through any Bookseller. Small Sea Maps are on sale at all Railway Bookstalls.

The **Journal of the Board of Agriculture and Fisheries** is published monthly by the Board, and is obtainable from 3, St. James's Square, London, S.W. Price 4*d.*, post free.

The following is a list of some Parliamentary and Official Publications:—

## FISHERY BOARD FOR SCOTLAND.

35TH ANNUAL REPORT, FOR 1916.

Part I.—General Statement; Means of Capture; Herring Fishery; Scottish Fishermen at English and Irish Fishings; Herring Curing; Cured Herring Exported; White Fish Fishing; Curing of White Fish; Persons engaged in Scottish Fisheries; Improvement of Fishery Harbours; War Work of the Board; Members of the Staff serving with the Forces. *With Chart.*

Part II.—Salmon Fisheries. *With Chart.*

Part III.—Scientific Investigations.

Appendices:—Means of Capture; Total Quantity of Fish Landed; Fish Used in a Fresh State; Fish Cured; Cured Fish Exported; Persons Employed in Piers and Harbours; Harbour Improvement Schemes; Salmon Inspector's Report; Annual Close Times applicable to the Salmon Rivers in Scotland; List of Chairmen and Clerks of Salmon Fishery District Boards in Scotland.

[Cd. 8625] of Session 1917-18. Price 9*d.*, post free 11½*d.*

BYELAWS, CLOSE SEASON ORDERS, &c.,

affecting the Sea and Salmon Fisheries of Scotland, in force on Sept. 30, 1913. (1913.) Price 9*d.*, post free 10½*d.*

### SALMON FISHERIES, 1910.

I. Infrequency of Spawning in the Salmon, as shown by the Study of the Scales of Fish caught in Fresh Water; II. Results of Salmon Marking—seventh paper; III. A Study of Fish received as "Mended Male Kelts." (1911.) Price 6*d.*, post free 7½*d.*

### SALMON FISHERIES, 1911.

I. Infrequency of Spawning in the Salmon. (1912.) Price 3*d.*, post free 4*d.*  
II. Results of Salmon Marking—eighth paper. (1912.) Price 2*d.*, post free 3*d.*

### SALMON FISHERIES, 1912.

I. Scales of Salmon of the River Add. *With 3 Plates.* (1913.) Price 4*d.*, post free 5*d.*

### SALMON FISHERIES, 1913.

I. Salmon Research in 1913; Sea Netting Results. *With Chart.*  
II. Results of Salmon Marking in Rivers—ninth paper.  
III. The Spawning Mark on Salmon Scales: A Review. *With Plate.* (1914.) Price 9*d.*, post free 10½*d.*

### SALMON FISHERIES, 1914.

I. Hatchery Results at Glen Etive; II. Further Notes on the percentage of previously-spawned Salmon. *With Plates.* (1914.) Price 9*d.*, post free 10½*d.*  
III. Salmon Research in 1914; Sea Netting Results—second paper. *With 2 Charts;* IV. Study of the Salmon of the Moray Firth. (1915.) Price 2*d.*, post free 1*s.* 2*d.*

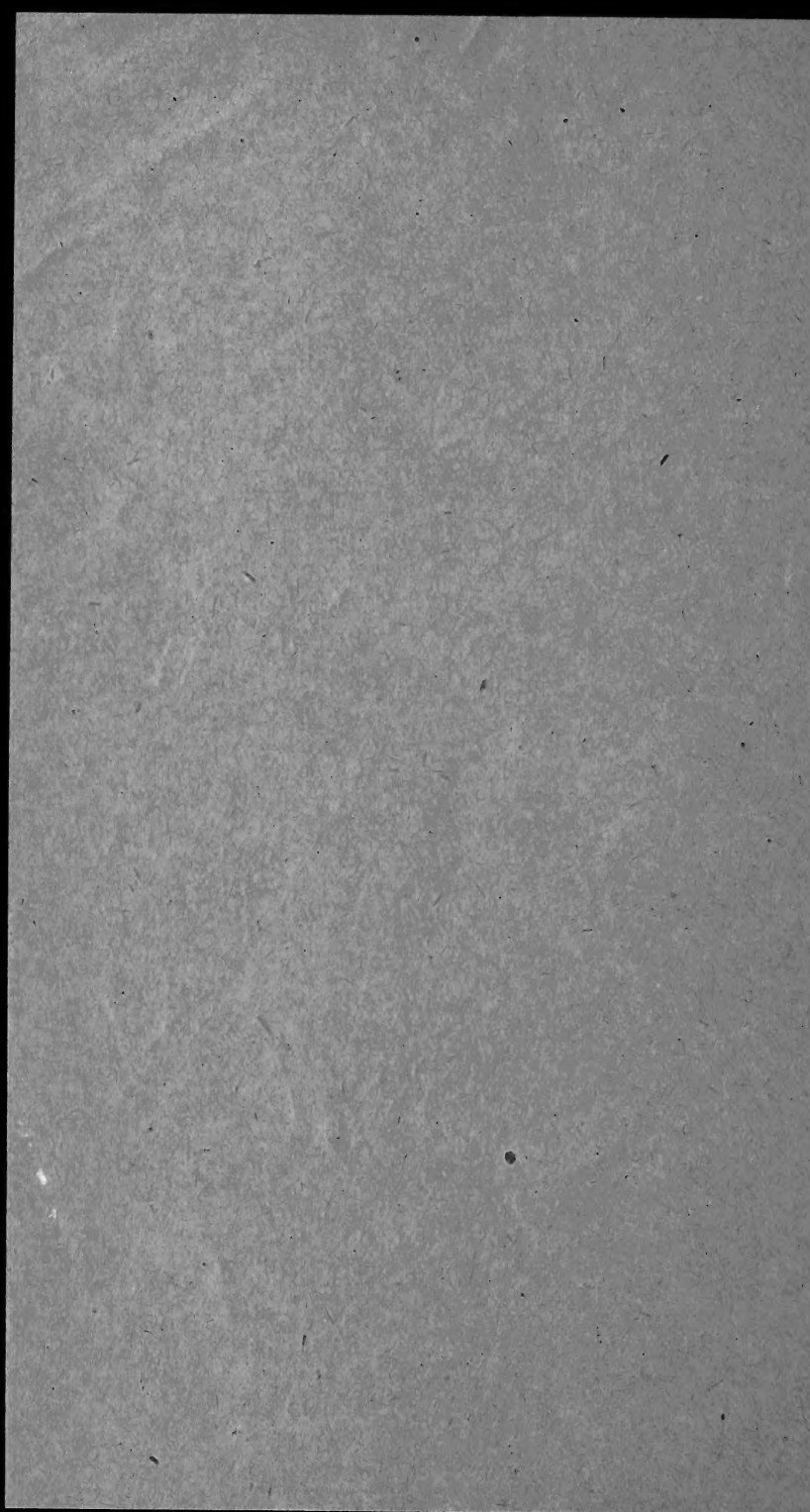
WITH THE SECRETARY'S COMPLIMENTS.

FISHERY BOARD FOR SCOTLAND,

EDINBURGH,

*11 July*

1918.





THIRTY-SIXTH  
ANNUAL REPORT

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## CHANGES IN MEANS OF CAPTURE.

The figures for the year 1917 as to the number and value of the boats, etc., engaged in the Scottish fisheries during the year, given above and in Appendix A, do not include the vessels engaged in the service of the country, or unemployed on account of the Admiralty restrictions of the fishing area or the lack of crews to man them.

In regard to the steam fishing fleet there is little to record. A number of steam trawlers were built, but they were very little engaged in fishing, being taken over for national work as soon as possible, while the building of steam drifters practically ceased.

The installation of motor engines into sailing boats has, however, been proceeding apace with undoubted advantage to all concerned. The number of boats actually employed at the fishing is shown in Appendix A, but if boats engaged otherwise than at fishing or unemployed during the year are taken into account, the Scottish motor fishing fleet at the end of 1917 numbered 1262, an increase of 278 over the total for the previous year. As in 1916 the outstanding feature of the year in this connection was the increase in the number of boats of the largest size propelled by motor engines. Substantial as is the increase reported, it would undoubtedly have been much greater but for the difficulties experienced by the makers in supplying and installing engines, a large number of orders given during the year being still unfulfilled.

The following figures indicate the totals for the years 1916 and 1917:—

	Year 1916.	Year 1917.	Increase.
East Coast . . . . .	594	811	217
Orkney and Shetland . . . . .	45	54	9
West Coast . . . . .	345	397	52
Totals . . . . .	984	1262	278

The increase in 1917 occurred principally in the following districts:—Anstruther 23, Aberdeen 20, Peterhead 22, Fraserburgh 35, Banff 24, Buckie 26.

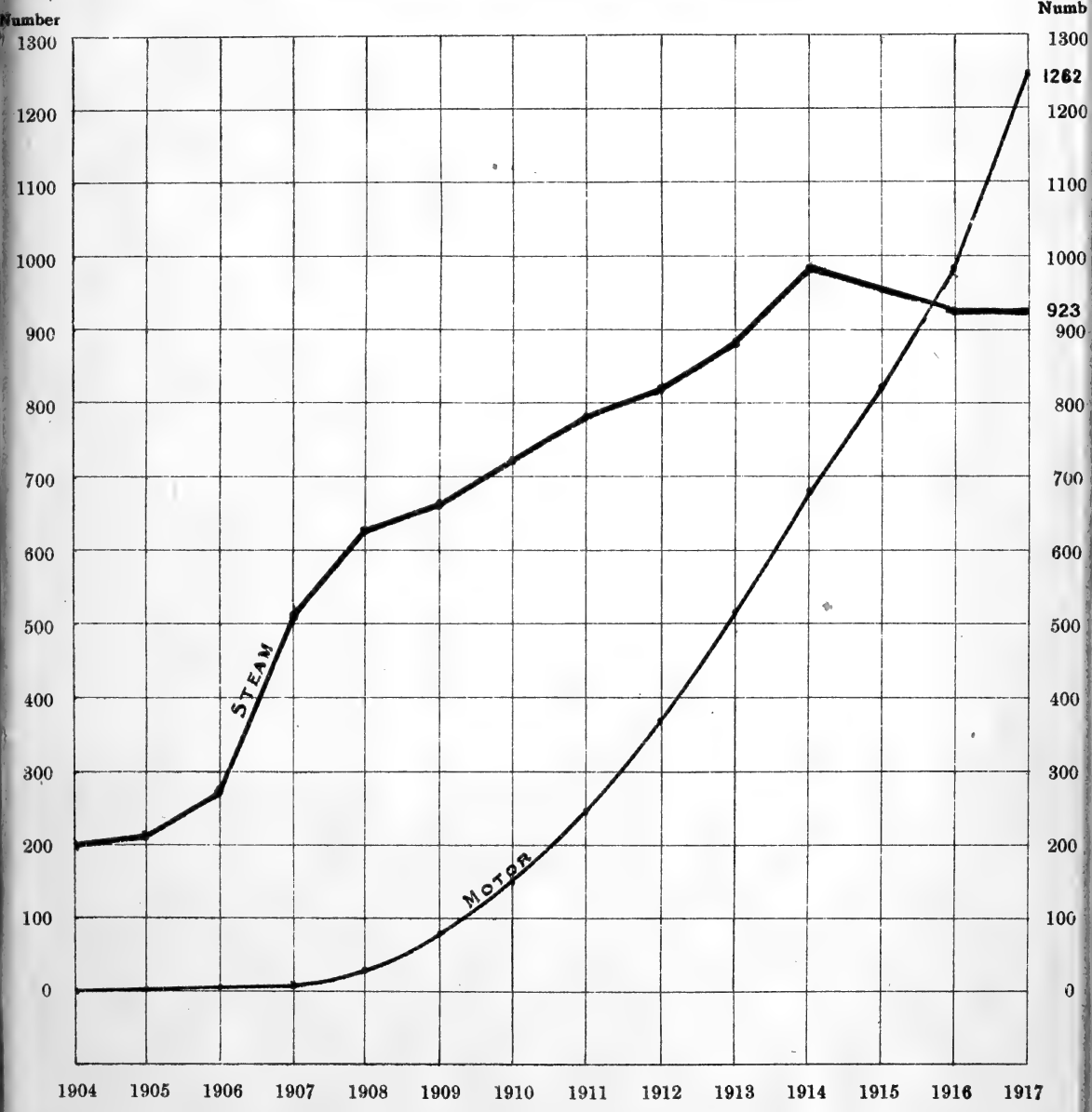
On the opposite page we give a diagram showing in graphic form the increase in the steam and motor fishing fleets of Scotland during the last thirteen years: the figures for 1915, 1916, and 1917 represent the numbers of vessels on the register, not the numbers actually engaged in fishing, during the respective years.

## DIFFERENT FISHERIES.

1. *HERRING FISHERY.*

The quantity of herrings landed in Scotland during the year 1917 was 1,972,346 cwts., valued at £1,563,824; compared with 1916 there was a decrease of 5 per cent. in quantity, but an increase of 16 per cent. in value.

# CHART SHOWING THE INCREASE OF STEAM DRIFTERS AND LINERS AND MOTOR BOATS.







The following table shows the results of the Scottish herring fishery since 1908:—

Year.	Quantity. Cwts.	Value. £	Average Price per Cwt.
1908 . . . . .	5,690,114	1,151,644	4/0½
1909 . . . . .	4,541,297	1,569,743	6/11
1910 . . . . .	5,687,226	1,594,308	5/7
1911 . . . . .	5,036,484	1,505,334	6/
1912 . . . . .	5,201,300	1,910,533	7/4½
1913 . . . . .	4,449,323	2,087,754	9/4½
1914 . . . . .	4,383,265	1,339,046	6/1¼
1915 . . . . .	703,096	441,980	12/6¾
1916 . . . . .	2,086,177	1,350,609	12/11½
1917 . . . . .	1,972,346	1,563,824	15/10¼

The most outstanding fishing of the year, though not the most productive, was that prosecuted on the West Coast during the spring months. This fishing yielded, from January to March, a total of 712,371 cwts., as compared with 314,206 cwts. in the corresponding period of 1916.

Stornoway was, as usual, the principal centre of the fishing, but owing to the demand for herrings in the home markets, and the greater freedom of movement permitted by the revised Admiralty Orders which came into force prior to the opening of the fishing, heavy landings were made at the railway termini on the mainland. The landings at Mallaig, Kyle, and Oban represented about 40 per cent. of the season's catch, whereas in 1916, when the catch was much smaller, only 17 per cent. was landed at those ports.

This tendency continued throughout the year, the total figures for which show that 435,000 cwts. were landed at Stornoway, and 482,000 cwts. at the mainland ports. The change which the war conditions and national food requirements have brought about is indicated by a comparison between these figures and those for the last normal year, 1913, when 524,000 cwts. were delivered at Stornoway as against 160,000 landed at the other ports.

The Shetland herring fishing was not prosecuted with any vigour during the year. The landings in the first quarter of the year were greater than in the same period of 1916, but the summer fishing was limited to local boats, and this fact, and the lack of adequate transport facilities to enable the catch to be placed on the home markets were responsible for the great diminution in the catch, the year's total being only 120,000 cwts. as against 470,000 cwts. in 1916.

The summer herring fishing on the East Coast yielded a total of 685,776 cwts., as compared with 727,717 cwts. in 1916. The fishing opened in May, but it was not until June that satisfactory results were secured. The restrictions which the Naval Authorities found it necessary to impose limited the operations of the fishermen.

On the North-East Coast fishing was conducted mainly from Fraserburgh and Peterhead; the landings at Aberdeen were negligible, but Macduff and Buckie received increased quantities. Fishing was not prosecuted from Wick or the Orkney ports, the grounds in the vicinity being closed.

On the South-East Coast fishing was prosecuted from Eyemouth with somewhat greater success than in 1916.

It is interesting to note that motor drifters landed a greater proportion of the year's catch than steam drifters: this, however, was wholly due to the small number of the latter class remaining at the fishing.

#### DISPOSAL OF HERRING CATCH.

For the best part of a century the principal markets for the produce of the Scottish herring fishery have been in foreign countries, and so effectually did the arrangements for the supervision of the cure and export of pickled herrings and the enterprise and efficiency of the trade adapt themselves to the conditions and requirements of the markets on the Continent, that Scottish cured herrings acquired a decided supremacy therein. This was the position at the outbreak of the war, but the closing of the German market, the difficulties of business in, or export to other areas, and the necessity for conserving home supplies of food have effected a material alteration of the position.

Towards the close of 1916 the authorities decided to prohibit the export of fish to all destinations, and as it was intimated that the issue of export licences for herrings would be limited, it was necessary for the Board to consider how the situation so created could best be met, and it appeared to them to be necessary in the first place to direct their energies towards restricting pickling, and, on the other hand, ensuring that the greatest possible proportion of the catch was placed on the home markets either in a fresh state, smoked as kippers—to secure them against the vicissitudes of transport and other delays—or tinned.

The distance from the landing ports to the centres of population, transport difficulties due to shortage of stock and men and, on the West Coast, the sea passage and the long stretches of single railway line, presented serious difficulties to the realisation of the end in view, but a much greater proportion of the catch was placed on the market in the manner most suitable to the taste of the consumer than in 1916.

The following table shows the disposal of the catch in 1917 as compared with the previous year:—

	Freshed.	Kippered.	Bloaters or Reds.	Tinned.	Cured Gutted.	Cured Un- gutted.
	Cwts.	Cwts.	Cwts.	Cwts.	Barrels.	Barrels.
1917	666,889	654,598	46,133	59,678	193,081	25,360
1916	442,292	547,795	22,459	79,212	343,582	30,612

This statement shows that with a similar total catch the quantity freshed and kippered increased 33 per cent., and the quantity cured gutted decreased 43 per cent. as compared with 1916.

The scarcity of other food supplies would in any event have given rise to an increased demand for herrings, but bearing in mind the tradition of the trade—which looked abroad for its markets—and the difficulties alluded to above, the Board feel that the result is eminently satisfactory, more especially as it was achieved without any special organisation or special staff, and they desire to place on record their appreciation of the manner in which the trade as a

whole directed their energies into new channels, and of the efforts made by the officials of the various railway companies to overcome the transport difficulties.

### HERRING CURING.

The quantity cured gutted during the course of the year may be regarded as the surplus remaining after meeting the effective demand for fresh and kippered herrings. By the close of the Stornoway winter fishing a large stock had accumulated, and, as licences to export were not being granted, there appeared a possibility that curers might not carry on their operations during the summer. As any cessation of such operations would have had a serious effect on the fishing as a whole, the Cured Fish Committee, appointed by the Food Controller in May to acquire, control and distribute stocks of cured fish, and of which the Board's Secretary was a member, formulated a scheme for the export of half of the winter cure and for the taking over by the Government, at certain specified prices, of the balance of the winter cure and of the whole summer cure. The scheme was accepted by the trade, and resulted in a substantial reserve of cured herrings being formed.

The total export during the year was 77,648 barrels, of which 52,041 were despatched to Russia *via* Archangel, and 16,109 to the United States of America.

The exports to the principal markets abroad since 1908 have been as follows:—

Year.	To Germany.*	To Russia.	To America.
	Barrels.	Barrels.	Barrels.
1908 . . . . .	1,001,645	616,497	74,175
1909 . . . . .	786,682	574,307	69,074
1910 . . . . .	982,361	732,345	73,409
1911 . . . . .	794,219	655,814	75,005
1912 . . . . .	719,013	750,187	93,471
1913 . . . . .	672,701	619,680	104,045
1914 . . . . .	353,323	493,039	115,347
1915 . . . . .	—	51,143	45,385
1916 . . . . .	—	285,365	46,281
1917 . . . . .	—	52,041	16,109

\* From 40 to 50 per cent. of the total quantity of herrings exported to Germany was, in normal circumstances, sent over the frontier to Russia and other Eastern countries.

Pickled herrings have not in recent years been a common article of diet with the population of the United Kingdom, but the general food situation and the propaganda carried on by the Government Departments concerned, trade associations and private traders appear to have resulted in a substantial increase in the home consumption of this wholesome and nutritious article of food. Including the quantity on hand at the beginning of the year, the total stock of Scottish cured herrings in 1917 was 228,073 barrels; of this 77,648 barrels were exported, and 84,663 barrels remained in stock at the curing ports at 31st December last, and the balance had been distributed for consumption in the home markets. Part of this home consumption represented supplies to prisoners of war, but

undoubtedly the ordinary civilian consumption was much greater than in normal years.

#### SCOTTISH BOATS IN ENGLAND AND IRELAND.

As mentioned in our Report for 1916, no Scottish vessels were allowed to participate in the East Anglian autumn fishing in that year, but in 1917 the Naval Authorities found it possible to grant greater facilities for the fishing, and a substantial fleet proceeded from Scottish ports, with satisfactory results. From a variety of causes, the chief of which was the heavy loss of gear, the Scottish fleet began to return home at the end of October—before the close of the fishing. As a premature termination of operations was undesirable in the interests of the food supply, the Secretary to the Board proceeded, at your request, to Yarmouth, and as the result of the appeal made by him, supported by prominent members of the trade, the skippers still at the port agreed to continue fishing as long as possible.

Scottish boats fished also from other English centres, and, to a limited extent, from certain Irish and Manx ports.

#### 2. WHITE FISH FISHING.

The quantity of white fish landed in 1917 showed a further decline, chiefly owing to the continued depletion of the trawling fleet. The value, on the other hand, reached a record figure, prices being high, with an upward tendency, throughout the year.

The following are the totals of the white-fishing since 1908 :—

Year.	Quantity. Cwts.	Value. £
1908 . . . . .	2,917,295	1,351,108
1909 . . . . .	2,830,728	1,305,811
1910 . . . . .	2,968,598	1,491,339
1911 . . . . .	3,391,316	1,540,539
1912 . . . . .	3,331,799	1,666,380
1913 . . . . .	3,296,257	1,824,741
1914 . . . . .	2,949,008	1,778,973
1915 . . . . .	1,540,345	1,585,717
1916 . . . . .	1,258,390	1,772,561
1917 . . . . .	1,007,569	2,021,817

Trawling has contributed to the foregoing result as follows :—

Year.	Quantity. Cwts.	Value. £
1908 . . . . .	2,092,411	971,972
1909 . . . . .	2,020,209	953,259
1910 . . . . .	2,102,031	1,102,976
1911 . . . . .	2,439,108	1,113,820
1912 . . . . .	2,392,692	1,232,193
1913 . . . . .	2,541,948	1,424,115
1914 . . . . .	2,191,387	1,333,834
1915 . . . . .	953,503	1,040,726
1916 . . . . .	735,862	1,117,056
1917 . . . . .	528,276	1,152,742

The balance, as follows, has been taken by lines and by nets other than trawls:—

Year.	Quantity. Cwts.	Value. £
1908 . . . . .	824,684	379,079
1909 . . . . .	810,519	352,552
1910 . . . . .	866,567	388,363
1911 . . . . .	952,208	426,719
1912 . . . . .	939,107	434,187
1913 . . . . .	754,309	400,626
1914 . . . . .	757,621	445,139
1915 . . . . .	586,842	544,991
1916 . . . . .	522,528	655,505
1917 . . . . .	479,293	869,075

Trawl voyages to the distant northern grounds were the most productive, yielding heavy and valuable shots, principally of codling and large haddocks. The Iceland and Faroe grounds were, however, not visited after July, mainly on account of the unsuitability of the remaining vessels for the voyages to these grounds, and the landings suffered accordingly. The North Sea grounds constantly fished were occasionally reported to be unproductive, but vessels worked steadily throughout the year and appeared, on the whole, to enjoy a profitable season.

Steam line fishing was little prosecuted, the total landed being only 34,884 cwts. as against 93,463 cwts. in 1916. Most of the fish accounted for under this head of the returns was landed on the West Coast by vessels principally engaged in drift net fishing.

Small line fishing again showed an increased yield, and for the first time the landings by motor boats exceeded those by sail boats.

A number of motor boats engaged in trawling off the East Coast at different periods of the year, the catches landed consisting chiefly of plaice. Exhaustion of the grounds fished and prosecutions for contraventions of the statute prohibiting trawling in inshore waters curtailed operations however.

#### WHITE FISH CURING.

The curing of white fish continued largely centralised at Aberdeen, and the extent of operations was further restricted. The prices ruling for fresh fish were too high to permit of their purchase for drying purposes, but haddocks received from other centres, such as Scalloway, were smoked for the home markets, and small quantities of consigned saithe and other kinds were secured for drying. The greater part of the fish dried in Scotland during the year, however, was imported wet salted, principally from Iceland and Faroe.

#### PERSONS EMPLOYED.

The number of persons employed in the fisheries of Scotland and the various industries subsidiary thereto in the year 1917 was 35,746. Of these, 14,800 manned the fishing fleet, 5245 were gutters and packers of herrings, 2057 were engaged in the carrying trade, and the remainder were engaged in other operations connected with the fishing industry.

## WHALING.

The whaling stations in Shetland and Harris were idle during the year, as operations in Scottish waters are still prohibited by the Naval Authorities.

## IMPROVEMENTS OF FISHERY HARBOURS.

Work on improvement schemes for fishery harbours on the East Coast was further slowed down during the year as a result of the war, and completion of a number of the schemes has been postponed until normal conditions return. A report for the year by the Board's Consulting Engineer is printed as Appendix M, p. 87.

## COMMITTEES DEALING WITH FISHERY MATTERS.

During the year three Committees dealing with matters affecting the fisheries of Scotland were appointed.

As previously stated, the Food Controller appointed the Cured Fish Committee to acquire, control and distribute stocks of cured fish. This Committee, of which the Board's Secretary was a member, resigned on the appointment by the Food Controller of a Director of Fish Supplies.

In April you appointed a Committee, on which the Board were represented by Provost Malcolm Smith and their Secretary, to consider the means by which, under existing conditions, the greatest quantity of food could be made available from the Scottish sea fisheries, and also a Committee to consider as to what extent and in what manner an additional supply of fresh-water fish from rivers and lochs could, under existing conditions, be made available for home consumption. Of the latter Committee the Marquess of Breadalbane, K.G., was Chairman, and the Inspector of Salmon Fisheries, Mr. W. L. Calderwood, was a member. Reports by both Committees were issued during the year.

## BYELAWS AND REGULATIONS.

No important change in the regulations affecting the Scottish fisheries was made during the year.

In June Byelaw No. 31 was made by the Board to consolidate and extend previous byelaws permitting seine flounder net fishing in the Firth of Clyde and in certain areas in the Firth of Forth and off the East Coast.

In October the Food Controller made an order under the Defence of the Realm Regulations—the Sea Fishing (Scotland) Order, 1917—conferring on the Board certain powers of modifying the normal restrictions on fishing.

## APPENDICES.

For the reasons explained in last Report the Appendices published are again much curtailed.

### WAR WORK OF BOARD.

During the year under review the duties devolving on the Board in connection with the war, which were already heavy, still further increased. It is not possible to indicate these in detail, but some of the war functions have been mentioned above, and general reference may also be made to (1) the Admiralty Orders regulating fishing operations; (2) the scheme under which the Board are consulted regarding the calling up for Naval service of fishermen enrolled in Section Y of the Royal Naval Volunteer Reserve in order to ensure that the requirements of the Admiralty are met with the least detriment to the fisheries; (3) the release from the Army and Navy of shore-workers required in connection with the industry, and the continuance of exemption for men essential in the interests of the national food supply; (4) the obtaining of priority certificates for supplying motor engines for fishing vessels; and (5) the great difficulties in obtaining supplies of various materials required in connection with the industry and the increasing extent to which such materials are controlled by different Government Departments.

Another important subject which has received, and continues to receive, the Board's most careful consideration is the re-establishment of the industry after the war.

All of this work has thrown a heavy burden on the Board's greatly reduced permanent staff, and on those temporarily engaged. We desire to put on record the loyal, efficient, and ungrudging way in which the work has been performed.

### MEMBERS OF STAFF SERVING WITH THE FORCES.

In addition to the staff of the Board's cruisers and research vessel, numbering 107, all of whom are now in Admiralty service, 21 members of the clerical, outdoor and scientific staff have enlisted in the Army or Navy, out of a total male staff of 62, one member of the clerical staff has been lent to the Munitions Department, and one of the outdoor staff to the Ministry of Food.

We regret to announce that Lance-Corpl. George W. Craig, Gordon Highlanders, formerly Assistant Fishery Officer at Wick, who, as stated in our last Report, was reported missing in July 1916, has since been posted as killed, and that Sergeant John Mowat, Gordon Highlanders, Fishery Officer of Helmsdale District, was killed in action on 23rd April 1917. Both were most promising officers, and their loss is deplored.

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## PART II.

### SALMON FISHERIES.

The total weight of salmon and sea trout carried by rail and steamship in Scotland in 1917 was 1731 tons, 11 cwts. This is greater, by 458 tons, than the weight carried in the previous year, but falls below the last quinquennial average by 325 tons. It may be recollected that the figure given in last year's report was the lowest ever reached in the history of Scottish Salmon Fisheries. A rise of 458 tons on the 1916 figure does not therefore represent a condition



of things in which any very great satisfaction can be felt. As compared with the last quinquennial average, the figures for the three last years are, indeed, rather depressing. The average referred to was 2056 tons.

The declines for the three last years from the last average are:—

In 1915, a decline of 348 tons.
„ 1916, „ „ 783 „
„ 1917, „ „ 325 „

The chart of curves shows the condition from year to year, and the downward movement may be said to be slowly progressing with an occasional break upwards.

The coast line has been divided into four sections as formerly and from the figures it appears that the conditions found in 1917 were very generally distributed in each district. The summer was extraordinarily dry in very many parts of the Highlands, and fish were unable to ascend the rivers for a considerable period. The coast nets, no doubt, reaped a certain advantage on this account. But the West Coast totals have sunk now-a-days to an unfortunately low level, the catch from the Clyde to the Solway being only 97 tons.

We give a table which shows four quinquennial averages since the year 1894, and the four last individual years.

District.	Average, 1894 to 1898.				Average, 1899 to 1903.				Average, 1904 to 1908.				Average, 1909 to 1913.			
	Tons.	Cwts.	Qrs.	Lbs.	Tons.	Cwts.	Qrs.	Lbs.	Tons.	Cwts.	Qrs.	Lbs.	Tons.	Cwts.	Qrs.	Lbs.
a Berwick to Cairnbulg Point,	1,206	18	1	1	839	1	2	9	887	8	2	24	1,015	5	3	18
b Cairnbulg Point to Cape Wrath,	900	17	3	6	737	10	3	17	608	13	1	19	664	14	-	3
c Cape Wrath to Glasgow, . . . .	403	7	1	21	274	18	1	27	209	3	3	6	205	2	-	7
d Glasgow to the Border, . . . .	260	3	2	6	183	6	1	19	160	9	3	15	171	13	1	3
Totals, . . . .	2,771	7	-	6	2,034	17	1	16	1,865	15	3	8	2,056	15	4	3

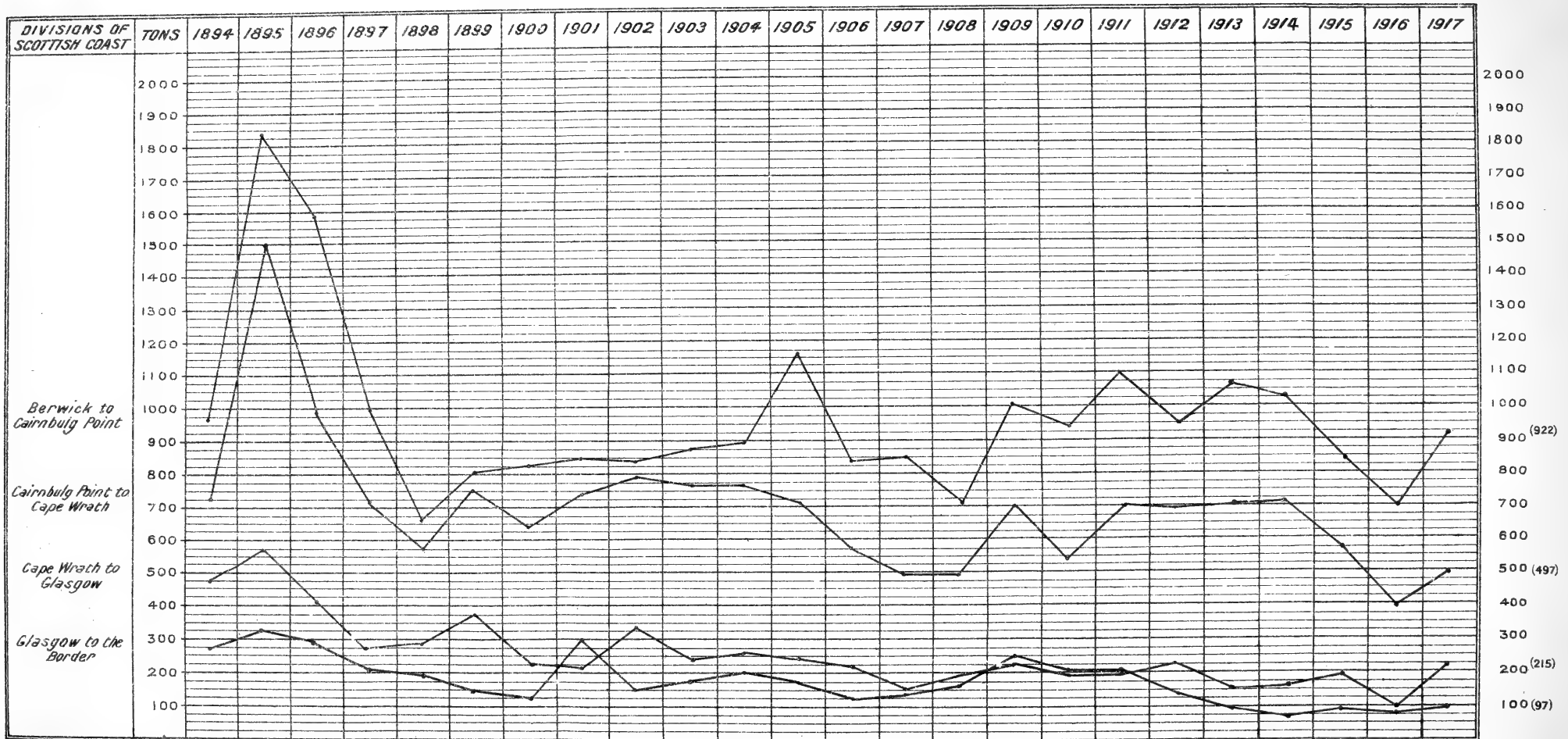
  

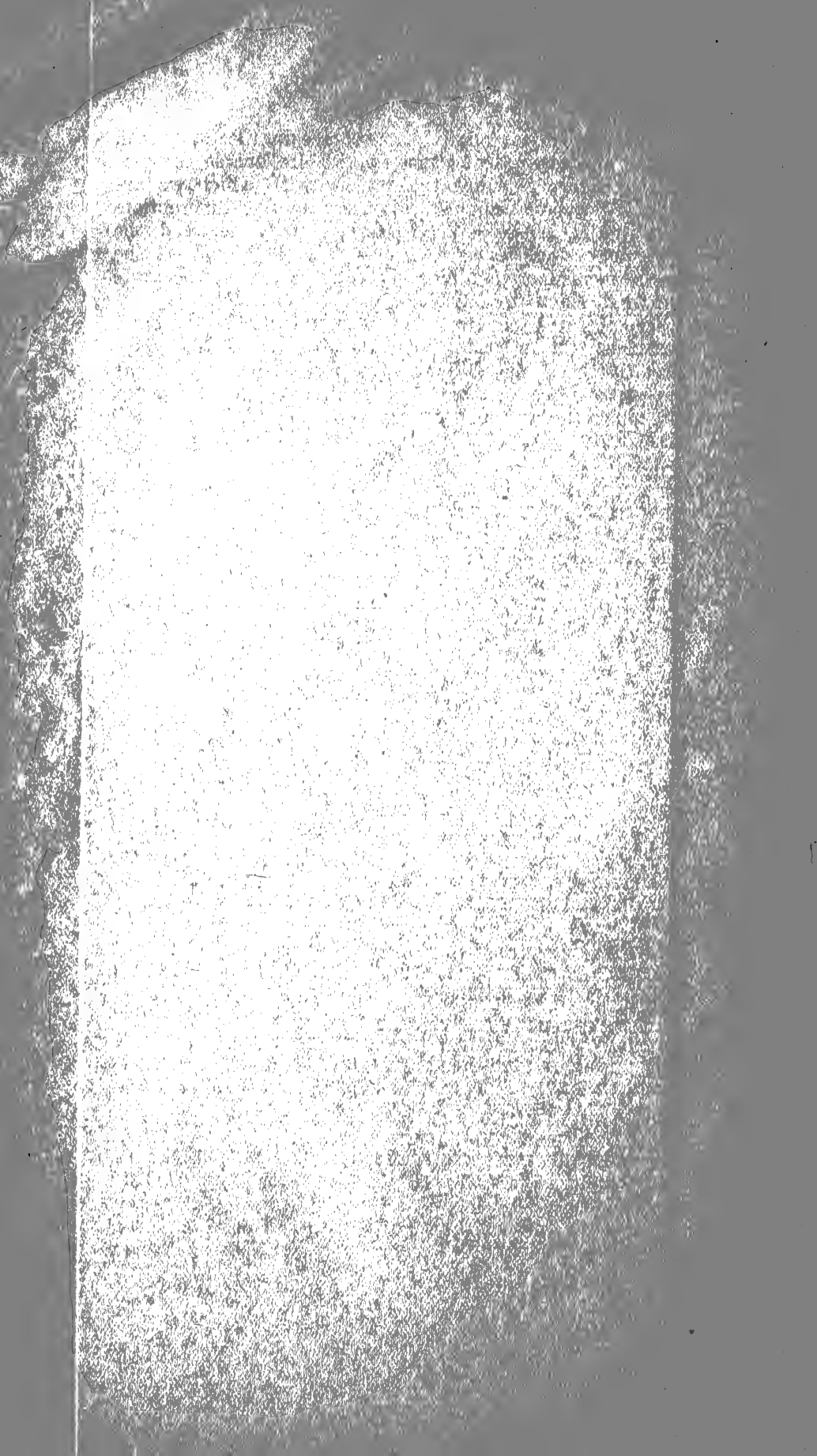
District.	Year 1914.				Year 1915.				Year 1916.				Year 1917.			
	Tons.	Cwts.	Qrs.	Lbs.	Tons.	Cwts.	Qrs.	Lbs.	Tons.	Cwts.	Qrs.	Lbs.	Tons.	Cwts.	Qrs.	Lbs.
a Berwick to Cairnbulg Point,	1,030	14	1	7	847	9	0	25	701	2	3	7	922	3	-	16
b Cairnbulg Point to Cape Wrath,	710	1	3	20	575	8	1	24	397	19	2	22	497	-	3	1
c Cape Wrath to Glasgow, . . . .	161	6	3	8	198	17	3	10	96	3	3	25	215	3	2	12
d Glasgow to the Border, . . . .	74	2	-	-	86	12	-	-	77	14	-	-	97	4	-	-
Totals, . . . .	1,976	5	-	7	1,708	7	2	3	1,273	-	1	26	1,731	11	2	1

There has again been great difficulty in obtaining sufficient men to work the various netting stations round the coast. As a result, fewer stations have been fished, a certain selection and regrouping of nets having become necessary. Nor does there seem any possibility of this difficulty being materially overcome in 1918.



CURVES SHOWING APPROXIMATELY THE TONS OF SALMON CARRIED BY  
SCOTTISH RAILWAYS & STEAMSHIPS SINCE 1894





Grilse were again of less relative importance in the total catch than used to be the case. Unfortunately, we are unable to state what the actual figure is, since the returns with which we are favoured, and which are sent gratuitously, do not differentiate between salmon and grilse. We have repeatedly deplored the absence of adequate statistics as to the salmon catch, and, as the capture of grilse seems more and more to decline, some more accurate knowledge of what is actually happening is highly desirable.

It has been pointed out by the Inspector that in the early part of last century the grilse taken at Berwick-upon-Tweed alone was not infrequently a hundred times greater than the present-day catch for the whole of Scotland, and that in a period of twenty years, when normal fluctuations would be included, the catch never fell below a figure thirty times as great as the present-day catch for the whole of Scotland.

In recent years, in accordance with the request that reports should be abbreviated, the annual statements from District Fishery Boards have been omitted. The actual catch in many districts is never reported, the Inspector being informed either that no record is kept, or that the information cannot be obtained. It is obvious, however, that the various salmon fishery tenants, and especially those who fish by net for commercial purposes, keep a careful record of all their catches. Extracting from the reports of the two last seasons the catches which are given in the case of certain more important districts, the following figures are available:—

The Tweed Commissioners, although not under the general supervision of the Board, have kindly sent a return annually since 1903. In 1916, the take by fixed engines in the sea was 5150, by sweep nets at the mouth of the river, 10,679, and by rods (approximately) 2451, making a total of 18,280 fish. These figures were regarded as below the average. In 1917, the respective figures were 9150, 25,188, and 2389, making a total of 36,727 fish, an increase of 18,447. The fixed net fishing was regarded as a good average, but the sweep netting and the results from rod fishing are still stated to be below the average.

The Findhorn District in 1916 produced, by fixed net, 11,004; by sweep net, 3172; and the return for the rods could not be given. In 1917 the result was, by fixed engine, 10,090; by sweep net, 2370; the total net catch for each year was therefore, in 1916, 14,176; in 1917, 12,460—a decrease of 1716 fish.

On the east coast of Sutherland, where, in peace time no netting was carried on to any great extent, two rivers have been netted in 1917 together with the catch by rod, resulting in a catch of 2907 salmon, including 79 sea trout.

The nets on the north coast of Sutherland where grilse preponderate in the catch, produced in 1916, 1292 fish, and in 1917, 5855 fish—an increase of 4563.

It is unfortunate that no records can be given as to important districts like those of the Tay, Dee, Don, North Esk, Spey, and others.

The following table gives the rentals, since the year 1900, of five important districts in Scotland:—

YEAR.	Tweed.	Tay.	N. Esk.	Dec.	Spey.
	£	£	£	£	£
1900 . . . . .	..	22,548	6,510	18,989	..
1901 . . . . .	..	22,558	6,466	19,418	8,608
1902 . . . . .	..	22,663	6,494	19,455	8,146
1903 . . . . .	15,338	22,648	6,494	18,393	8,147
1904 . . . . .	15,439	23,099	6,494	19,078	7,396
1905 . . . . .	15,499	22,675	6,489	19,332	8,364
1906 . . . . .	15,499	22,838	6,485	19,068	8,740
1907 . . . . .	15,732	23,202	6,490	18,940	8,990
1908 . . . . .	16,093	23,508	6,474	18,893	9,243
1909 . . . . .	16,092	23,715	6,614	18,335	9,396
1910 . . . . .	16,130	23,861	7,620	17,883	9,139
1911 . . . . .	16,130	23,873	7,617	18,005	9,129
1912 . . . . .	16,050	23,586	7,597	17,990	10,304
1913 . . . . .	15,930	23,584	7,597	18,153	11,228
1914 . . . . .	15,936	24,399	7,745	18,784	11,508
1915 . . . . .	16,104	24,105	7,830	18,953	11,226
1916 . . . . .	16,124	23,622	7,637	18,641	9,844
1917 . . . . .	15,686	22,849	7,637	17,673	9,867

We are indebted to the Fishmongers Company of London for the following return of the number of boxes of salmon marketed in or near London in 1917, with prices.

NUMBER OF BOXES OF SALMON delivered at or near Billingsgate in each month of 1917, also prices obtained for each month.

Month.	English.	Scottish.	Irish.	Canadian.	Totals.	English.	Scottish.	Irish.	Canadian.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
January . . . . .	..	..	40	49	89	..	..	4 6 $\frac{1}{2}$	1 2
February . . . . .	82	495	314	..	891	2 0	2 2 $\frac{1}{2}$	2 5 $\frac{1}{2}$	..
March . . . . .	333	702	1,061	..	2,096	2 6 $\frac{1}{2}$	2 7 $\frac{1}{2}$	2 5 $\frac{1}{2}$	..
April . . . . .	345	697	1,599	..	2,641	2 3 $\frac{1}{2}$	2 3 $\frac{1}{2}$	2 2 $\frac{1}{2}$	..
May . . . . .	648	1,126	2,615	..	4,389	2 0	2 0 $\frac{1}{2}$	1 11 $\frac{1}{2}$	..
June . . . . .	1,102	1,769	2,710	..	5,581	2 3 $\frac{1}{2}$	2 4 $\frac{1}{2}$	2 3 $\frac{1}{2}$	..
July . . . . .	628	2,885	683	..	4,196	1 11 $\frac{1}{2}$	2 2	1 11 $\frac{1}{2}$	..
August . . . . .	424	1,411	80	..	1,915	2 5	2 6 $\frac{1}{2}$	2 9	..
September . . . . .	277	241	4	31	553	3 1 $\frac{1}{2}$	3 0 $\frac{1}{2}$	2 11 $\frac{1}{2}$	1 5 $\frac{1}{2}$
October . . . . .	1	..	..	136	137	..	..	..	1 4 $\frac{1}{2}$
November . . . . .	..	..	..	145	145	..	..	..	1 5 $\frac{1}{2}$
December . . . . .	..	..	..	138	138	..	..	..	1 5 $\frac{1}{2}$
Totals . . . . .	3,840	9,326	9,106	499	22,771	..	..	..	..

## PART III.

## SCIENTIFIC INVESTIGATIONS.

During the year 1917, the scientific fishery investigations of the Board were carried on, under the supervision of Dr. T. Wemyss Fulton, the Scientific Superintendent, as far as possible on the same general lines as in previous years. The research work, with a somewhat reduced staff, has been done at the Marine Laboratory at the Bay of Nigg, and in the Laboratory at the Old Post Office, Aberdeen, and the inquiries relating to the herring fishery in Lochfyne have also been carried on as circumstances allowed.

## THE HATCHING OPERATIONS.

Owing to the fact that the research steamer "Goldseeker" was engaged in other duties, the stock of adult plaice has not been renewed since 1913. There remain, however, nearly one hundred of the old stock, and, as they had been well fed with mussels, a large number of fertilised eggs were obtained during the spawning season, viz. 2,950,000, of which over 2,700,000 were taken in March. Fertilised eggs were obtained from the pond from 13th February to 30th April, the largest collection on any one day amounting to 392,000 obtained on 13th March. The estimated number which died in the hatching boxes at one stage or another was 256,000, leaving nearly 2,700,000 which were liberated as fry in the neighbourhood of Aberdeen.

Since the hatching of the plaice was begun at the Bay of Nigg, the eggs which have been dealt with are estimated to amount to about 442,000,000, and over 347,000,000 fry of the plaice have been added to the sea, to enrich the inshore grounds.

## THE INVESTIGATIONS ON THE HERRING FISHERY IN LOCHFYNE.

The investigations in connection with the Lochfyne Herring Fishery, which have been described in previous Reports, were continued in 1917 so far as means allowed. The statistics show that the yield from this once important fishing still continues at a low level. The quantity of herrings landed amounted to only 899 cwts., as compared with 2576 cwts. last year, 13,399 cwts. in 1915, and 3214 cwts. in 1914. The following shows the monthly catch, in cwts., last year:—

January . . . . .	315	July . . . . .	139
February . . . . .	—	August . . . . .	360
March . . . . .	7	September . . . . .	21
April . . . . .	—	October . . . . .	—
May . . . . .	49	November . . . . .	—
June . . . . .	8	December . . . . .	—

It may be stated that the herring fishing at Ballantrae Bank, which is commonly supposed to be one of the spawning grounds of the Lochfyne herrings, was much more successful in the spring of

the year than for a considerable period, and yet the Lochfyne catch is the smallest on record.

Fluctuations in the herring fishery, especially in fjords or arms of the sea, are not infrequent on the coasts of other countries, and have been attributed to a variety of causes. In Lochfyne a series of temperature observations are made at different levels, and collections of the floating food secured, and it is proposed to continue these investigations until the herrings return to the Loch in their former abundance, so that comparison may be instituted between the observations taken in the period of scarcity and those taken in the period of abundance.

#### FISHERY INVESTIGATIONS IN THE NORTH SEA.

##### *Trawling and Other Investigations.*

The reduced staff have been kept busily engaged in working at the collections of various kinds, which were obtained in previous years, and also in dealing with the records of the observations and the statistics obtained. Among these may be mentioned the marking experiments on the plaice, in connection with the study of the migration and growth of that fish. A Report on this subject dealing with the marking experiments in the years 1910-1913 is now completed.

Other work on which the scientific staff have been engaged, and in regard to which Reports have either been completed, or are in course of preparation, includes the following:—The influence of herring-trawling on the fish supply; the closure of the Moray Firth to trawling; the determination of the age and growth of the herring and of the lemon sole from a study of the markings on the scales; the diseases of fishes; the drift-bottle experiments on marine currents; and the distribution of the pelagic eggs, and of the larval and post-larval stages of the food fishes.

We have the honour to be,

SIR,

Your most obedient Servants,

ANGUS SUTHERLAND, *Chairman.*

W. LYON MACKENZIE, *Deputy-Chairman.*

D'ARCY W. THOMPSON.

BREADALBANE.

JAMES ARCHIBALD.

MALCOLM SMITH.

DAVID T. JONES, *Staff Paymaster, R.N.R.,*  
*Secretary.*

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No.	District.	Number of Vessels.					Value of Vessels	Value of Fishing Gear.	Total Value.	No. of Fishermen and Boys.
		1st Class.		2nd Class.	3rd Class.	Total.				
		45 feet keel and upwards.	30 to 45 feet keel.	18 to 30 feet keel.	Under 18 feet keel.					
<b>EAST COAST.</b>										
1	Eyemouth . . . . .	...	2	17	...	19	575	758	1,333	40
2	Leith . . . . .	17	20	92	92	221	5,810	10,950	16,760	545
3	Anstruther . . . . .	2	1	58	10	71	1,695	890	2,585	203
4	Montrose . . . . .	...	14	23	29	66	660	520	1,180	124
5	Stonehaven . . . . .	...	2	11	17	30	371	1,892	2,263	88
6	Aberdeen . . . . .	...	...	23	6	29	463	1,273	1,736	75
7	Peterhead . . . . .	7	...	39	100	146	4,248	8,373	12,621	122
8	Fraserburgh . . . . .	64	5	11	270	350	30,200	35,400	65,600	420
9	Banff . . . . .	23	...	18	36	77	6,560	8,234	14,794	244
10	Buckie . . . . .	67	...	97	38	202	23,770	16,216	39,986	604
11	Findhorn . . . . .	15	...	49	28	92	7,144	9,405	16,549	225
12	Cromarty . . . . .	5	...	27	31	63	2,325	2,500	4,825	210
13	Helmsdale . . . . .	...	...	29	23	52	711	1,340	2,051	130
14	Lybster . . . . .	...	...	1	28	29	290	290	580	62
15	Wick . . . . .	1	...	3	83	87	827	482	1,309	200
East Coast Totals . . . . .		201	44	498	791	1,534	85,649	98,523	184,172	3,292
<b>Orkney and Shetland.</b>										
16	Orkney . . . . .	1	...	9	429	439	3,014	5,182	8,196	925
17	Shetland . . . . .	85	2	23	113	223	14,410	19,597	34,007	932
Orkney and Shetland Totals . . . . .		86	2	32	542	662	17,424	24,779	42,203	1,857
<b>WEST COAST.</b>										
18	Stornoway . . . . .	28	32	30	20	110	13,840	5,313	19,153	581
19	Barra . . . . .	2	18	38	43	101	2,233	4,450	6,683	323
20	Loch Broom . . . . .	...	2	34	132	168	3,715	3,958	7,673	289
21	Loch Carron & Skye . . . . .	...	2	53	105	160	1,495	5,068	6,563	287
22	Fort-William . . . . .	...	...	30	90	120	1,050	1,500	2,550	280
23	Campbeltown . . . . .	...	...	36	30	66	580	600	1,180	102
24	Inveraray . . . . .	...	...	34	28	62	843	1,003	1,846	120
25	Rothesay . . . . .	...	...	13	39	52	451	976	1,427	51
26	Greenock . . . . .	...	...	17	36	53	500	479	979	65
27	Ballantrae . . . . .	...	...	45	34	79	713	822	1,535	148
West Coast Totals . . . . .		30	54	330	557	971	25,420	24,169	49,589	2,246
Grand Totals for 1917 . . . . .		317	100	860	1,890	3,167	128,493	147,471	275,964	7,395
Grand Totals for 1916 . . . . .		353	129	943	2,033	3,458	136,247	139,568	275,815	7,984
Increase in 1917 . . . . .		...	...	...	...	...	...	7,903	149	...
Decrease in 1917 . . . . .		36	29	83	143	291	7,754	...	...	589



## APPENDIX A.

MEANS OF CAPTURE.—Particulars relating to the Vessels, Gear, and

## III. STEAM

No.	District.	Steam Liners and Steam Drifters.					Steam
		No. of Vessels.	Value of Vessels.	Value of Fishing Gear.	Total Value.	No. of Fishermen and Boys.	No. of Vessels.
<b>EAST COAST.</b>			£	£	£		
1	Eymouth . . . . .	1	900	460	1,360	9	...
2	Leith . . . . .	1	2,000	600	2,600	9	24
3	Anstruther . . . . .	6	12,000	1,696	13,696	32	...
4	Montrose . . . . .	...	...	...	...	...	3
5	Stonehaven . . . . .	...	...	...	...	...	...
6	Aberdeen . . . . .	{ 17 *16	{ 42,500 72,000	{ 9,000 3,780	{ 51,500 75,780	{ 153 144	{ } 67
7	Peterhead . . . . .	{ 30 †5	{ 54,000 11,000	{ 17,760 ...	{ 71,760 11,000	{ 315 ...	{ } 1
8	Fraserburgh . . . . .	{ 18 †4	{ 40,500 10,000	{ 9,000 2,000	{ 49,500 12,000	{ 90 36	{ } ...
9	Banff . . . . .	3	5,100	1,578	6,678	21	...
10	Buckie . . . . .	{ 55 †1	{ 131,000 2,000	{ 20,460 372	{ 151,460 2,372	{ 373 5	{ } ...
11	Findhorn . . . . .	{ 5 †1	{ 10,000 2,000	{ 3,050 720	{ 13,050 2,720	{ 41 9	{ } ...
12	Cromarty . . . . .	...	...	...	...	...	...
13	Helmsdale . . . . .	1	1,500	410	1,910	...	...
14	Lybster . . . . .	...	...	...	...	...	...
15	Wick . . . . .	3	3,465	1,300	4,765	27	...
<b>East Coast Totals . . . . .</b>		<b>167</b>	<b>399,965</b>	<b>72,186</b>	<b>472,151</b>	<b>1,264</b>	<b>95</b>
<b>Orkney and Shetland.</b>							
16	Orkney . . . . .	...	...	...	...	...	...
17	Shetland . . . . .	{ 2 †32	{ 2,500 73,600	{ 620 10,432	{ 3,120 84,032	{ 18 320	{ } ...
<b>Orkney and Shetland Totals . . . . .</b>		<b>34</b>	<b>76,100</b>	<b>11,052</b>	<b>87,152</b>	<b>338</b>	<b>...</b>
<b>WEST COAST.</b>							
18	Stornoway . . . . .	{ 13 †4	{ 13,000 4,800	{ 3,293 1,103	{ 16,293 5,903	{ 117 36	{ } ...
19	Barra . . . . .	...	...	...	...	...	...
20	Loch Broom . . . . .	...	...	...	...	...	...
21	Loch Carron and Skye . . . . .	...	...	...	...	...	...
22	Fort-William . . . . .	*†1	900	400	1,300	...	1
23	Campbeltown . . . . .	...	...	...	...	...	...
24	Inveraray . . . . .	...	...	...	...	...	...
25	Rothsay . . . . .	...	...	...	...	...	...
26	Greenock . . . . .	...	...	...	...	...	4
27	Ballantrae . . . . .	...	...	...	...	...	...
<b>West Coast Totals . . . . .</b>		<b>18</b>	<b>18,700</b>	<b>4,796</b>	<b>23,496</b>	<b>153</b>	<b>5</b>
<b>Grand Totals for 1917 . . . . .</b>		<b>219</b>	<b>494,765</b>	<b>88,034</b>	<b>582,799</b>	<b>1,755</b>	<b>100</b>
<b>Grand Totals for 1916 . . . . .</b>		<b>196</b>	<b>422,550</b>	<b>74,336</b>	<b>496,886</b>	<b>1,587</b>	<b>137</b>
<b>Increase in 1917 . . . . .</b>		<b>23</b>	<b>72,215</b>	<b>13,698</b>	<b>85,913</b>	<b>168</b>	<b>...</b>
<b>Decrease in 1917 . . . . .</b>		...	...	...	...	...	<b>37</b>

\* These 17 vessels represent the only steam liners distinct from drifters operating from Scottish ports during 1917.

† These 48 vessels represent the only steam drifters or liners other than Scottish operating from Scottish ports during 1917.

—No. I.—continued.

Men actually employed in the Scottish Fishing Industry in the Year 1917.

VESSELS.

Trawlers.				Total Steam Fishing Vessels.					No.
Value of Vessels.	Value of Fishing Gear.	Total Value.	No. of Fishermen and Boys.	No. of Vessels.	Value of Vessels.	Value of Fishing Gear.	Total Value.	No. of Fishermen and Boys.	
£	£	£			£	£	£		
...	...	...	...	1	900	460	1,360	9	1
74,000	3,600	77,600	216	25	76,000	4,200	80,200	225	2
...	...	...	...	6	12,000	1,696	13,696	32	3
15,000	750	15,750	27	3	15,000	750	15,750	27	4
...	...	...	...	...	...	...	...	...	5
335,000	12,060	347,060	612	100	449,500	24,840	474,340	909	6
4,440	160	4,600	9	36	69,440	17,920	87,360	324	7
...	...	...	...	22	50,500	11,000	61,500	126	8
...	...	...	...	3	5,100	1,578	6,678	21	9
...	...	...	...	56	133,000	20,832	153,832	378	10
...	...	...	...	6	12,000	3,770	15,770	50	11
...	...	...	...	...	...	...	...	...	12
...	...	...	...	1	1,500	410	1,910	...	13
...	...	...	...	...	...	...	...	...	14
...	...	...	...	3	3,465	1,300	4,765	27	15
428,440	16,570	445,010	864	262	828,405	88,756	917,161	2,128	
...	...	...	...	...	...	...	...	...	16
...	...	...	...	34	76,100	11,052	87,152	338	17
...	...	...	...	34	76,100	11,052	87,152	338	
...	...	...	...	17	17,800	4,396	22,196	153	18
...	...	...	...	...	...	...	...	...	19
...	...	...	...	...	...	...	...	...	20
...	...	...	...	...	...	...	...	...	21
850	150	1,000	...	2	1,750	550	2,300	...	22
...	...	...	...	...	...	...	...	...	23
...	...	...	...	...	...	...	...	...	24
...	...	...	...	...	...	...	...	...	25
32,000	640	32,640	36	4	32,000	640	32,640	36	26
...	...	...	...	...	...	...	...	...	27
32,850	790	33,640	36	23	51,550	5,586	57,136	189	
461,290	17,360	478,650	900	319	956,055	105,394	1,061,449	2,655	
601,900	23,520	625,420	1,240	333	1,024,450	97,856	1,122,306	2,827	
...	...	...	...	...	...	7,538	...	...	
140,610	6,160	146,770	340	14	68,395	...	60,857	172	

## APPENDIX A.—No. I.—continued.

MEANS OF CAPTURE.—Particulars relating to the Vessels, Gear, and Men actually employed in the Scottish Fishing Industry in the Year 1917.

## IV. ALL VESSELS.

No.	District.	No. of Vessels.	Value of Vessels.	Value of Fishing Gear.	Total Value.	No. of Fishermen and Boys.
<b>EAST COAST.</b>			£	£	£	
1	Eyemouth . . . . .	77	28,065	15,646	43,711	275
2	Leith . . . . .	310	101,980	20,840	122,820	1,042
3	Anstruther . . . . .	168	58,370	21,527	79,897	703
4	Montrose . . . . .	168	45,995	12,946	58,941	588
5	Stonehaven . . . . .	46	3,971	2,756	6,727	146
6	Aberdeen . . . . .	178	467,103	30,337	497,440	1,213
7	Peterhead . . . . .	214	88,323	32,805	121,128	576
8	Fraserburgh . . . . .	468	152,380	77,200	229,580	906
9	Banff . . . . .	149	34,460	21,501	55,961	575
10	Buckie . . . . .	312	210,930	56,814	267,744	1,358
11	Findhorn . . . . .	137	31,204	18,920	50,124	455
12	Cromarty . . . . .	63	2,325	2,500	4,825	210
13	Helmsdale . . . . .	68	5,402	2,140	7,542	190
14	Lybster . . . . .	30	370	314	684	66
15	Wick . . . . .	143	15,012	5,227	20,239	397
<b>East Coast Totals . . . . .</b>		<b>2,531</b>	<b>1,245,890</b>	<b>321,473</b>	<b>1,567,363</b>	<b>8,700</b>
<b>Orkney and Shetland.</b>						
16	Orkney . . . . .	460	4,039	5,580	9,619	975
17	Shetland . . . . .	285	106,215	35,823	142,038	1,411
<b>Orkney and Shetland Totals . . . . .</b>		<b>745</b>	<b>110,254</b>	<b>41,403</b>	<b>151,657</b>	<b>2,386</b>
<b>WEST COAST.</b>						
18	Stornoway . . . . .	135	35,070	10,604	45,674	788
19	Barra . . . . .	107	4,273	5,275	9,548	359
20	Loch Broom . . . . .	185	6,883	5,896	12,779	351
21	Loch Carron and Skye . . . . .	228	12,595	11,951	24,546	545
22	Fort-William . . . . .	147	7,494	3,062	10,556	340
23	Campbeltown . . . . .	131	10,130	4,890	15,020	382
24	Inveraray . . . . .	123	8,343	2,731	11,074	358
25	Rothsay . . . . .	69	2,777	1,881	4,658	104
26	Greenock . . . . .	79	36,172	2,365	38,537	168
27	Ballantrae . . . . .	129	7,033	3,722	10,755	319
<b>West Coast Totals . . . . .</b>		<b>1,333</b>	<b>130,770</b>	<b>52,377</b>	<b>183,147</b>	<b>3,714</b>
<b>Grand Totals for 1917 . . . . .</b>		<b>4,609</b>	<b>1,486,914</b>	<b>415,253</b>	<b>1,902,167</b>	<b>14,800</b>
<b>Grand Totals for 1916 . . . . .</b>		<b>4,650</b>	<b>1,461,182</b>	<b>366,164</b>	<b>1,827,346</b>	<b>14,392</b>
<b>Increase in 1917 . . . . .</b>		...	<b>25,732</b>	<b>49,089</b>	<b>74,821</b>	<b>408</b>
<b>Decrease in 1917 . . . . .</b>		41	...	...	...	...

APPENDIX B.—No. I.

FISH LANDED.—STATEMENT of the Total Quantity and Value of **Herrings** landed by Steam, Motor, and Sailing Boats respectively in **Scotland** during the various Seasons of the Year 1917.

No.	DISTRICTS.	Winter. (1st Jan. to 31st Mar.)								Early Summer. (1st April to 30th June).	
		Steam.		Motor.		Sail.		TOTAL.		Steam.	
		Cwts. Landed.	Value.	Cwts. Landed.	Value.	Cwts. Landed.	Value.	Cwts. Landed.	Value.	Cwts. Landed.	Value.
	<b>EAST COAST.</b>		£		£		£		£		£
1	Eyemouth . . . . .									126	81
2	Leith . . . . .			3,116	4,248	9,340	14,028	12,456	18,276		
3	Anstruther . . . . .			9,424	14,385	10,383	14,549	19,807	28,934		
4	Montrose . . . . .						238		225		
5	Stonehaven . . . . .										
6	Aberdeen . . . . .	3						3	2	2	2
7	Peterhead . . . . .	86	67					86	67	21,583	17,450
8	Fraserburgh . . . . .									15,278	9,873
9	Banff . . . . .									259	190
10	Buckie . . . . .										
11	Findhorn . . . . .					110	123	110	123	5	3
12	Cromarty . . . . .					30	32	30	32		
13	Helmsdale . . . . .										
14	Lybster . . . . .										
15	Wick . . . . .			21	36	1,211	775	1,232	811		
	East Coast Totals carried down . . . . .	89	69	12,561	18,669	21,312	29,732	33,962	48,470	37,258	27,599
	<b>ORKNEY AND SHETLAND.</b>										
16	Orkney . . . . .										
17	Shetland . . . . .	32,259	17,662	1,417	827	129	65	33,805	18,554	8,729	6,548
	Orkney and Shetland Totals cd. down . . . . .	32,259	17,662	1,417	827	129	65	33,805	18,554	8,729	6,548
	<b>WEST COAST.</b>										
18	Stornoway . . . . .	252,392	144,343	105,815	55,942	26,246	12,462	384,453	212,747	5,691	4,332
19	Barra . . . . .			945	497	8,601	3,336	9,546	3,833	92	30
20	Loch Broom . . . . .	2,451	1,645	7,698	3,663	8,775	4,283	18,924	9,591		
21	Loch Carron & Skye . . . . .	43,834	35,375	40,586	28,915	11,083	7,958	95,508	72,248	1,645	2,288
22	Fort-William . . . . .	117,051	97,149	85,506	75,194	1,383	1,744	203,940	174,087	35,477	42,857
23	Campbeltown . . . . .			17,553	25,872	483	715	18,036	26,587		
24	Inveraray . . . . .			322	253			322	253		
25	Rothsay . . . . .			1,197	1,195	49	46	1,246	1,241		
26	Greenock . . . . .			812	982	344	408	1,156	1,390		
27	Ballantrae . . . . .			31,834	32,788	1,049	1,417	32,883	34,205		
	West Coast Totals carried down . . . . .	415,728	278,512	292,268	225,301	58,018	32,369	766,014	536,182	42,905	49,507
	<b>TOTALS brought down.</b>										
	East Coast . . . . .	89	69	12,561	18,669	21,312	29,732	33,962	48,470	37,258	27,599
	Orkney & Shetland . . . . .	32,259	17,662	1,417	827	129	65	33,805	18,554	8,729	6,548
	West Coast . . . . .	415,728	278,512	292,268	225,301	58,018	32,369	766,014	536,182	42,905	49,507
	Grand Tls. for 1917 . . . . .	448,078	296,243	306,246	244,797	79,459	62,166	833,781	603,206	88,892	83,654
	Grand Tls. for 1916 . . . . .	263,305	184,756	96,826	69,532	28,781	23,074	393,912	277,362	135,946	70,309
	Increase in 1917 . . . . .	179,771	111,487	209,420	175,265	50,678	39,092	439,869	325,844		13,345
	Decrease in 1917 . . . . .									47,054	

## APPENDIX B.—

## FISH LANDED.—STATEMENT of the Total Quantity and Value in Scotland during the

No.	DISTRICTS.	Early Summer—continued. (1st April to 30th June).						Great Summer and Autumn. (1st July to 31st Dec.)			
		Motor.		Sail.		TOTAL.		Steam.		Motor.	
		Cwts. Landed.	Value.	Cwts. Landed.	Value.	Cwts. Landed.	Value.	Cwts. Landed.	Value.	Cwts. Landed.	Value.
	<b>EAST COAST.</b>		£		£		£		£		£
1	Eyemouth . . . . .	11,007	7,880	..	..	11,133	7,961	2,089	1,407	40,740	27,951
2	Leith . . . . .	56	126	1,511	3,014	1,567	3,140	..	..	..	..
3	Anstruther . . . . .	347	656	362	602	709	1,258	..	..	1,128	1,895
4	Montrose . . . . .	..	..	..	..	..	..	..	..	..	..
5	Stonehaven . . . . .	..	..	..	..	..	..	..	..	..	..
6	Aberdeen . . . . .	..	..	..	..	2	2	1,957	1,876	291	373
7	Peterhead . . . . .	7,291	6,216	6,583	4,829	35,462	28,495	80,259	56,751	32,351	22,559
8	Fraserburgh . . . . .	25,602	15,861	36,365	20,319	77,245	46,053	65,891	44,194	139,530	89,296
9	Banff . . . . .	1,470	1,090	1,417	1,075	3,146	2,355	1,463	968	1,964	1,395
10	Buckie . . . . .	1,260	953	5,545	3,386	6,805	4,339	3,476	2,391	3,083	1,967
11	Findhorn . . . . .	18	25	360	265	383	293	117	67	672	781
12	Cromarty . . . . .	..	..	21	18	21	18	..	..	..	..
13	Helmsdale . . . . .	..	..	..	..	..	..	..	..	70	50
14	Lybster . . . . .	..	..	..	..	..	..	..	..	..	..
15	Wick . . . . .	70	79	35	17	105	96	..	..	2,574	2,465
	East Coast Totals carried down . . . . .	47,121	32,886	52,199	33,525	136,578	94,010	155,252	107,654	222,403	148,732
	<b>ORKNEY AND SHETLAND.</b>										
16	Orkney . . . . .	..	..	..	..	..	..	..	..	..	..
17	Shetland . . . . .	5,484	2,149	31,878	9,961	46,091	18,658	3,037	1,655	5,883	3,073
	Orkney and Shetland Totals cd. down . . . . .	5,484	2,149	31,878	9,961	46,091	18,658	3,037	1,655	5,883	3,073
	<b>WEST COAST.</b>										
18	Stornoway . . . . .	2,342	1,783	4,756	2,945	12,789	9,060	18,249	16,967	5,711	6,022
19	Barra . . . . .	122	66	2,950	1,390	3,164	1,488	..	..	1,259	879
20	Loch Broom . . . . .	231	140	322	217	553	357	63	51	891	441
21	Loch Carron & Skye . . . . .	1,868	1,670	318	232	3,831	4,190	11,183	24,691	15,016	24,636
22	Fort-William . . . . .	54,901	63,631	8,066	6,202	98,444	112,690	20,519	37,369	22,404	49,501
23	Campbeltown . . . . .	33,165	44,725	..	..	33,165	44,725	..	..	34,486	53,763
24	Inveraray . . . . .	57	42	..	..	57	42	..	..	327	234
25	Rothsay . . . . .	721	840	196	158	917	998	..	..	1,548	1,419
26	Greenock . . . . .	1,757	2,133	186	160	1,943	2,293	..	..	1,907	2,023
27	Ballantrae . . . . .	7,783	7,793	293	449	8,076	8,242	..	..	15,281	19,232
	West Coast Totals carried down . . . . .	102,947	122,823	17,087	11,753	162,939	184,083	50,014	79,078	98,630	158,155
	<b>TOTALS brought down.</b>										
	East Coast . . . . .	47,121	32,886	52,199	33,525	136,578	94,010	155,252	107,654	222,403	148,732
	Orkney & Shetland . . . . .	5,484	2,149	31,878	9,961	46,091	18,658	3,037	1,655	5,883	3,073
	West Coast . . . . .	102,947	122,823	17,087	11,753	162,939	184,083	50,014	79,078	98,630	158,155
	Grand Tls. for 1917 . . . . .	155,552	157,858	101,164	55,239	345,608	296,751	208,303	188,387	326,916	309,960
	Grand Tls. for 1916 . . . . .	96,914	64,260	128,625	53,914	361,485	188,485	402,414	285,874	411,446	323,804
	Increase in 1917 . . . . .	58,638	93,598	..	1,325	..	108,268	..	..	84,590	13,844
	Decrease in 1917 . . . . .	..	..	27,461	..	15,877	..	194,111	97,487	..	..



No. I.—continued.

of Herrings landed by Steam, Motor, and Sailing Boats respectively various Seasons of the Year 1917.

Great Summer and Autumn—contd. (1st July to 31st Dec.)				TOTALS.						GRAND TOTAL.		No.
Sail.		TOTAL.		Steam.		Motor.		Sail.		Cwts. Landed.	Value. £	
Cwts. Landed.	Value. £	Cwts. Landed.	Value. £	Cwts. Landed.	Value. £	Cwts. Landed.	Value. £	Cwts. Landed.	Value. £			
..	..	42,829	29,358	2,215	1,488	51,747	35,831	..	..	58,962	37,319	1
1,211	1,676	1,211	1,676	..	..	3,172	4,374	12,062	18,718	15,234	23,092	2
89	178	1,217	2,073	..	..	10,899	16,936	10,834	15,329	21,733	32,265	3
1,280	1,995	1,280	1,995	..	..	..	..	1,518	2,220	1,518	2,220	4
3	3	3	3	..	..	..	..	3	3	3	3	5
67	53	2,315	2,302	1,962	1,880	291	373	67	53	2,320	2,306	6
18,431	12,549	131,041	91,859	101,933	74,268	39,642	28,775	25,014	17,378	168,589	120,421	7
143,041	84,937	348,462	218,427	81,169	54,067	165,132	105,157	179,406	105,256	425,707	264,480	8
2,594	1,527	6,021	3,890	1,722	1,153	3,434	2,485	4,011	2,602	9,167	6,245	9
6,729	4,304	13,288	8,662	3,476	2,391	4,343	2,920	12,274	7,690	20,093	13,001	10
11,004	12,962	11,793	13,810	122	70	690	806	11,474	13,350	12,286	14,226	11
448	537	448	537	..	..	..	..	499	587	499	587	12
91	74	161	124	..	..	70	50	91	74	161	124	13
574	435	574	435	..	..	..	..	574	435	574	435	14
329	208	2,903	2,673	..	..	2,665	2,580	1,575	1,000	4,240	3,580	15
185,891	121,438	563,546	377,824	192,599	135,322	282,085	200,287	259,402	184,695	734,086	520,304	
31,546	15,817	40,466	20,545	44,025	25,865	12,784	6,049	63,553	25,843	120,362	57,757	16
31,546	15,817	40,466	20,545	44,025	25,865	12,784	6,049	63,553	25,843	120,362	57,757	17
14,421	8,014	38,381	31,003	276,332	165,642	113,368	63,747	45,423	23,421	435,623	252,810	18
2,437	1,740	3,746	2,619	92	30	2,326	1,442	14,038	6,466	16,456	7,988	19
9,239	4,966	10,193	5,458	2,514	1,696	8,820	4,244	18,336	9,466	29,670	15,406	20
8,221	6,675	34,420	56,002	56,662	62,354	57,470	55,221	19,627	14,865	133,759	132,440	21
3,610	4,600	46,533	91,470	173,047	177,375	162,811	188,326	13,059	12,546	348,917	378,247	22
990	1,010	35,476	54,773	..	..	85,204	124,360	1,473	1,725	86,677	126,085	23
193	112	520	346	..	..	706	529	193	112	899	641	24
630	564	1,978	1,983	..	..	3,286	3,454	875	768	4,141	4,222	25
375	385	2,282	2,393	..	..	4,476	5,143	905	933	5,381	6,076	26
135	219	15,416	19,451	..	..	54,898	59,813	1,477	2,085	56,375	61,898	27
40,301	23,265	188,945	265,498	508,647	407,097	493,845	506,279	115,406	72,387	1,117,898	985,763	
185,891	121,438	563,546	377,824	192,599	135,322	282,085	200,287	259,402	184,695	734,086	520,304	
31,546	15,817	40,466	20,545	44,025	25,865	12,784	6,049	63,553	25,843	120,362	57,757	
40,301	23,265	188,945	265,498	508,647	407,097	493,845	506,279	115,406	72,387	1,117,898	985,763	
257,738	165,520	792,957	663,867	745,271	568,234	788,714	712,615	438,361	282,925	1,972,346	1,563,824	
516,920	275,086	1,330,780	834,764	806,665	540,939	605,186	457,596	674,326	352,074	2,086,177	1,350,609	
259,182	109,566	537,823	220,897	61,394	27,345	183,528	255,019	235,965	69,149	113,831	213,215	



Whittings	844	1,883	250	564	1,084	2,447	1,094	2,447	1,126	2,623
Conger Eels	74	126	1	2	75	128	75	128	..	..
Gurnards	..	..	..	..	..	..	..	..	..	..
Catfish	153	198	40	52	198	245	193	245	176	151
Monks (Anglers)	..	..	..	..	..	..	..	..	..	..
Hake	..	..	..	..	..	..	..	..	..	..
<b>Total of Round Fish.</b>	12,959	32,264	3,415	8,235	16,374	40,499	16,374	40,499	14,831	33,571
<b>FLAT.</b>										
Turbot	..	..	..	..	..	..	..	..	..	..
Hailbut	..	..	..	..	..	..	..	..	..	..
Lemon Soles	44	178	2	6	46	184	46	184	..	..
Flounders	17	67	5	19	22	86	22	86	45	191
Plaice, Large	..	..	..	..	..	..	..	..	..	..
" Medium	..	..	..	..	..	..	..	..	..	..
" Small	..	..	..	..	..	..	..	..	..	..
Brill	..	..	..	..	..	..	..	..	..	..
Dabs	..	..	..	..	..	..	..	..	..	..
Whitches	..	..	..	..	..	..	..	..	..	..
Megrims	..	..	..	..	..	..	..	..	..	..
<b>Total of Flat Fish</b>	61	245	7	25	68	270	68	270	45	191
Skates and Rays	..	..	..	..	..	..	..	..	..	..
Squids	116	180	2	2	118	162	118	162	..	..
Unclassified kinds	..	..	..	..	..	..	..	..	..	..
<b>GRAND TOTALS</b>	13,136	32,669	3,424	8,262	16,560	40,931	17,796	40,931	15,339	34,346

SHELL-FISH.

	Oysters.	Lobsters.	Crabs.	Mussels.	Clams.	Unclassified.
	No.	No.	No.	Cwts.	Cwts.	Cwts.
TOTAL VALUE OF ALL FISH	..	£ 4,830	£ 193,500	£ 1,979	£ ..	£ 2,218
Fish used for Manure (included above)	..	232	..	..	..	81,036
" Bait ( " )	..	..	..	..	..	207
" " ( " )	..	..	..	..	..	157
" " ( " )	..	..	..	..	..	1,897
" " ( " )	..	..	..	..	..	69,243
" " ( " )	..	..	..	..	..	198













Table with columns for fish species, quantity, and value. Includes sections for 'Total of Round Fish', 'FLAT.', 'Total of Flat Fish', 'Skates and Rays', and 'SHELL-FISH'.

TOTAL VALUE OF ALL FISH used for Manure (included above)

\* Included are 786 landings by motor trawlers, representing an aggregate absence from port of 1183 days, and totalling 3969 cwts. (mostly plaice), value £10,823.













Whittings	2	146	151	1,049	1,106	1,195	1,257						1,197	1,259	1,586	1,041
Conger Eels		11	14	17	11	28	25						28	25	113	58
Gurnards	11	10	8	8	8	18	16						30	27	10	8
Catfish		2	2	12	13	14	15						14	15		
Monks (Anglers)																
Hake																
Total of Round Fish.	58	973	1,921	7,850	14,005	8,823	15,926						8,881	16,053	8,858	10,006
<b>FLAT.</b>																
Turbot	2			5	13	8	26							37	2	4
Halibut		3		10	37	10	37						10	37	7	26
Lemon Soles		36	86	90	158	126	244						10	247	75	95
Flounders	1	2		16	90	18	100						127	100	106	349
Piaice, Large	42	211	942	428	1,756	639	2,698						681	2,937	1,002	2,989
Medium		45	156	224	676	269	823						269	832	157	335
Small																
Brill		67	147	137	264	204	411						208	420	385	515
Dabs	4															
Whites																
Megrings																
Total of Flat Fish	49	364	1,354	910	2,994	1,274	4,348						1,323	4,610	1,734	4,313
Skates and Rays	13	64	36	58	127	122	163						135	171	4	3
Squids														5	22	12
Unclassified kinds	1			7	4	7	4						8	5		
GRAND TOTALS	121	1,401	3,311	8,838	17,137	10,239	20,448	107,000	76,467	41,542	29,627	25,829	17,804	144,744	283,009	183,818

SHELL-FISH.

Oysters. £  
No. 284

Lobsters. £  
No. 26

Crabs.  
No. 786

Mussels. £  
Cwts. 1,630

Clams. £  
Cwts. 67

Unclassified.  
Cwts. £

TOTAL VALUE OF ALL FISH  
Fish used for Manure (included above)

" Bait ( " )

105  
144,849  
88  
183,906































		20	32	20	32	20	32	20	32	20	32	20	32	20	32	20	32	16	10	
<b>Whings</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
<b>Conger Eels</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
<b>Gurnards</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
<b>Catfish</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
<b>Monks (Anglers)</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
<b>Hake</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
<b>Total of Round Fish</b>		106	160	2,274	3,099	2,380	3,259	2,380	3,259	2,380	3,259	2,380	3,259	2,380	3,259	2,380	3,259	2,196	1,796	
<b>FLAT.</b>																				
<b>Turbot</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Hallibut</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Lemon Soles</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Flounders</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Plaice, Large</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>" Medium</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>" Small</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Brill</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Dabs</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Whittches</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Megrim</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Total of Flat Fish</b>		..	..	2	7	2	7	2	7	2	7	2	7	2	7	2	7	1	1	
<b>SHELL-FISH.</b>																				
<b>Oysters</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>No.</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>£</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>£</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Unclassified.</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Cwts.</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>£</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Crabs</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>No.</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>£</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>£</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Mussels</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Cwts.</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>£</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Clams</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Cwts.</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>£</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Skates and Rays</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Squids</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>Unclassified kinds</b>		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>GRAND TOTALS</b>		106	160	2,290	3,130	2,396	3,290	2,396	3,290	2,396	3,290	2,396	3,290	2,396	3,290	2,396	3,290	3,912	2,964	

TOTAL VALUE OF ALL FISH  
 Fish used for Manure (included above) £ 57  
 " " " " " " 3,021  
 " " " " " " 74  
 " " " " " " 3,799

APPENDIX B.—No. II.—RETURN respecting Vessels arriving and Fish landed in the District of Wick during the Year 1917, and showing the catch and value during the previous Year.

Method of Fishing.	Trawls.			Lines.						Nets.			1917.		1916.								
	Steam.		Total.	Motor.		Sail.		Total.		Steam.		Motor.		Sail.		Total.		Cwt.	£				
	Quantity.	Value.		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.						
No. of Vessels arriving Aggregate No. of Days absent from Port	..	..	4,018	4,540	8,558	..	..	605	358	963	..	..	..	..	..	..	..	..	..				
Description of Fish.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Cwt.	£					
	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£					
<b>PELAGIC FISH—</b>																							
Herrings	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..				
Sprats	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..				
Sparings	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..				
Mackerel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..				
Total of Pelagic Fish.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,714	2,604	1,591	1,009	4,305	3,613	
<b>DEMERSAL FISH—</b>																							
<b>ROUND.</b>																							
Cod	..	..	19,792	18,097	19,021	26,811	..	..	7,076	11,253	..	..	..	..	..	..	..	..	..	..	..	..	..
Codling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Torsk (Tusk)	..	..	16	16	16	16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Saithe (Coal Fish)	..	..	380	440	577	630	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Haddock, ex. L.A.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" Large	..	..	1,291	2,594	1,354	3,665	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" Medium	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" Small	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total of Demersal Fish.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total of all Fish.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total Quantity	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,104	2,104	4,305	3,613	8,610	7,227	11,837
Total Value	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3,613	3,613	15,515	15,515	42,326	42,326	77,652







APPENDIX B.—No II.—RETURN respecting Vessels arriving and Fish landed in the District of Shetland during the Year 1917, and showing the catch and value during the previous Year.

Method of Fishing.	Trawls.				Lines.				Nets.				1917.		1916.			
	Steam.		Sail.		Motor.		Sail.		Steam.		Motor.		Sail.		Total.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Cwt.	£
No. of Vessels arriving	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Aggregate No. of Days absent from Port	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Description of Fish.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Cwt.	£
<b>PELAGIC FISH—</b>	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£
Herrings	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Codling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Torsk (Tusk)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Saithe (Coral Fish)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Haddock, ex. La.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Large	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Medium.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Small	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total of Pelagic Fish	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	473,311	217,852
<b>DEMERALS FISH—</b>	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Round.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cod	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Codling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Torsk (Tusk)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Saithe (Coral Fish)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Haddock, ex. La.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Large	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Medium.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Small	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total of Demersal Fish	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	470,680	217,201

























Whittings	1	3	27	28	27	28	28	28	28	28	31	39	41
Conger Eels	17	15	213	204	12,546	12,900	12,900	12,900	12,900	12,900	12,915	3,294	2,317
Gurnards	7	9	..	..	..	..	..	..	..	..	9	..	..
Catfish	10	11	..	..	..	..	..	..	..	..	11	..	..
Monks (Anglers)	21	28	27	65	1,289	3,090	3,090	3,090	3,090	3,090	3,118	137	188
Hake	..	..	..	..	..	..	..	..	..	..	..	..	..
Total of Round Fish	229	353	8,920	9,341	3,413	3,355	2,997	2,140	28,703	33,779	35,615	14,188	9,698
FLAT.	..	..	..	..	..	..	..	..	..	..	..	..	..
Turbot	2	15	3	14	3,502	819	5	3	4	4,324	6	..	..
Habibut	10	61	527	128	..	..	..	..	656	..	666	..	173
Lemon Soles	5	19	..	..	..	..	..	..	..	..	5	..	..
Flounders	..	..	..	..	..	..	..	..	..	..	..	..	..
Plaice, Large	..	..	..	..	..	..	..	..	..	..	..	..	..
" Medium	159	818	..	27	80	133	198	160	278	..	386	306	569
" Small	..	..	..	..	..	..	..	..	..	..	..	..	..
Brill	5	48	..	..	..	..	..	..	..	..	5	..	..
Dabs	12	20	..	..	..	..	..	..	..	..	12	..	..
Whitches	36	128	..	..	..	..	..	..	..	..	36	..	..
Megrims	4	15	..	..	..	..	..	..	..	..	4	..	..
Total of Flat Fish	233	1124	530	3,516	156	904	134	201	820	4,621	1,120	355	742
Skates and Rays	133	129	4,796	4,607	2,459	2,440	316	261	7,571	7,308	7,746	2,979	2,067
Squids	6	6	1,167	1,306	318	256	73	50	1,558	1,612	1,753	596	169
Unclassified kinds	..	..	..	..	..	..	..	..	..	..	..	..	..
GRAND TOTALS	601	1612	23,360	30,245	11,772	14,423	3,520	2,652	38,652	47,320	392,841	173,772	160,028

SHELL-FISH.

	Oysters.	Lobsters.	Crabs.	Mussels.	Clams.	Unclassified.
	No.	No.	No.	Cwts.	Cwts.	Cwts.
Total of Shell-Fish	500	3,000	3,000	1,900	669	2,584
TOTAL VALUE OF ALL FISH	£ 500	£ 1,503	£ 35	£ 1,900	£ 669	£ 162,612
Fish used for Manure (included above)	..	..	..	..	..	..
" Bait ( " " )	..	..	..	..	..	..











	187	180	4	12	4	12	137	130	4	12	4	12	4	12	6	6	
Whitings	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Conger Eels	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Gurnards	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Catfish	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Monks (Anglers)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Hake	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Total of Round Fish.	280	491	1,272	1,904	1,562	2,395	1,122	2,062	3,422	3,717	4,544	5,779	6,106	8,174	4,842	4,202	
FLAT.																	
Turbot	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Halibut	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lemon Soles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Flounders	..	..	20	46	20	46	21	105	62	252	83	357	103	403	30	63	
Plaice, Large	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" Medium	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" Small	5	20	40	107	45	127	362	2,037	..	..	362	2,037	407	2,164	76	159	
Brill	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dabs	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Whitches	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Megrims	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total of Flat Fish	5	20	60	153	65	173	383	2,142	62	252	445	2,394	510	2,567	106	222	
Skates and Rays	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Squids	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Unclassified kinds	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
GRAND TOTALS	342	542	1,352	2,057	1,674	2,599	6,906	9,021	4,987	5,191	11,893	14,212	13,567	16,811	49,153	33,847	

SHELL-FISH.

Oysters.	Lobsters.	Crabs.	Mussels.	Clams.	Unclassified.
No.	No.	No.	Cwts.	Cwts.	£
..	2,094	..	2,412	..	984
..	150	..	236	..	380
..	..	..	..	..	766
..	..	..	..	..	17,577
..	..	..	..	..	34,831

TOTAL VALUE OF ALL FISH.  
 Fish used for Manure (included above)  
 " " Bait ( " " )









Whittings	530	1,226	421	659	951	1,885	1	2	952	1,887	1,210	1,892
Conger Eels	314	440	69	116	383	556	10	3	383	556	662	858
Gurnards	..	..	..	..	..	..	..	..	10	3	..	..
Catfish	..	..	..	..	..	..	..	..	..	..	..	..
Monks (Anglers)	..	..	..	..	..	..	..	..	..	..	..	..
Hake	13	43	..	..	13	42	6	18	20	63	107	239
<b>Total of Round Fish.</b>	3,265	5,448	2,330	3,807	5,595	9,255	780	1,176	7,527	12,313	6,244	7,497
<b>FLAT.</b>												
Turbot	15	73	3	17	18	90	15	92	42	231	25	107
Halibut	9	36	..	..	9	36	..	..	9	36	5	15
Lemon Soles	..	..	1	6	1	6	6	38	7	44	1	6
Flounders	..	..	..	..	..	..	2	4	684	1,277	583	668
Plaice, Large	145	637	142	467	287	1,104	2,555	11,247	10,239	24,112	5,443	9,344
" Medium	..	..	..	..	..	..	..	..	..	..	..	..
" Small	..	..	..	..	..	..	..	..	..	..	..	..
Brill	..	..	..	..	..	..	104	188	133	231	1	3
Dabs	13	20	16	23	29	43	36	154	36	154	53	79
Whitches	..	..	..	..	..	..	..	..	..	..	..	..
Megrims	..	..	..	..	..	..	..	..	..	..	50	40
<b>Total of Flat Fish</b>	182	766	162	513	344	1,279	2,718	11,723	11,150	26,085	6,161	10,262
Skates and Rays	919	1,128	489	563	1,408	1,691	392	439	2,737	2,981	2,783	2,467
Squids	..	..	..	..	..	..	..	..	..	..	..	..
Unclassified kinds	..	..	2	3	2	3	..	..	8	4	36	21
<b>GRAND TOTALS</b>	7,348	10,526	7,342	3,014	4,923	7,380	62,736	76,117	82,080	106,817	57,268	62,886

SHELL-FISH.

Oysters	No.	£	Lobsters	No.	£	Crabs	No.	£	Mussels	No.	£	Clams	No.	£	Unclassified	£
277,500	1,129	..	3,811	210	..	7,400	39	..	3,198	478	..	73	41	..	6,470	7,407
Fish used for Manure (included above)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	113,287	70,293
" Bait	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

TOTAL VALUE OF ALL FISH

Fish used for Manure (included above)

" Bait









APPENDIX B.—No. II.—FISH LANDED.—STATEMENT of the Total Quantity and Value of the different kinds of White and Shell-Fish landed on the West Coast of Scotland during the Year 1917.

DESCRIPTION OF FISH.	TRAWAYS.						LINES.						NETS.						1917.		1916.	
	Steam.*		Motor.		Sail.		TOTAL.		Steam.		Motor.		Sail.		TOTAL.		Grand Total Quantity and Value.		Grand Total Quantity and Value.			
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Cwt.	£	Cwt.	£		
	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£						
<b>PELAGIC FISH.</b>																						
Herrings	..	..	..	..	..	..	..	508,647	407,097	493,611	506,170	115,640	72,496	1,117,898	985,763	866,855	651,356					
Sprats	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..					
Spurdogs	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..					
Mackerel	..	..	..	..	..	..	..	3,688	1,829	27,191	16,989	6,504	2,949	37,423	21,767	37,801	13,451					
Total of Pelagic Fish	..	..	..	..	..	..	..	512,255	408,926	520,802	523,159	122,262	75,676	1,155,349	1,007,761	904,687	664,998					
<b>DEMERSAL FISH.</b>																						
<i>(a) ROUND.</i>																						
Cod	23	43	4,543	6,968	6,180	8,881	9,695	12,165	20,418	27,915	27,915	2,072	3,830	3,019	4,697	5,091	8,527	25,537	36,484	25,590	19,926	
Codling	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Ling	7	6	3,903	5,309	1,549	2,080	2,875	3,086	8,327	10,475	10,475	46	71	1	1	47	72	8,381	10,553	3,060	3,258	
Torsk (Tusk)	2	2	199	156	43	85	154	103	396	204	204	..	..	..	..	..	..	..	..	..	..	
Saithe (Coal Fish)	3	3	3,014	3,200	2,374	1,918	7,198	3,692	12,586	8,750	8,750	5,859	6,820	3,662	3,504	9,521	10,324	22,110	19,077	20,512	10,118	
Haddock, ex. Ia.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
" Large	137	243	2	4	697	1,353	6,981	7,792	7,680	9,149	9,149	3	6	..	..	3	6	7,820	9,398	7,968	6,961	
" Medium	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
" Small	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Whiting	1	3	9,186	9,696	531	1,227	759	989	1,280	2,218	2,218	1	2	..	..	1	2	1,292	2,221	1,627	2,223	
Coner Reils	8	10	..	..	3,966	4,040	1,471	1,513	14,623	15,249	15,249	..	..	..	..	..	..	..	..	..	..	
Gurnards	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Carfish	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Monks (Anglers)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Hake	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Total of Round Fish.	240	372	21,618	27,177	15,881	20,756	29,693	29,774	67,192	77,707	77,707	8,994	14,515	6,757	8,897	15,751	22,912	83,183	100,991	83,953	51,291	



(b) FLAT.	Oysters.		Lobsters.		Crabs.		Mussels.		Clams.		Unclassified.		26 400 13 1,277 6,463 11,312
	No.	£	No.	£	No.	£	Cwt.	£	Cwt.	£	Cwt.	£	
Turbot . . . . .	5		14		23		15		92		24		286
Halibut . . . . .	11	602	16	1,004	13	329	78	5,414	32	1,116	6	1,127	5,479
Lemon Soles . . . . .	5		185	53	621	7	7	59	72	7	16	28	160
Flounders . . . . .	..	..	..	..	501	629	629	501	592	777	902	1,531	2,683
Plaice, Large . . . . .	7,049		210	808	1,430	1,189	2,238	3,332	15,173	609	3,941	12,179	30,457
" Medium . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..
" Small . . . . .	7	62	..	..	..	..	..	..	..	..	..	..	62
Brill . . . . .	13	22	13	20	25	31	104	188	188	5	109	194	153
Dabs . . . . .	36	128	..	..	..	..	36	154	154	6	36	72	282
Whittches . . . . .	5	18	..	..	..	..	3	6	6	..	3	8	24
Megrims . . . . .	7,131	11,526	430	2,022	2,606	3,004	8,372	3,631	16,217	1,400	3,569	15,166	39,684
Total of Flat Fish . . . . .	613	395	4,957	3,762	1,964	11,446	602	602	651	485	614	1,265	12,692
Skates and Rays . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..
Squids . . . . .	6	1,173	1,309	267	1,292	6,753	2,863	994	1,307	55	49	1,193	7,941
Unclassified kinds . . . . .	7,990	12,299	25,507	37,186	35,873	88,426	100,016	408,958	555,849	130,959	88,305	1,178,411	4,262
Total for 1917 . . . . .	4,711	6,750	7,683	13,884	26,592	62,020	47,132	365,630	277,883	307,460	98,082	1,063,112	11,664,427
Total for 1916 . . . . .	3,279	5,549	13,603	29,503	6,528	14,300	1,275	9,081	26,406	52,884	146,799	131,075	157,941
Increase in 1917 . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..
Decrease in 1917 . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..
													988,968
													737,307
													428,120
													1,808
													28,294
													30,102
													1,808

SHELL-FISH.

Oysters.	£ 1,139	No. 217,817	£ 15,750	No. 31,379	£ 231	£ 36,204	£ 2,361	£ 73	£ 41	£ 14,366	£ 8,772
Lobsters.	£ 15,750	No. 31,379	£ 231	£ 36,204	£ 2,361	£ 73	£ 41	£ 14,366	£ 8,772	£ 28,294	£ 30,102
Crabs.	£ 231	No. 31,379	£ 36,204	£ 2,361	£ 73	£ 41	£ 14,366	£ 8,772	£ 28,294	£ 30,102	£ 1,808
Mussels.	£ 2,361	No. 31,379	£ 36,204	£ 2,361	£ 73	£ 41	£ 14,366	£ 8,772	£ 28,294	£ 30,102	£ 1,808
Clams.	£ 41	No. 31,379	£ 14,366	£ 8,772	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102	£ 1,808	£ 1,808
Unclassified.	£ 8,772	No. 31,379	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102	£ 1,808
Total Value of Shell-Fish for 1917 . . . . .	£ 41	£ 14,366	£ 8,772	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102
Total Value of Shell-Fish for 1916 . . . . .	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102
Decrease in 1917 . . . . .	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102	£ 1,808	£ 28,294	£ 30,102

Grand Total Value of Fish and Shell-Fish for 1917, £1,193,721  
 " " " " " " " " 1916, 767,409  
 Increase in 1917, £426,312

\* Included are 7348 cwts., value £10,526, landed by sail trawlers in Ballantrae District.



(b) FLAT.	Oysters.		Lobsters.		Crabs.		Mussels.		Clams.		Shell-Fish.		Total Value of Shell-Fish for 1917	Total Value of Shell-Fish for 1916	Increase in 1917					
	No.	£	No.	£	No.	£	Cwt.	£	Cwt.	£	Cwt.	£								
Turbot	1,383	8,772	3	1,199	13	87	13	87	13	87	13	87	10	53	26	149	1,423	9,045	2,143	10,797
Halibut	2,030	10,906	14	6,711	87	4,010	817	4,010	87	4,010	817	4,010	8	26	20	72	4,905	23,979	13,416	51,029
Lennon Soles	8,087	45,374	168	720	75	235	243	1,005	588	8,420	46,967	19,807	588	90	90	334	8,420	46,967	19,807	80,105
Founders	388	825	82	193	1,062	1,397	1,144	1,500	150	581	1,509	2,765	1,659	3,346	1,485	3,346	3,186	5,761	4,185	5,359
Plaice, Large	25,248	84,375	1,618	5,404	8,041	21,455	9,659	26,859	6,505	26,411	1,757	4,566	8,262	30,977	43,169	30,977	43,169	142,211	43,890	110,616
" Medium	83	148	451	771	731	1,000	1,182	1,771	1	4	5	6	1	4	1	4	34	187	45	151
" Small	7,204	8,989	451	771	731	1,000	1,182	1,771	227	306	312	418	232	312	418	312	8,618	11,072	11,927	12,753
Dabs	2,181	9,041	..	..	..	..	..	..	44	171	..	..	44	..	44	171	2,175	9,212	3,340	9,333
Whiteches	2,469	9,856	..	..	..	..	..	..	5	10	..	..	5	..	5	10	2,470	9,866	2,144	5,902
Megrinus	48,944	178,411	6,725	3,176	11,185	10,739	26,350	15,117	44,269	7,050	28,213	3,289	7,416	10,339	35,629	74,400	258,300	100,897	286,075	
Total of Flat Fish	20,678	15,701	6,087	5,928	3,796	3,108	16,175	16,039	813	811	1,087	1,114	1,900	1,925	1,900	1,925	38,753	33,665	50,670	32,716
Skates and Rays	40	97	1,396	462	333	5,455	1,529	7,223	3,258	144	32	1,002	1,320	59	1,209	1,411	10,089	8,279	8,279	101
Squids	1,657	942	49,437	200,814	413,561	169,165	291,948	404,868	724,946	757,855	574,483	862,432	814,855	526,138	377,760	2,146,425	1,767,098	3,645,015	3,412,030	3,147,675
Unclassified kinds	528,480	1,152,971	88,468	125,631	160,450	23,013	193,189	207,173	447,102	566,817	816,411	543,645	638,895	507,411	751,275	410,398	2,226,581	1,461,424	..	..
Total for 1917	738,347	1,119,434	40,364	179,548	54,775	138,129	30,838	203,537	307,444	225,137	32,608	80,156	305,674	497,340	3,412,030	3,147,675	..	..	..	..
Total for 1916	..	33,537	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Increase in 1917	209,867	..	58,579	76,194	24,024	42,239	58,556	..	..	..	..	..	..	..	..	..	..	..	..	..
Decrease in 1917	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

SHELL-FISH.

Grand Total Value of Fish and Shell-Fish for 1917, £3,704,789  
 1916, £3,206,550  
 Increase in 1917, £498,239

\* Included are 17,620 cwts., value £39,523, landed by motor and sail trawlers.

## APPENDIX C.

FISH USED IN A FRESH STATE.—Table showing the Estimated Quantity of each Species of Fish consumed fresh in Scotland, or dispatched from Scotland in a fresh state, in the Year 1917.

Description of Fish.	1917.	1916.
	Quantity.	Quantity.
	Cwts.	Cwts.
Herrings . . . . .	666,889	442,292
Sprats . . . . .	36,856	12,119
Sparlings . . . . .	127	253
Mackerel . . . . .	58,943	49,595
Cod and Codlings . . . . .	313,160	313,900
Ling . . . . .	22,400	26,419
Torsk (Tusk) . . . . .	1,157	2,323
Saithe . . . . .	41,418	47,527
Haddocks . . . . .	271,269	298,722
Whittings . . . . .	51,527	95,711
Conger Eels . . . . .	15,555	6,489
Gurnards . . . . .	7,173	7,347
Catfish . . . . .	11,210	12,128
Monks . . . . .	6,702	8,870
Hake . . . . .	3,471	3,784
Squids . . . . .	40	49
Turbot . . . . .	1,423	2,143
Halibut . . . . .	4,905	13,416
Lemon Soles . . . . .	8,420	19,807
Flounders . . . . .	3,186	4,185
Plaice . . . . .	43,169	43,890
Brill . . . . .	34	45
Dabs . . . . .	8,618	11,927
Whitches and Megrims . . . . .	4,645	5,484
Skates and Rays . . . . .	38,753	50,670
Unclassified kinds . . . . .	10,089	8,279
Total . . . . .	1,631,139	1,487,374

APPENDIX D.—No. I.

FISH CURED.—RETURN showing the Quantity of each Species of Fish Cured, and the Mode of Cure, in the Year 1917.

No.	DISTRICTS.	HERRINGS.					
		Barrels Guttled.	Barrels Un-guttled.	Barrels Kip-pered.	Barrels of Bloat-ers or Reds.	Barrels Tinned.	Total Number of Barrels.
<b>EAST COAST.</b>							
1	Eyemouth . . . . .	1,656	520	36,477	2,540	5,532	46,725
2	Leith . . . . .	45	..	4,968	1,200	..	6,213
3	Anstruther . . . . .	..	..	20	..	..	20
4	Montrose . . . . .	..	..	..	..	391	391
5	Stonehaven . . . . .	..	..	..	..	..	..
6	Aberdeen . . . . .	..	..	29,019	8,352	4,343	41,714
7	Peterhead . . . . .	11,740	497	31,832	60	1,160	45,289
8	Fraserburgh . . . . .	47,040	5,460	20,916	220	5,625	79,261
9	Banff . . . . .	61	..	1,883	..	..	1,944
10	Buckie . . . . .	877	..	3,999	90	..	4,966
11	Findhorn . . . . .	30	..	..	..	..	30
12	Cromarty . . . . .	..	..	..	..	..	..
13	Helmsdale . . . . .	32	..	..	..	..	32
14	Lybster . . . . .	130	..	..	..	..	130.
15	Wick . . . . .	375	..	1,086	..	..	1,461
East Coast Totals carried } down . . . . .		61,986	6,477	130,200	12,462	17,051	228,176
<b>Orkney and Shetland.</b>							
16	Orkney . . . . .	..	..	..	..	..	..
17	Shetland . . . . .	27,662	2,669	8,654	65	..	39,050
Orkney and Shetland } Totals carried down . . . . .		27,662	2,669	8,654	65	..	39,050
<b>WEST COAST.</b>							
18	Stornoway . . . . .	88,480	15,134	25,178	50	..	128,842
19	Barra . . . . .	4,674	246	..	..	..	4,920
20	Loch Broom . . . . .	5,079	449	..	..	..	5,528
21	Loch Carron and Skye . . . . .	3,911	201	1,335	..	..	5,447
22	Fort-William . . . . .	705	184	11,981	..	..	12,870
23	Campbeltown . . . . .	84	..	438	..	..	522
24	Inveraray . . . . .	..	..	..	..	..	..
25	Rothesay . . . . .	..	..	..	..	..	..
26	Greenock . . . . .	500	..	9,081	604	..	10,185
27	Ballantrae . . . . .	..	..	161	..	..	161
West Coast Totals carried } down . . . . .		103,433	16,214	48,174	654	..	168,475
<b>Totals brought down.</b>							
East Coast . . . . .		61,986	6,477	130,200	12,462	17,051	228,176
Orkney and Shetland . . . . .		27,662	2,669	8,654	65	..	39,050
West Coast . . . . .		103,433	16,214	48,174	654	..	168,475
Grand Totals for 1917 . . . . .		193,081	25,360	187,028	13,181	17,051	435,701
Grand Totals for 1916 . . . . .		343,582	30,612	156,513	6,417	22,632	559,756
Increase in 1917 . . . . .		..	..	30,515	6,764	..	..
Decrease in 1917 . . . . .		150,501	5,252	..	..	5,581	124,055

Note 1.—No vessel was fitted out for curing at sea during the year.

2.—The above figures represent the quantities pickled "bungpacked," i.e. as finally packed. The corresponding equivalents in the "seastick" state, i.e. before the herrings have "pined" or settled down in the barrels, will be found in Appendix D.—No II.

3.—In addition to the above, 10,341 barrels of Norwegian herrings were converted into reds, 53 into bloaters, and 64 into kippers, practically all on the East Coast.

APPENDIX D.—No. I.—*continued.*

FISH CURED.—RETURN showing the Quantity of each Species of Fish Cured, and the Mode of Cure, in the year 1917.

SPECIES OTHER THAN HERRINGS.						
Description of Fish.	Dried.	Smoked.	Pickled.	Tinned	Total 1917.	Total 1916.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Mackerel . . . . .	..	400	2,196	95	2,691	4,683
Cod and Codling	913	1,439	..	..	2,352	26,859
Ling . . . . .	698	..	..	..	698	3,117
Tusk . . . . .	20	..	..	..	20	678
Saithe . . . . .	1,011	..	..	..	1,011	13,488
Haddocks . . . . .	122	56,120	..	5,867	62,109	73,433
Whitings . . . . .	74	4,188	..	..	4,262	5,760
Conger Eels . . . . .	60	..	..	..	60	..
Catfish . . . . .	..	..	..	..	..	792
Total . . . . .	2,898	62,147	2,196	5,962	73,203	128,810

NOTE.—1. In addition to the above there were dried in Scotland 46,084 cwts. of cod, 2850 cwts. of ling, 3030 cwts. of tusk, 10,410 cwts. of saithe, and 515 cwts. of haddocks imported wet-salted, and there were smoked 500 cwts. of cod and codling imported fresh—a further total of 63,389 cwts.

2. The figures given above represent the weight after cure.

APPENDIX D.—No. II.

HERRINGS CURED.—STATEMENT showing the Numbers of \*Barrels of Herrings Cured, Gutted and Ungutted, on the East and West Coasts of Scotland, for the Hundred and seven years ended 31st December 1917.

Year ended	East Coast (with Orkney and Shetland).			West Coast.			GRAND TOTAL.
	Gutted.	Ungutted, Kippered, &c.		Gutted.	Ungutted, Kippered, &c.		
		Total.	Total.		Total.	Total.	
6th April 1811	2,008½	6,630	8,638½	62,186	19,110	81,296	89,984½
" 1812	4,325½	10,332	14,657½	65,922	24,518	90,440	105,097½
" 1813	9,179	20,950½	30,129½	76,561½	31,025½	107,587½	137,716½
" 1814	9,503	46,800½	56,303½	37,969	5,773	43,742	100,045½
" 1815	24,314	36,827	61,141	76,021½	7,756	83,777½	144,918½
" 1816	55,411½	18,416½	73,828	73,292½	2,578½	75,870½	149,698½
" 1817	90,710½	26,252½	116,963	60,581½	3,233½	63,815	180,778
" 1818	118,594½	8,287½	126,882	76,765	4,491½	81,256½	208,138½
" 1819	221,959½	22,158	244,117½	75,197½	6,441	81,638½	325,756
" 1820	267,556½	27,391½	294,948	72,629½	4,512	77,141½	372,089½
" 1821	318,473½	23,909½	342,382½	88,626½	2,613	91,239½	433,622½
" 1822	229,070	12,808½	241,878½	56,342½	1,328	57,670½	299,549½
" 1823	183,687	15,256½	198,943½	34,211	245½	34,456½	233,398½
" 1824	272,340½	32,402	304,742½	52,792	802½	53,594½	358,336½
" 1825	227,667	28,849½	256,516½	64,623	593	65,216	321,732½
" 1826	289,101	31,703½	320,804½	42,602	121	42,723	363,527½
" 1827	211,042½	22,241½	233,284½	43,231	117	43,348	276,632½
" 1828	287,906½	37,882½	325,789	45,632	2,039½	47,671½	373,460½
" 1829	249,365½	41,047½	290,412½	47,525	945	48,470	338,882½
" 1830	216,427½	35,226	251,653½	59,494	639	60,133	311,786½
" 1831	315,479	51,609½	367,088½	46,631	855	47,486	414,574½
" 5th April 1832	259,197½	36,183½	295,381	49,216½	3,167	52,383½	347,764½
" 1833	267,928½	45,564½	313,493½	77,144	573	77,717	391,210½

\* The figures in this table, so far as relating to pickled herrings, gutted or ungutted, represent the numbers of barrels of "sea-sticks."  
 Vide Note 2 to Appendix D.—No. I. (p. 75).

*Appendices to Thirty-sixth Annual Report*

APPENDIX D.—No. II.—*continued.*

Year ended	East Coast (with Orkney and Shetland).			West Coast.			GRAND TOTAL.
	Gutted.	Ungutted, Kipperred, &c.	Total.	Gutted.	Ungutted, Kipperred, &c.	Total.	
5th April 1834	315,159	56,374 <sup>2</sup> / <sub>4</sub>	371,533 <sup>2</sup> / <sub>4</sub>	64,427 <sup>2</sup> / <sub>4</sub>	137	64,564 <sup>2</sup> / <sub>4</sub>	436,098 <sup>1</sup> / <sub>4</sub>
" " 1835	166,539 <sup>1</sup> / <sub>2</sub>	33,339 <sup>1</sup> / <sub>2</sub>	199,879	45,091 <sup>1</sup> / <sub>2</sub>	633	45,724 <sup>1</sup> / <sub>2</sub>	245,603 <sup>1</sup> / <sub>2</sub>
" " 1836	343,693 <sup>1</sup> / <sub>2</sub>	68,891 <sup>1</sup> / <sub>2</sub>	412,585 <sup>1</sup> / <sub>2</sub>	46,555 <sup>1</sup> / <sub>2</sub>	479	47,033 <sup>1</sup> / <sub>2</sub>	459,618 <sup>1</sup> / <sub>2</sub>
" " 1837	229,371	71,449 <sup>1</sup> / <sub>2</sub>	300,820 <sup>1</sup> / <sub>2</sub>	54,859	1,892 <sup>1</sup> / <sub>2</sub>	56,751 <sup>1</sup> / <sub>2</sub>	357,571 <sup>1</sup> / <sub>2</sub>
" " 1838	307,625	82,634 <sup>2</sup> / <sub>4</sub>	390,259 <sup>2</sup> / <sub>4</sub>	68,990 <sup>2</sup> / <sub>4</sub>	2,374 <sup>2</sup> / <sub>4</sub>	71,365	461,624 <sup>2</sup> / <sub>4</sub>
" " 1839	308,581	119,489 <sup>2</sup> / <sub>4</sub>	428,070 <sup>2</sup> / <sub>4</sub>	66,046 <sup>2</sup> / <sub>4</sub>	1,672 <sup>2</sup> / <sub>4</sub>	67,719	495,789 <sup>2</sup> / <sub>4</sub>
" " 1840	345,074 <sup>1</sup> / <sub>2</sub>	103,160	448,234 <sup>1</sup> / <sub>2</sub>	54,208 <sup>1</sup> / <sub>2</sub>	343	54,551 <sup>1</sup> / <sub>2</sub>	502,786
" " 1841	334,539	78,225 <sup>1</sup> / <sub>2</sub>	412,764 <sup>1</sup> / <sub>2</sub>	87,562 <sup>1</sup> / <sub>2</sub>	3,402 <sup>1</sup> / <sub>2</sub>	90,965	503,729 <sup>1</sup> / <sub>2</sub>
" " 1842	404,502 <sup>1</sup> / <sub>2</sub>	116,675 <sup>2</sup> / <sub>4</sub>	521,178	78,755 <sup>2</sup> / <sub>4</sub>	2,183 <sup>2</sup> / <sub>4</sub>	80,939	602,117
" " 1843	376,374	118,755 <sup>2</sup> / <sub>4</sub>	495,129 <sup>2</sup> / <sub>4</sub>	61,568 <sup>2</sup> / <sub>4</sub>	1,627	63,195 <sup>2</sup> / <sub>4</sub>	558,325 <sup>2</sup> / <sub>4</sub>
" " 1844	384,729	105,927 <sup>1</sup> / <sub>2</sub>	490,656 <sup>1</sup> / <sub>2</sub>	81,643	4,776	86,419	577,075 <sup>1</sup> / <sub>2</sub>
5th January 1845	305,461 <sup>1</sup> / <sub>2</sub>	72,649 <sup>1</sup> / <sub>2</sub>	378,110 <sup>1</sup> / <sub>2</sub>	80,836	901	81,737	459,847 <sup>1</sup> / <sub>2</sub>
" " 1846	343,927	82,607 <sup>2</sup> / <sub>4</sub>	426,534 <sup>2</sup> / <sub>4</sub>	64,056	3,753 <sup>1</sup> / <sub>2</sub>	67,809 <sup>1</sup> / <sub>2</sub>	494,344
" " 1847	343,009 <sup>2</sup> / <sub>4</sub>	137,296 <sup>2</sup> / <sub>4</sub>	480,306 <sup>2</sup> / <sub>4</sub>	67,613	11,263	78,876	559,182 <sup>2</sup> / <sub>4</sub>
" " 1848	323,471 <sup>1</sup> / <sub>2</sub>	135,479	458,950 <sup>1</sup> / <sub>2</sub>	46,636 <sup>1</sup> / <sub>2</sub>	9,570	56,206 <sup>1</sup> / <sub>2</sub>	515,157
" " 1849	337,450	155,654 <sup>1</sup> / <sub>2</sub>	493,104 <sup>1</sup> / <sub>2</sub>	52,473	6,981	59,454	552,558 <sup>1</sup> / <sub>2</sub>
" " 1850	427,138	152,530	579,668	77,171 <sup>1</sup> / <sub>2</sub>	25,029 <sup>2</sup> / <sub>4</sub>	102,201 <sup>1</sup> / <sub>2</sub>	681,869 <sup>1</sup> / <sub>2</sub>
" " 1851	320,493	129,532 <sup>2</sup> / <sub>4</sub>	450,025 <sup>2</sup> / <sub>4</sub>	57,694	21,134	78,828	528,853 <sup>2</sup> / <sub>4</sub>
" " 1852	348,573	109,933	458,506	68,660 <sup>1</sup> / <sub>2</sub>	36,220 <sup>2</sup> / <sub>4</sub>	104,881	563,387
31st December 1852	331,055 <sup>1</sup> / <sub>2</sub>	89,355	420,410 <sup>1</sup> / <sub>2</sub>	44,623 <sup>1</sup> / <sub>2</sub>	13,903	58,526 <sup>1</sup> / <sub>2</sub>	478,937
" " 1853	482,017	165,459 <sup>1</sup> / <sub>2</sub>	647,476 <sup>1</sup> / <sub>2</sub>	78,350	28,431 <sup>1</sup> / <sub>2</sub>	106,781 <sup>1</sup> / <sub>2</sub>	754,257 <sup>1</sup> / <sub>2</sub>
" " 1854	410,332	132,977 <sup>1</sup> / <sub>2</sub>	543,309 <sup>1</sup> / <sub>2</sub>	48,247 <sup>1</sup> / <sub>2</sub>	31,207 <sup>1</sup> / <sub>2</sub>	79,455	622,764 <sup>1</sup> / <sub>2</sub>
" " 1855	505,481 <sup>2</sup> / <sub>4</sub>	136,687 <sup>2</sup> / <sub>4</sub>	642,169 <sup>2</sup> / <sub>4</sub>	77,175 <sup>2</sup> / <sub>4</sub>	32,631	109,806 <sup>2</sup> / <sub>4</sub>	751,975 <sup>2</sup> / <sub>4</sub>
" " 1856	396,650	92,400 <sup>2</sup> / <sub>4</sub>	489,050 <sup>2</sup> / <sub>4</sub>	69,755 <sup>2</sup> / <sub>4</sub>	32,492 <sup>1</sup> / <sub>2</sub>	102,248	591,298 <sup>2</sup> / <sub>4</sub>
" " 1857	390,775	59,712 <sup>1</sup> / <sub>2</sub>	450,487 <sup>1</sup> / <sub>2</sub>	74,447 <sup>1</sup> / <sub>2</sub>	25,763 <sup>1</sup> / <sub>2</sub>	100,211	550,698 <sup>1</sup> / <sub>2</sub>
" " 1858	410,524 <sup>2</sup> / <sub>4</sub>	111,440 <sup>2</sup> / <sub>4</sub>	521,965 <sup>2</sup> / <sub>4</sub>	59,868 <sup>1</sup> / <sub>2</sub>	23,350	83,218 <sup>1</sup> / <sub>2</sub>	605,184
" " 1859	308,518 <sup>1</sup> / <sub>2</sub>	55,584	364,102 <sup>1</sup> / <sub>2</sub>	72,541	20,487	93,028	457,130 <sup>1</sup> / <sub>2</sub>



Year ended	East Coast (with Orkney and Shetland).			West Coast.			GRAND TOTAL.
	Gutted.	Ungutted, Kipped, &c.	Total.	Gutted.	Ungutted, Kipped, &c.	Total.	
31st December 1860	424,201½	103,086¼	527,287¾	71,894	37,891½	109,785½	637,073¼
1861	447,931½	97,207	545,138½	71,241½	34,336½	105,578	650,716½
1862	536,602½	88,911	625,513½	119,257½	52,685	171,942½	797,456
1863	445,596½	75,511¼	521,108½	61,396½	26,810	88,206½	609,314¼
1864	378,752	88,107¼	466,859¼	99,737½	42,889	142,626½	609,486¼
1865	374,424	73,814½	448,238½	95,920½	57,207	153,127½	601,366
1866	398,358	72,420½	470,778½	99,396½	74,431	173,827½	644,605¼
1867	492,172½	81,978½	574,150¾	139,547¼	90,392	229,939¼	804,090
1868	363,922½	62,906	426,828½	81,546	129,886¼	211,432¼	638,260¾
1869	395,500½	61,809¾	457,310¼	93,330½	124,502¼	217,832¾	675,143
1870	508,805½	98,318	607,123¾	148,294	77,783	226,037	833,160½
1871	585,172	94,178	679,350	83,317½	62,808¼	146,125¼	825,475¼
1872	623,443½	62,341	685,784½	48,260	39,815	88,075	773,859½
1873	710,376½	96,983½	807,360	86,525½	45,348	131,873½	939,233½
1874	789,345½	77,489¼	866,835¼	97,657	36,068¾	133,725¼	1,000,561
1875	774,293½	67,729	842,022½	60,529	40,428½	100,957½	942,980
1876	454,164	59,230	513,394	32,074½	52,729	84,803½	598,197½
1877	618,116¾	65,529¼	683,646	98,754½	65,318¼	164,072¼	847,718
1878	702,433½	70,927½	773,361	69,122½	63,284¼	132,407	905,768
1879	563,754	62,833½	626,587½	92,237	122,971½	215,208½	841,796
1880	1,096,953¼	104,151½	1,201,105	127,245	145,250¼	272,495¼	1,473,600¼
1881	830,751½	73,602¼	904,353¾	84,346½	122,455	206,801¾	1,111,155¼
1882	879,243¾	98,983	978,226½	101,512	203,235	304,747	1,282,973½
1883	960,428½	87,477¼	1,047,905¾	127,658½	148,848¼	221,506¾	1,269,412½
1884	1,323,989½	132,061½	1,456,050¾	78,223¾	112,803	241,026¾	1,697,077¾
1885	1,244,259	74,723½	1,318,982½	108,190	145,779¾	253,969¾	1,572,952½
1886	1,017,152	125,287¾	1,142,439¾	76,211	93,572½	169,783½	1,312,223¼
1887	962,116	127,588	1,089,704	101,937¾	111,782½	213,720¼	1,303,424¼
1888	790,458	82,155¼	872,613¼	116,542	129,717	246,259	1,118,872¼

## APPENDIX D.—No. II.—continued.

Year ended	East Coast (with Orkney and Shetland).			West Coast.			GRAND TOTAL.
	Gutted.	Ungutted, Kipped, &c.	Total.	Gutted.	Ungutted, Kipped, &c.	Total.	
31st December 1889	1,071,686	112,171	1,183,857	105,417	108,233	213,650	1,397,507
" 1890	1,042,089	81,218½	1,123,307½	142,340½	38,955	181,295½	1,304,603
" 1891	797,219	61,427	858,646	208,024	59,402	267,426	1,126,072
" 1892	1,012,452	82,267	1,094,719	125,299	37,924	163,223	1,257,942
" 1893	1,177,365	110,236	1,287,601	90,977	30,960¼	121,937¼	1,409,538¼
" 1894	1,312,926	98,783	1,411,709	91,489	14,879	106,368	1,518,077
" 1895	1,314,225	79,695	1,393,920	114,902	19,312	134,214	1,528,134
" 1896	1,232,549	101,098	1,333,647	132,234	26,035	158,269	1,491,916
" 1897	732,454	72,457	804,911	143,319	41,212	184,531	989,442
" 1898	1,500,533	92,883½	1,593,416½	174,743	37,188	211,931	1,805,347
" 1899	912,841	71,512	984,353	154,768	36,534	191,302	1,175,655
" 1900	968,077	98,673	1,066,750	156,522	32,333	188,855	1,255,605
" 1901	1,334,010	118,173	1,452,183	109,056	44,646	153,702	1,605,885
" 1902	1,507,138	125,933	1,633,071	123,437	46,651	170,088	1,803,159
" 1903	1,331,664	138,949	1,470,613	105,654	42,543	148,197	1,618,810
" 1904	1,737,345	170,510	1,907,855	102,548	52,571	155,119	2,062,974
" 1905	1,766,734	164,098	1,930,832	112,156	68,613	180,769	2,111,601
" 1906	1,679,947	166,011	1,845,958	116,343	35,561	151,904	1,997,862
" 1907	2,181,017	189,892	2,370,909	147,945	59,414	207,359	2,578,268
" 1908	1,787,835	183,495	1,971,330	163,931	64,808	228,739	2,200,069
" 1909	1,507,914	180,740	1,688,654	148,410	53,201	201,611	1,890,265
" 1910	1,934,320	211,236	2,145,556	145,628	37,690	183,318	2,328,874
" 1911	1,667,432	207,335	1,874,767	139,272	32,708	171,980	2,046,747
" 1912	1,660,972	178,116	1,839,088	148,414	34,945	183,359	2,022,447
" 1913	1,407,323	172,591	1,579,914	253,804	52,878	306,682	1,886,596
" 1914	1,176,361	185,854	1,362,215	185,925	66,387	252,312	1,614,527
" 1915	28,597	61,502	90,099	44,852	40,518	85,370	175,469
" 1916	322,398	149,043	471,441	89,709	72,847	162,556	633,997
" 1917	109,976	178,770	288,746	120,743	67,566	188,309	477,055

APPENDIX E.—No. II.

FISH EXPORTED.—RETURN showing the Total Quantity of Fish Exported to England, Ireland, the Continent, and Places out of Europe during the Year 1917.

I.—HERRINGS.						
DESCRIPTION OF FISH.	WHERE SENT.					
	Eng-land.	Ire-land.	The Continent.	Places out of Europe.	Total 1917.	Total 1916.
SCOTTISH CURED HERRINGS.	Barrels.	Barrels.	Barrels.	Barrels.	Barrels.	Barrels.
Branded . . . . .	..	..	..	..	..	..
Unbranded . . . . .	17,944	17,692	61,539	16,109	113,284	366,682
Total Number of Barrels of Cured Herrings exported	17,944	17,692	61,539	16,109	113,284	366,682
Herrings Sprinkled or Iced	..	..	..	..	..	..
Grand Totals for 1917 . . . . .	17,944	17,692	61,539	16,109	113,284	..
Grand Totals for 1916 . . . . .	6,490	1,192	312,719	46,281	..	366,682
Increase in 1917 . . . . .	11,454	16,500	..	..	..	..
Decrease in 1918 . . . . .	..	..	251,180	30,172	253,398	..

II.—KINDS OTHER THAN HERRINGS.						
Cod, Ling, &c., dried, cwts.	2,939	9,369	31,673	286	44,267	54,017
Do. pickled, brls.	..	..	..	..	..	44
Mackerel, " "	69	..	..	1,685	1,754	961

NOTE.—In addition to the above, there were exported, *via* Montrose District, 163 barrels of Irish and 5,900 of Icelandic herrings to the Continent; and *via* Glasgow, 2,851 barrels of Irish, and 325 of Icelandic herrings to America, 10 barrels of Icelandic to England, and 250 to Ireland; and 8,046 cwts. of preserved fish (principally dried cod and tinned herrings), 224 cwts. to America, 1,018 to Australia, 6,196 to England, and 608 to Ireland.

## APPENDIX F.—

PERSONS EMPLOYED.—RETURN showing the Total Number of branches of the Sea Fisheries

No.	DISTRICTS.	Fishermen and Boys (resident and non-resident).	Fishmongers.	Hawkers of Herring and other Fish.	Fishcurers.	Coopers.	Gutters and Packers.	Clerks.	Carters and Labourers.	Persons gathering Bait and Baiting Lines.
<b>EAST COAST.</b>										
1	Eyemouth . . . . .	275	1	7	15	25	272	1	31	30
2	Leith . . . . .	1,042	586	103	10	22	120	36	30	40
3	Anstruther . . . . .	703	17	24	24	13	40	1	3	207
4	Montrose . . . . .	588	150	110	44	13	12	12	62	450
5	Stonehaven . . . . .	146	4	35	6	2	22	3	8	58
6	Aberdeen . . . . .	1,213	248	249	160	40	1,036	318	1,864	50
7	Peterhead . . . . .	576	9	35	54	93	725	18	176	114
8	Fraserburgh . . . . .	906	1	6	75	134	919	16	173	25
9	Banff . . . . .	575	1	42	19	7	126	1	25	58
10	Buckie . . . . .	1,358	2	30	11	17	120	12	4	..
11	Findhorn . . . . .	455	16	80	20	6	72	4	30	20
12	Cromarty . . . . .	210	..	20	4	..	..	..	3	5
13	Helmsdale . . . . .	190	..	10	9	..	..	2	6	32
14	Lybster . . . . .	66	..	2	1	1	3	..	2	..
15	Wick . . . . .	397	12	30	30	44	72	10	88	20
East Coast Totals carried down . . . . .		8,700	1,047	783	482	417	3,539	434	2,505	1,109
<b>Orkney and Shetland.</b>										
16	Orkney . . . . .	975	4	..	3	1	..	..	2	..
17	Shetland . . . . .	1,411	4	3	26	94	629	19	62	54
Orkney and Shetland Totals carried down . . . . .		2,386	8	3	29	95	629	19	64	54
<b>WEST COAST.</b>										
18	Stornoway . . . . .	788	15	40	16	39	720	12	90	..
19	Barra . . . . .	359	..	..	7	1	111	2	20	..
20	Loch Broom . . . . .	351	3	9	7	1	86	1	18	15
21	Loch Carron and Skye . . . . .	545	..	..	23	15	60	3	18	150
22	Fort-William . . . . .	340	6	11	6	2	12	2	..	40
23	Campbeltown . . . . .	382	4	10	16	1	14	..	10	15
24	Inveraray . . . . .	358	4	7	8	..	..	..	4	..
25	Rothesay . . . . .	104	23	16	5	..	..	..	4	..
26	Greenock . . . . .	168	652	890	25	14	74	100	163	28
27	Ballantrae . . . . .	319	50	70	6	..	..	8	58	..
West Coast Totals carried down . . . . .		3,714	757	1,053	119	73	1,077	128	385	248
<b>Totals brought down.</b>										
East Coast . . . . .		8,700	1,047	783	482	417	3,539	434	2,505	1,109
Orkney and Shetland . . . . .		2,386	8	3	29	95	629	19	64	54
West Coast . . . . .		3,714	757	1,053	119	73	1,077	128	385	248
Grand Totals for 1917 . . . . .		14,800	1,812	1,839	630	585	5,245	581	2,954	1,411
Grand Totals for 1916 . . . . .		14,392	1,838	1,949	566	545	5,189	577	3,020	1,322
Increase in 1917 . . . . .		408	..	..	64	40	56	4	..	89
Decrease in 1917 . . . . .		..	26	110	..	..	..	..	66	..

No. I.

Persons employed in each District in connection with the various during the Year 1917.

Boxmakers.	Boat Builders.	Basketmakers.	Persons making and mending Nets.	Persons manufacturing Barrel Staves.	Persons employed on board Vessels Curing, Exporting, and Carrying Herrings and other Fish.		Persons employed on board Vessels Importing Salt, Stave Wood, and Hoops.		Other Occupations.	Total Persons employed.	DISTRICTS.
					British.	Foreign.	British.	Foreign.			
..	8	..	17	..	..	..	..	..	..	682	<b>EAST COAST.</b>
30	50	7	400	10	69	80	10	12	75	2,732	Eyemouth.
..	15	..	202	4	..	..	..	..	..	1,253	Leith.
4	23	5	24	4	..	..	..	..	23	1,524	Anstruther.
..	3	..	10	..	..	..	..	..	..	297	Montrose.
114	1,700	11	196	32	41	76	18	32	..	7,398	Stonehaven.
10	28	..	65	8	36	..	..	20	..	1,967	Aberdeen.
10	22	1	10	2	58	10	22	30	12	2,432	Peterhead.
2	51	..	..	..	..	..	..	..	3	910	Fraserburgh.
..	17	..	20	..	..	..	..	..	..	1,591	Banff.
..	12	..	40	..	..	..	..	..	..	755	Buckie.
..	2	..	..	..	..	..	..	..	..	244	Findhorn.
..	..	..	..	..	..	..	..	..	..	249	Cromarty.
..	1	..	..	..	..	..	..	..	..	76	Helmsdale.
..	10	..	10	..	..	..	..	..	..	723	Lybster.
..	..	..	..	..	..	..	..	..	..	..	Wick.
170	1,942	24	994	60	204	166	50	94	113	22,833	East Coast Totals carried down.
..	16	..	..	..	..	..	..	..	..	1,011	<b>Orkney and Shetland.</b>
..	14	..	30	4	146	..	115	4	18	2,633	Orkney.
..	..	..	..	..	..	..	..	..	..	..	Shetland.
..	30	..	30	4	146	..	115	4	18	3,634	Orkney and Shetland Totals carried down.
..	19	..	50	..	468	..	91	..	7	2,355	<b>WEST COAST.</b>
..	8	..	3	..	22	..	14	..	..	536	Stornoway.
..	20	..	..	..	63	..	..	..	..	565	Barra.
..	2	..	..	..	220	..	..	..	..	1,054	Loch Broom.
..	4	..	10	..	70	..	..	..	..	491	Loch Carron and Skye
..	8	..	4	..	52	..	..	..	..	518	Fort-William.
..	9	..	..	..	31	..	..	..	..	424	Campbeltown.
8	5	..	250	..	22	..	..	..	..	183	Inveraray.
..	14	..	..	..	215	..	10	..	26	2,628	Rothesay.
..	..	..	..	..	..	..	..	..	..	525	Greenock.
8	89	..	317	..	1,163	..	115	..	33	9,279	Ballantrae.
..	..	..	..	..	..	..	..	..	..	..	West Coast Totals carried down.
170	1,942	24	994	60	204	166	50	94	113	22,833	<b>Totals brought down.</b>
..	30	..	30	4	146	..	115	4	18	3,634	East Coast.
8	89	..	317	..	1,163	..	115	..	33	9,279	Orkney and Shetland.
178	2,061	24	1,341	64	1,513	166	280	98	164	35,746	West Coast.
180	2,060	43	1,482	72	2,181	949	315	141	188	37,009	Grand Totals for 1917.
..	1	..	..	..	..	..	..	..	..	..	Grand Totals for 1916.
2	..	19	141	8	668	783	35	43	24	1,263	Increase in 1917.
..	..	..	..	..	..	..	..	..	..	..	Decrease in 1917.



APPENDIX I.—No. II.

RETURN of the PIERS and HARBOURS Erected or Improved by the FISHERY BOARD FOR SCOTLAND from 1st January 1883 to 31st December 1917, showing for each undertaking the CONTRIBUTION made by the Board.

County.	Pier or Harbour.	Contributions by the Board.			County.	Pier or Harbour.	Contributions by the Board.		
		£	s.	d.			£	s.	d.
					Brought forward	73,237	17	0	
Aberdeen	*Roseheart	3,881	10	11	Fife	St. Monance	5,839	18	1
	Pennan	1,320	13	4		Pittenweem	4,450	0	0
	Collieston	5,482	0	7		St. Andrews	5,670	2	1
	Sandhaven	738	10	9		Cellardyke	1,300	0	0
	Fraserburgh	5,000	0	0	Forfar	Auchmithie	4,125	0	0
Argyll	Carsaig, Mull	5	17	0	Haddington	Port Seton	180	0	0
	Waterfoot,				Inverness	Broadford,			
	Cantyre	24	0	0		Skye	7,875	0	0
Ayr	Dunure	512	6	8	Kincardine	Stonehaven	2,900	0	0
	Ballantrae	105	0	0	Northum-	Greenshaven	319	16	1
	Maidens	1,181	19	6	berland	Craster	1,000	0	0
Banff	Crovie	971	16	3	Nairn	Nairn	5,587	10	0
	*Findochty	9,331	8	9	Orkney and	Holm, Ork-			
	Buckpool	1,474	18	11	Shetland	ney	1,102	0	10
	Buckie					Whitehall,			
	(Cluny)	15,000	0	0		Stronsay	3,000	0	0
	Portknockie	6,993	16	0	Ross and	Balintore	5,805	13	0
	†Whitehills	9,087	1	2	Cromarty	Rockfield	10	0	0
	Sandend	432	18	4		Ness, Lewis	8,072	6	7
	Cullen	2,400	0	0		Cromarty	300	0	0
	†Banff	2,293	18	10		Avoch	1,900	0	0
	Macduff	3,000	0	0	Sutherland	Portnacou.	900	0	0
Berwick	Coldingham	3,000	0	0					
Elgin	Lossiemouth	1,000	0	0					
	Carried forward	73,237	17	0			133,575	3	8

\* These harbours were begun by the old Board, but the whole of the payments made towards the works are now given.

† The grants to these harbours have not yet been wholly expended.

APPENDIX I.—No. III.

BRAND FEES.—ACCOUNT OF THE BRAND FEE REVENUE, THE COST OF COLLECTION, THE SURPLUS, AND THE EXPENDITURE, during the period from 1881 to 1917-18.

1. Year of Collection.	2. Total Proceeds of Brand Fees.	3. Estimated Cost of Collection.*	4. Surplus or Deficit	5. Year in which Surplus Voted.	6. Amount Voted.	How Amount Voted disposed of.											
						7. For Telegraph Guarantees.			8. For Scientific Investigation.			9. For Eyemouth Harbour Loan Guarantee.			10. Transferred to General Harbour Fund.†		
						£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
10 Years } ++ 1881-90 }	83,245	56,647	26,598	1882-92	26,860	9,710	14	1	768	1	4	1,824	0	0	14,557	4	7
10 Years }    1891-1900 }	65,760	49,650	16,110	1892-1902	18,398	3,238	12	3	..	..	..	2,895	6	11	12,264	0	10
1901	6,423	5,096	1,327	1902-03	1,327	..	..	..	..	..	..	460	4	6	866	15	6
1902	7,259	5,219	2,040	1903-04	2,040	..	..	..	..	..	..	453	14	6	1,586	5	6
1903	6,067	5,181	886	1904-05	886	..	..	..	..	..	..	447	4	6	438	15	6
1904	8,070	5,443	2,627	1905-06	2,627	..	..	..	..	..	..	440	14	6	2,186	5	6
1905	6,582	5,363	1,219	1906-07	1,219	..	..	..	..	..	..	437	9	6	781	10	6
1906	5,100	5,487	387	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1907	8,928	5,277	3,651	1908-09	3,651	..	..	..	..	..	..	421	4	7	3,229	15	5
1908	7,218	5,419	1,799	1909-10	1,799	..	..	..	..	..	..	414	14	6	1,384	5	6
1909	3,857	5,376	1,519	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1910	5,246	5,467	221	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1911	4,455	5,549	1,094	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1912	2,915	5,550	2,635	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1913	4,110	5,549	1,439	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1914	1,288	5,639	4,351	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1915	Nil	5,420	5,420	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1916	Nil	5,406	5,406	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1917	Nil	5,217	5,217	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	226,523	197,955	28,568		58,807	12,949	6	4	768	1	4	7,794	13	6	37,294	18	10

\* For details see Civil Service Estimates (Class II., Vote for Fishery Board for Scotland).  
 † To be spent as required.  
 ‡ For details of these years, see 19th or previous Annual Reports.  
 § This amount was set aside in the year 1891 as a Reserve Fund only to be drawn upon in the event of the Brand Fee Surplus in any particular year being insufficient, after defraying Telegraph Guarantees, to meet the liabilities under the Loan Guarantee. In 1892-93, £235 0s. 2d. was paid from this Fund; in 1898-99, £486 4s. 6d.; in 1900-01, £473 4s. 6d.; in 1901-02, £460 14s. 6d.; and in 1906-07, the balance, amounting to £192 10s. 4d.  
 ¶ For details of these years, see 26th Annual Report.



## APPENDIX M.

### HARBOUR IMPROVEMENT SCHEMES.

REPORT BY MR. R. GORDON NICOL, M.Inst.C.E.

I have the honour to submit, for the information of the Board, the following report on the Harbour Improvement Schemes which are being carried out under the supervision of the Board, and were in progress for the year ended 31st December 1917.

The following table gives a list of these harbours, along with the estimated cost of the schemes and the assistance in grants and loans that is to be provided from funds at the disposal of the Development Commissioners and the Board.

Name of Harbour.	Estimated Cost of Scheme.	Assistance to be Provided.		
		Free Grants.	Loans.	Total.
Eyemouth . . . . .	£4,200	£1,200	£2,500	£3,700
Fraserburgh . . . . .	40,000	20,000	20,000	40,000
Gardenstown . . . . .	9,500	4,000	4,000	8,000
Macduff . . . . .	26,488	12,000	12,000	24,000
Banff . . . . .	4,000	3,000	...	3,000
Whitehills . . . . .	3,000	2,250	...	2,250
Cullen . . . . .	6,037	4,000	2,300	6,300
Portknockie . . . . .	8,000	3,200	2,800	6,000
Findochty . . . . .	6,700	2,000	1,500	3,500
Buckie . . . . .	57,750	18,000	39,750	57,750
Lossiemouth . . . . .	15,034	3,000	10,000	13,000
Nairn . . . . .	18,000	7,000	...	7,000
Wick . . . . .	31,260	...	31,260	31,260
Total . . . . .	£229,969	£79,650	£126,110	£205,760

*Eyemouth Harbour.*—Work on this Improvement Scheme, which is for deepening the entrance to Eyemouth Harbour by the removal of rock within the entrance channel, is still suspended on account of the war.

*Fraserburgh Harbour.*—Only slight progress has been made on this Improvement Scheme. Work has been chiefly confined to the formation of the roadway of Faithlie Jetty, and repairs to a few of the wave traps on the outside of Burnett Pier.

The damage which was done to the parapet of Balaclava Breakwater by the sea in the end of 1916 was repaired during the summer months.

Consideration of the application by the Harbour Commissioners to the Development Commissioners for further financial assistance has been deferred meantime, pending the submission of definite proposals for the completion of the scheme, and in this connection the Harbour Commissioners have appointed Mr. Hugh R. Barr, Assoc. M.Inst.C.E., Aberdeen, to report on the subject.

Payment of the first instalment of the loan amounting to £15,000 was made from the Development Fund.

*Gardenstown Harbour.*—Work on this Improvement Scheme was suspended in January until after the war. The extension of the East Pier is practically completed, and now affords protection to the harbour entrance.

Payment of a sum of £540 was made to the Trustees from the Development Fund.

*Macduff Harbour.*—Good progress has been made on this Improvement Scheme throughout the year. The parapet of the breakwater has been constructed for a length of 122 feet, the inner quay wall of the breakwater has been founded and built complete for a length of 400 feet, about 500 square yards of concrete roadway have been laid, 9482 cubic yards of rock have been excavated with the aid of pneumatic drilling plant and explosives, and 1344 cubic yards of soft material have been removed from the area of the new basin. The stone parapet wall of the Old North Pier adjoining the new harbour basin has also been removed.

Payment of sums amounting to £6500 by way of loan has been made to the Trustees during the year from the Development Fund.

As a considerable amount of work remains to be done before the Improvement Scheme can be completed, and the financial resources of the Trustees are almost exhausted, application has been made to the Development Commissioners for further financial assistance.

*Banff Harbour.*—Progress on this Improvement Scheme was still so very slow that the Trustees decided to determine the contract, and are now carrying out the remainder of the work departmentally under the charge of Mr. Archibald Henderson, Assoc. M.Inst.C.E., Macduff.

A settlement was made with the contractor for the amount of work done, and the plant on the site belonging to him was purchased by the Trustees for the sum of £317, 9s. 7d. to enable them to complete the scheme.

In the course of the excavation it was discovered that the rock on which the old walls are founded is of such a rotten nature where exposed that it will be necessary to face the rock with concrete, and in this connection a report is being obtained from the Engineer.

During the progress of the work it was found necessary to suspend operations for a short time to effect the release of two herring drifters which could not be launched without admitting water to the harbour basin. This was accomplished in April, and part of the cofferdam was also removed to enable the vessels to leave the port. The cost of this work was borne by the owners of the vessels.

Payments amounting to £1045, 7s. 2d. were made to the Trustees by the Board towards the cost of the scheme during the year.

*Whitehills Harbour.*—Work on this Improvement Scheme is still suspended on account of the war.

*Cullen Harbour.*—This Improvement Scheme was completed in the previous year, at a cost of £9274, 5s. 8d., towards which sums amounting in the aggregate to £5600 were contributed from the Development Fund and the funds of the Board. As the financial resources of the Trustees were inadequate, however, to meet the additional cost of the scheme which largely exceeded the estimate, the Board agreed to advance a further sum of £700 provided the Trustees carried out repairs to the breakwaters which had been damaged by storms during the progress of the works. These repairs were begun departmentally in August and are being executed as rapidly as the weather will permit.

Payments to the extent of £1600 were made to the Trustees, £1100 being by way of loan from the Development Fund and £500 free grant from the Board.

*Portknockie Harbour.*—Consideration of this scheme of Harbour Improvement is still postponed on account of the war.

*Findochty Harbour.*—This scheme is still deferred until after the war.

*Buckie Harbour.*—This Improvement Scheme is still in progress, and was sufficiently advanced to admit the water to the new basins and bring

these into use early this year. The opening ceremony was performed on 14th February by His Grace the Duke of Richmond and Gordon.

At the instance of the contractors, Messrs. Charles Brand & Son, the Town Council agreed to determine the contract with this firm and complete the work departmentally. The chief works carried out during the year included the completion of the rock excavation in the harbour basins and the deposit of the excavated material in the embankment west of the harbour, the underpinning of the quay walls with concrete, the formation of quays and roadways, and the removal of the enclosing cofferdam. The repair of the entrance breakwater, which consists in surrounding the head of the structure with steel sheet piles driven into the boulder clay, and filling the space between the piles and the breakwaters with concrete, was commenced in July and is still in progress. The pointing of the defective work in the breakwaters was continued during the year in so far as weather permitted.

Consideration of the financial position of the scheme is at present engaging the attention of the Town Council, as the cost of the works is likely to exceed considerably the estimates of September 1915, before the scheme can be completed.

Payment of the first instalment of the loan of £14,750 from the Development Fund, amounting to £8000, was made to the Council, as the Harbour Authority.

*Lossiemouth Harbour.*—Progress on this scheme has been very slow, owing chiefly to scarcity of labour. The East Pier was constructed for a length of 106 feet, and is now completed. As the action of the sea was beginning to erode the foundations of this pier, it was necessary to form a concrete apron along a considerable portion of the sea face, at foundation level. No progress was made this year in extending the breakwater at the west side of the harbour entrance, but the parapet wall of the structure was completed throughout its length. The erection of the iron footbridge, which was shifted up the river, was completed on the new site.

Payments amounting to £2557, 12s. 4d. have been made to the Harbour Commissioners during the year by way of loan from the Development Fund.

*Nairn Harbour.*—This Improvement Scheme is still under consideration by the Town Council.

*Wick Harbour.*—The special repairs which are being carried out at the harbour piers have progressed favourably during the year, although there were frequent interruptions owing to stormy weather. The apron of concrete in large bags and mass work, which extends along the sea face and north end of the pier, was completed. The underpinning of the inner wall of the North Pier was also practically completed.

Operations were about to commence for the underpinning of the south wall of the Jetty in the old harbour, when it was discovered, as the result of a survey by diver, that the wall was in worse condition than when formerly examined, and it was found necessary to modify the method of strengthening by building a new face in front of the old wall. The modified work, which has the approval of the Development Commissioners, is estimated to cost £5250, and a commencement has been made to the work. The submarine excavation for the foundation of the new wall has been begun, and a large quantity of road metal has been prepared at the quarry.

Payments amounting to £2351, 6s. have been made to the Trustees by way of loan from the Development Fund.

R. GORDON NICOL,  
*Consulting Engineer.*

## APPENDIX N.

**SALMON FISHERIES.****MR. CALDERWOOD'S REPORT.**

FISHERY BOARD FOR SCOTLAND,  
*February 1918.*

I have the honour to submit my annual report with regard to the Salmon Fisheries of Scotland in 1917.

Last season's catch showed an improvement by 458 tons on the lowest record ever yet reached, being the record for 1916, but last year's record was still 325 tons below the last quinquennial average.

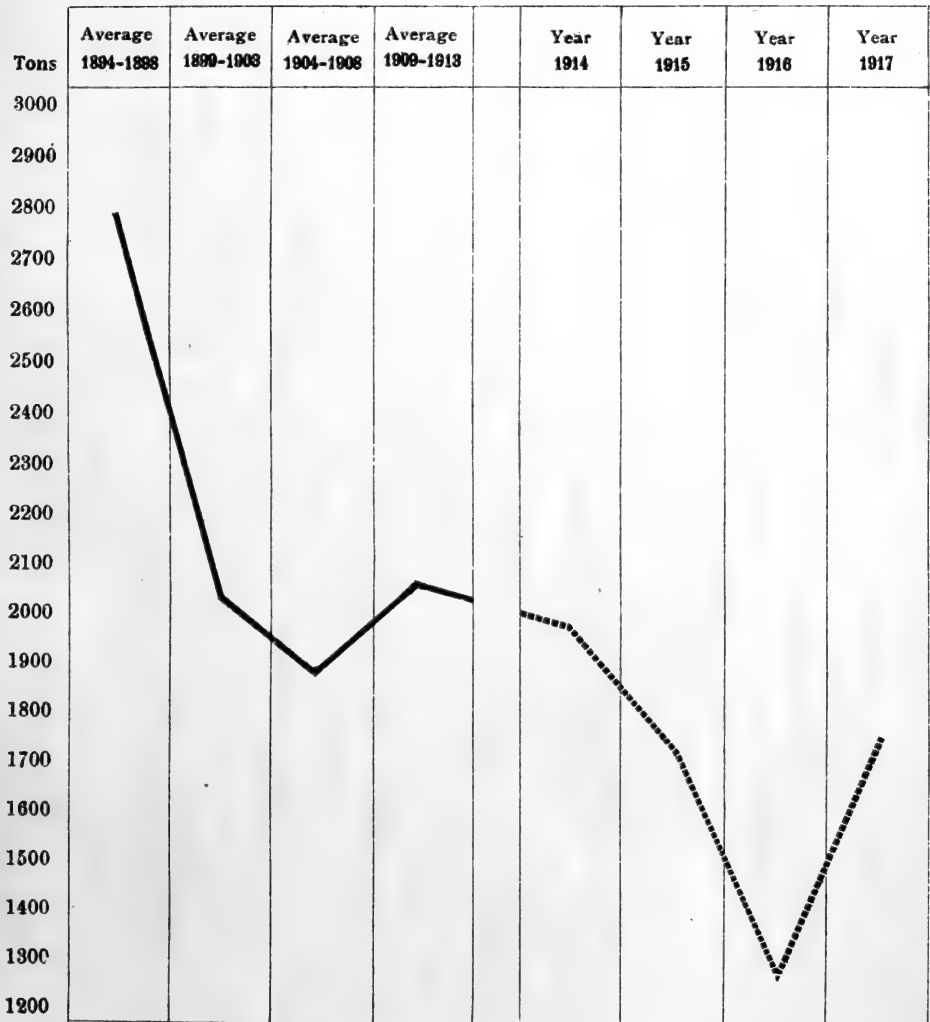
The position is shown graphically in the following curves, the first four columns being the four quinquennial averages available, and the four succeeding columns, in which the line is dotted, being the annual catch of the four last years.

In my last report I entered at some length into the general question of the decline of those fisheries; the causes which certainly have to be taken into consideration in any remedial proposals; and the very unnecessary nature of much that acts against the interests of the fisheries, more especially the injuries done by industrial enterprises of various kinds.

It does not follow that because certain industries may be of greater national importance the salmon fishery interests must therefore be surrendered. If pollutions, whether industrial or domestic, the undue abstraction of water, and one or two other minor causes could be reduced, the existing netting, heavy though it may be in places, could very probably be carried on, with a much greater amount of success in the supply of a valuable fish food, and without injury to the stock.

The manner in which salmon fisheries and polluting industries are represented as essentially opposed one to the other, is, in my opinion, most harmful. Economically, also, I believe the position to be unsound. The more scientifically any manufacturing operation is carried on, the more does waste disappear. Bye-products receive more attention, chemical properties carried off in effluents are abstracted and used, or markets are found or created for such properties. Sheer waste of matter from any manufactory should be properly regarded as money lost. Examples might be found in, say, the production of nitre cake as a waste in the manufacture of explosives, or pot ale in the manufacture of whisky, both formerly regarded as only to be got rid of, but both now completely subject to treatment; both wastes produced in very large quantities, and both extremely harmful to fish life. Further, it seems fair to ask if there is any just reason why our rivers should be the channels into which impurities are poured. No doubt it is easy to get rid of any waste by throwing it into a stream of water flowing to the sea, but if that stream of water supports a stock of fish which are valuable food, and which stock of fish cannot be kept up unless the water of the stream is kept

## CURVES SHOWING COMPARISON BETWEEN FORMER AVERAGES AND THE LAST FOUR SEASONS.





pure, it is surely wiser to convert the waste either into something useful, or at least into something harmless.

I venture to think that if this question were carefully regarded with the definite object of securing a minimum of loss to the manufacturing industries, and an adequate treatment to secure a standard of purity suitable to the conditions involved, it would be possible to do very much to stop the cancer which is eating into the heart of our salmon fisheries.

The standard of purity would necessarily vary under different conditions. A highly toxic effluent poured into the estuary of a river of large volume might involve a large outlay in order to secure a high standard of purity, but with the free mixing of a large volume of water, and the regular influx of tides, a high standard might be quite unnecessary. The converse is equally true. The practical issue comes when the standard is arrived at, and when the authority competent to decide upon the standard, and to see that it is reached, is set up. The percentage of oxygen, the solids in suspension, and the stable or instable properties of the solids, are of infinite value to the life and well-being of salmon fry, and to the food necessary for the fry, the parr, and the smolts before they depart to the sea. The question in a particular case would have to be, is existing pollution harmful, and if so, what standard of purity is necessary to secure safety to the fish without undue outlay to the polluters.

After all, the business of salmon netting all round our coasts is absolutely dependent upon the breeding of the fish in the rivers, and is an industry as deserving of consideration as many of those which at present cause pollution in the rivers.

If I may draw attention to an instance of former neglect of salmon fisheries elsewhere, I might refer to the great natural stock of salmon which existed on the eastern coast of North America in early days, to the disastrous and unregulated treatment of the rivers by the erection of lumber mills, obstructive racks, to the loading of the river beds with saw dust, so that fish could neither reach the high spawning grounds nor deposit their eggs in the lower reaches, and how the salmon fisheries died out, till, at great expense, the American Government commenced to re-establish them.

The operation in this country has been less rapid, but the increase of pollutions is insidious and none the less real. With the process of time a pollution seldom gets better any more than a weir gets less steep. Many industries are developing under the changed conditions which now obtain, and not a few examples have recently arisen where much unnecessary harm has been done to the fisheries.

In the course of my inspections in 1917, I visited several districts to which I may now make reference.

#### ANNAN.

I commenced at the eastern end of the Solway area, and first gave attention to the new conditions in which salmon fisheries are placed from the extensive manufacturing operations in the neighbourhood of Gretna. The salmon fisheries above the Viaduct have been purchased by a Government Department, and are now being fished under the former manager. Before visiting the various stake nets above the Viaduct I ascertained that the Newbie nets were doing very fairly well. Also that only some five or six boats have been whammelling from the fishery leased by the Office of Woods to the Annan Fishermen's Association. The latter fishery may now be regarded as the nucleus of the openly practised whammelling,

drift netting, or "fleeting" in the district. The local poke nets are fished as fully as formerly, there being keen competition to secure the licenses issued by the Burgh of Annan. Some 250 clouts (four pockets to a clout) are fished to the west, and 250 to the east of the Viaduct. Those to the west are let at 7s. 6d., and those to the east at 6s. 6d., the resulting revenue being £175.

By walking along the shore from Dornock to Browhouses, near Gretna, I was able to see the various effluents coming from the works. There are some eight or ten comparatively small effluents, some of which also contain sewage, while at the upper or eastern end an 18-inch pipe carries off the large amount of domestic sewage from the Gretna Settlement. Of the effluents containing waste products from the works, those at the western or Dornock end are certainly the worst, being not only the most extensive but the most impure. A very small outflow occurs about the centre of the shore line referred to, which is so acid that a warning against touching it is erected. Another quite small channel was, at the time of my visit, quite dry, while a neighbouring and larger channel was an untouched burn or natural land drainage outflow.

That the discharge of the waste products should be through a number of channels distributed along the shore line is on the whole an advantage, since there is no great concentration of toxic fluids which could seriously affect the shore and the salmon nets. I saw all the outflows at low tide, and although at two, near the western end, considerable impurity and fungus growth were obvious enough, the effluents disappeared into the sand within about 50 yards of the outfall. At low tide, the sand flats seem to act as absorbents and filters. In course of time it is possible that, as in the case of other filters, considerable impurity may become established, the sand may become charged with a maximum quantity of impurity, and the area of infection may widen, but in the Solway those sand flats are subject to frequent change, and after viewing the conditions established I regard them as less alarming than I had feared. Also the positions chosen for the outfalls do not coincide with the positions of the stake nets, and I anticipate that the nets will be able to be fished without any marked loss attributable to the pollutions.

With regard to the season's net fishing in this section of the Solway, I am unable to make any very definite statement. The nets along the Scottish side above the Viaduct were not doing so well as the Newbie nets, but the channel of the Solway had travelled away across to the English side, so that the nets were a mile and a half to two miles from the main run of the fish, the intervening space, at low tide, being sand flats. No true test of any changed conditions has yet been possible.

With regard to the Gretna Sewer and its rather objectionable effluent, I may add that the pollution is at present quite untreated, being poured direct into the tidal portion of the river Esk. There are about 7000 people in the Gretna Settlement, and on sanitary grounds it has seemed desirable that some treatment should be resorted to. I learned that a proposal is on foot to throw down the solids, and, by converting the lower portion of the sewer pipe into a tank, to secure an arrangement by which, by tidal action, an automatic discharge will take place.

#### NITH.

I regret to state that the proposals lately introduced for the improvement of the stock of salmon in this district, by the reduction of netting, have been abandoned. With regard to the legality of the methods used in netting below Dumfries Caul, certain proprietors are taking action in the Courts.



## DEE (SOLWAY).

An action in the Court of Session is pending between the Salmon Fishery Proprietors and the Galloway Engineering Co., in view of works which the latter have erected at Tongland on the lower river.

## LOCHY.

In this district works are in contemplation for the carrying of water into the Leven District, in order to supply power at the Kinlochleven works of the British Aluminium Co.

## FORTH.

The netting results in the tidal waters between Stirling and Alloa have kindly been supplied to me since 1907, and I have already had occasion to make reference to the serious decline in the salmon fisheries which has set in.

This decline will be appreciated from the following triennial averages of the catch.

1907-9	1910-12	1913-15	1916-17
4252	4092	2347	758

The last figure represents only two years.

In a period of only eleven years, the decline is extraordinarily rapid. The nettings are now carried on at a loss, and, after the present season, may be expected to cease.

The action of pollutions coupled with the great abstraction of pure water to Glasgow have now practically annihilated the fishings. With the diminished supply of water, the river is now unable to clear itself of the complex and toxic discharges.

Salmon and sea trout are killed in large numbers during the summer months, especially when spring tides occur to stir up the foul deposits which settle on the river bed.

It was in 1913 that proposals were made to take additional water to Glasgow from Lochs Voil and Doine, and in referring to that matter and to the pollutions in the *Thirty-third Annual Report* (p. 253) and *Twenty-second Annual Report* (p. 248) I stated that one of the most serious eventualities, in my opinion, was that if this further abstraction of water took place the mortality which then occurred in dry summers amongst fish below Stirling, would become more or less constant. I fear that even without the abstraction of the additional water, but by the steady increase of pollutions, the condition has already become more or less constant, and that my gloomy prognostications about the annihilation of the local salmon fisheries have now been fulfilled to all intents and purposes. A small stock of fish no doubt is still able to penetrate the polluted zone, but the numbers produced are not sufficient for the upkeep of a commercial fishery. And I venture to repeat that the impurities are capable of treatment, and that it might still be possible to resuscitate the fisheries.

## ARTIFICIAL HATCHING.

In many quarters, a decline of a stock of fish is regarded simply as a difficulty which can be got over by the increase of artificial hatching. On the Pacific Coast of North America, for instance, the enormous quantities

of salmon captured and canned are ostensibly provided against, by the establishment of many and large hatcheries, and if the commercial fishing becomes more intense, the simple remedy is to increase the hatcheries at State expense. Incidentally, it is somewhat significant that at the present time the salmon fishery authorities in that region are becoming somewhat alarmed by the decline, although the hatcheries seem to have increased in number. When, however, we are faced by a condition such as that of the Forth, where the evil at the root of the salmon decline is pollution of a gross kind, hatching, whether natural or artificial, is no remedy. The pollutions of the tideway have to be gone through by the young fish on their first descent to the sea, as by the adult fish on their return. Special attention has recently been given to this subject in view, largely, of the possibilities of food production. In my opinion, it has always been very difficult to establish a clear case in favour of artificial hatching, because it is very difficult to obtain definite and convincing proof that hatching operations can be carried on with the certain hope of success. I do not for a moment say that artificial hatching cannot be shown to have succeeded, but it has always appeared to me that the conditions under which success can be secured are somewhat uncertain.

One may state without contradiction, I fancy, that the hatching of purely fresh water fish, including trout, is a very different thing from the hatching of a migratory fish like the salmon. This is because the time of the first migration to the sea appears to be the time of greatest danger to the salmon, and to be the period in the fish's life when most loss occurs. Salmon eggs are buried in the gravel of the river bed during the time of incubation, and in this way are protected from their numerous enemies. I do not say that the protection is absolute, but it appears to me that if the protection were not good, either we should have had no great stock of salmon in the past, or, in order that a natural and inevitable loss should be overcome, the salmon naturally, like a herring (also in view of past abundance) would have laid a much greater number of eggs. The actual hatching, whether of salmon or of trout eggs, is a comparatively simple business, and in hatcheries a high percentage of healthy alevins is common.

We don't know very much about the percentage attained by Nature's method, but I notice that those who advocate artificial hatching usually take it for granted that the protection of a hatchery gives a far better result in this respect than Nature's method can possibly do. I have always been sceptical of this opinion. It is certainly the case that in streams where a bed of rock is covered by only a shallow amount of gravel, the floods which rise with great rapidity and to a great height under modern conditions of land drainage, are likely to carry away the gravel with its contained eggs. It may be granted also that fishes and birds prey upon any eggs they can find, and feed freely upon fry, parr, and smolts. This happens also in the sea, and happens apparently in much greater degree. Still the resuscitation of a trout stream or lake, other things being equal, is admittedly an easier matter than the resuscitation of a salmon river. When smolts go to the sea, they pass completely beyond the control of those who have hatched and tended them. They have learned something of enemies on their way to the sea, but they now fall into the midst of a host of new enemies. The pike and the cormorant may have dashed at them in the river, but on entering the sea, a shoal of coal fish may be in wait for them. To run the gauntlet of these is indeed difficult, and we know of cases where for many days, during the smolt descent, shoals of coal fishes have devoured smolts steadily. I have known of 16 parr in one cormorant fishing in a river, but that is of no moment compared to 5 or 6 smolts in each of a shoal of coal fish day after day. The run of smolts is inevitably cut down to a very

great extent, and we know that many other predatory fishes in the sea beyond will also endeavour to secure them. Even the comparatively sluggish cod appears to be successful, for a smolt marked with silver wire was once recovered from a cod's stomach. Those smolts which have been fortunate to escape all the dangers, take their own toll at last from the small herring, but it is apparently in this early life in the sea that so many drop out.

Under natural conditions, if the interference of man is not great, salmon can be extraordinarily numerous, and with all the dangers to be encountered in the sea, the protection of the ova in the redds cannot be poor, nor can the natural process of reproduction yield a small relative hatch. Even dog-fish, which produce very few eggs indeed, but which protect their eggs each in a leathery envelope, can be extraordinarily numerous. And in support of the method of Nature, for it is practically a return to it, I notice that Mr. Babcock, the Deputy Commissioner of Fisheries in British Columbia, recommends in his most recent report that the eggs treated in the various hatcheries over which he has supervision should now be laid in gravel, since after a series of experiments distinct advantage results, both in the health of the alevin and in freedom from disease.

Granted the high percentage attained in most hatcheries, it is of importance to notice at what stage the young fish are turned out, and especially what return in adult fish can be or is secured. The commonest way is to turn out fry, and no doubt this saves an infinite amount of trouble and expense. In America, however, rearing appears to be rather on the increase, in order to carry the young fish beyond the early dangers.

In the case of the Weser in Germany, the hatching operations of Herr Jaffe show a return of three adults per thousand fry. This figure is arrived at by comparing the return of salmon from the nets of the lower river, and the output of fry from the hatcheries, it being contended that since the weir at Hamelin prevents fish from getting up to spawn in the upper river, and since the bottom of the river below the weir is soft mud where salmon eggs could not hatch, the only upkeep of stock possible is from the hatcheries. There seems some slight reason for the view that possibly more salmon spawn naturally than is supposed, but if this is the case, the return for the artificial hatching is so much smaller. The result of three per thousand may probably be accepted, is certainly accepted in Germany, and is considered satisfactory.

In the United States, the percentage appears to be somewhat higher. If we refer to the operations on the eastern sea board, where the species is the Atlantic salmon as with us, we find that the return is about five per thousand, but that a certain number of fish are turned out at a later stage than fry. Here again the return is regarded as satisfactory.

It is instructive to examine a little further the history of the American hatching. In 1868 or thereby the opinion seems to have been held that the Atlantic salmon had become so scarce in the Penobscot and other rivers of the State of Maine that the species was in danger of becoming extinct. The Bureau of Fisheries decided to resuscitate the stock by artificial means, and began buying eggs from Canada. The confidence with which this policy was regarded may be gathered from the fact that at one time as much as £9 per thousand seems to have been paid for the ova, a sum estimated as equivalent to £135 for the eggs of a single female. The Penobscot fishery gradually increased as the hatching increased, and although the hatch of Atlantic salmon still forms but a small part of the immense total reached for other species, about two and a quarter million eggs are now treated annually, and the fishery seems to produce, with

fluctuations, about 10,000 fish. The *prima facie* case is here pretty strong.

The U.S.A. and Canada are conspicuous in the large development of hatching to meet the constant drain upon the fish stock, and resort is had to artificial hatching, as a Government proposition, for this purpose, rather than to any great restriction upon the catching power. The magnitude of the operations may be understood if I quote from the 1904 Report of the Bureau. In that year there were distributed from 49 stations and substations for hatching, 1,269,343,025 eggs, fry, fingerlings, yearlings, and adults. Some 35 species were treated, including some sea fish. The figures for the Quinнат salmon of the Pacific Coast are 75,217,354 eggs and 35,006,988 fry. The figures for the Atlantic salmon are small beside such outputs, being 25,500 eggs and 2,566,716 fry. One notices also that the statistics as to hatching are the first matters reported upon in the volume. It is right to state also that one gathers from the references to this or that species that if, for some reason or other, success does not follow a well sustained trial in a particular locality, further attempts with that species in that locality are suspended.

In the Merrimac river, north of Boston, success is also claimed for artificial hatching, as also in the river Hudson, but in the latter no real commercial fishery has ever been established, and it may very well be that other factors come in to stultify operations, and that artificial hatching or natural hatching are powerless to compete against pollutions and obstructions as in the more humble case of the river Forth to which I have already made reference.

I do not wish to deal specially with the very great hatching operations carried on in connection with the Pacific Coast rivers of America and Canada. The species handled differ from ours, and the habits of the fry in their descent to the sea are, in many cases, quite distinct. Also, a very complete digest of the subject was presented in evidence to the Royal Commission on Salmon Fisheries in 1901, by Mr. W. Murray, the upshot of whose evidence was to show that the reports concerning these Fraser and Sacramento operations were by no means sufficient to establish a case in favour of artificial hatching, and that the successful cases were really those connected with the hatching of trout in the Lake Superior district, or the treatment of other purely inland species.

One may refer, however, to the case of the Rhine. About the middle of last century the salmon fisheries of that river were regarded as on the point of extinction, and artificial hatching operations were taken up by Germany. These operations have been steadily carried on, though for obvious reasons one is not in a position to state what may have been done in the matter of output of fry in recent years. It may be taken as certain, however, that Germany does not continue hatching for the benefit of Holland, and it appears that Dutch fishermen can now sell from thirty to forty thousand salmon annually, and every one appears to be satisfied that this is chiefly the result of Germany's hatching.

We may also recall the recently reported success in the introduction of the Quinнат salmon to New Zealand, though this is qualified by the recollection of the failure in the case of the Atlantic salmon. It is noticeable also that from the first the hatching of trout in New Zealand has been a success, and that the descendants of the small brown trout introduced from England have become huge sea trout, a proof, if such were further needed, that there is but one species of trout.

Then we must remember also that the attempt made by America, and lasting some 10 or 12 years, to introduce Quinнат salmon to the eastern sea board failed, though recently, according to Dr. Kendall, who is said to know more about hatching in the State of Maine than any one else, a rather

inferior species, the Humpback, has been successfully introduced. This Humpback (*Oncorhynchus gorboscha*) was rather despised in earlier days in the Fraser River, but as the best species seem to decline from sheer overfishing, and especially from overfishing on the part of American fishermen, the affect of whose operations touch British Columbia, the less important species are canned to a greater extent than formerly.

Glancing again at the opposite side of this question, I would note the failure, previously described in the *Twenty-ninth Annual Report* (p. 247), of operations at M'Harry Inlet, Alaska, when for a period of 17 years hatching was carried on in order to increase the run of "red salmon"\* at the expense of humpbacks and dog salmon. The upshot was that, in spite of extensive hatching, and the barring of the two undesired species to the upper waters, the red salmon never become more numerous or the others less so.

When, before the war, it was possible in Scotland to carry on a certain amount of experimental work, I had hopes, as the Board are aware, of making a test of the actual return of artificially hatched salmon, in a West Coast river, the intention being to rear to the smolt stage and systematically mark the young fish, and to ascertain as far as the admirable conditions kindly offered would allow, the entire stock of fish, including the marked fish which returned to the river over a series of years. This had to be abandoned unfortunately.

The one instance we have in Scotland of definite proof of a return from artificial hatching is the result of the Glen Etive operations by Mr. Ian Nelson, already published as a separate paper, *Fisheries Scotland, Salmon Fish.*, 1914, I. (October 1914). From 40,000 salmon fry turned out in 1909 plus 1000 yearlings in 1910, 11 grilse were obtained in 1912, and 5 four year old salmon in 1913.

Of wild smolts marked when going to sea we may recollect the 5500 marked in the Tay by Mr. M'Nicol, and the return of 110 fish spread over a period of 4 years, viz. 43, 57, 8, and 2, which is equal to about 22 per 1000.

We have certainly had no adequate test of the relative returns of wild and artificially hatched smolts. If fry are liberated rather than smolts, it may be that the remnant become as capable of taking care of themselves as wild smolts, but the largest hatchery yet attempted with us—that of the Duke of Richmond and Gordon at Fochabers—has treated only a million eggs, while a varying number of the fry have been reared to the smolt stage. After 25 years' experience, this hatchery has recently been given up for want of any proof of a definite kind that benefit has resulted to the River Spey.

It may be that instead of one million, three or five millions should have been hatched so as to secure successful results. In any case, the chances of success would have been greater, or the results at least more obvious, but I confess to being brought up against the consideration whether or not in a hundred mile river of spawning beds like those of the Spey, with an increasing stock of fish, the continuance of artificial hatching on any scale is in any way necessary.

Further, the question may very fairly be asked with reference to Scotland in general, is a return of from 3 to 5 adult fish per thousand fry turned out really worth while, except in rivers where it is clear that natural spawning must certainly be most limited, as for instance in the Kirkaig or Morar, or where the redds are subject to exceptional danger from floods.

It is clear, I think, that if salmon hatching is extended, it should be

\* The Sockeye of Fraser River and Puget Sound, Bureau of Fisheries, Document No. 730.

carried out on a much larger scale than has yet been attempted with us, and this means the impounding or collecting of a very considerable number of spawners. We could not very well adopt the Pacific Coast method of killing the fish and taking the eggs. Our kelts do not all die. We have had a return of marked kelts afterwards recaptured as clean fish of 52½ per cent. It is of some interest to notice from the latest Canadian Report the number of fish which are necessary to stock Dominion hatcheries. At one pond as many as 3124 fish purchased, and 619 captured (in one day) were reserved, and produced 15,000,000 eggs. At another pond 2853 were reserved, and, after twelve deaths, yielded just under 5,000,000 eggs. Such collections may be distributed to several hatcheries, this being readily possible where the Government undertakes all hatching operations.

With us in Scotland, where the right of salmon fishing is a heritable estate like property in land, and where the interests of river districts are therefore somewhat self-contained, the argument in favour of State hatching does not apply with the same force; and if any given district decided to erect a hatchery capable, say, of treating 3,000,000 eggs, it would be necessary to reserve for stripping, supposing the average fish to be 10 lbs. in weight, yielding 800 eggs per pound weight of fish—375 females, and, say, a third of that number of males, making a total of 500 fish, not allowing for any deaths amongst the fish, or for the smaller return of eggs per pound weight of fish, which may readily occur if salmon are kept long in confinement. The collection of such a number of fish is not to be lightly undertaken, as any one who has netted rivers in the autumn will admit. It is done by impounding, however, at Lismore, on the Blackwater in Ireland.

It seems to me, therefore, that if we regard this whole question in an impartial manner, and are not unduly influenced by individual cases, it is evident that we have to do with successes on the one hand and failures on the other, without being well able to explain in every case the causes of either success or failure; that the returns in adult fish which may be expected from a success do not appear substantial in view of the natural conditions which obtain in Scotland, where we still have in a large number of rivers as fine spawning grounds as ever; and further that the provision of hatcheries by the State cannot be reasonably advocated in the case of Scotland owing to the nature of the title to salmon fisheries; while the operations of procuring adequate numbers of fish for stripping are beset by considerable difficulties, and that in the case of grossly polluted rivers artificial hatching is of no avail.

#### KELTS AND THE SPAWNING MARK ON SCALES.

At a time when not a few are arguing in favour of eating kelts, and are referring to results of salmon marking and scale examination to show that kelts seldom return as clean fish, it is well to remember that most of our netted fish are caught in the sea.

Apart altogether from the question of whether or not kelts should be eaten at the present time, it seems proper at least to correct a number of the biased statements as to our knowledge which have recently been advanced.

A fair number of salmon have been found with scales showing as many as three spawning marks, and as the majority of these fish were captured when in the kelt condition it is clear they had spawned four times. In one instance a kelt was found which had four spawning marks on its scales, and which had therefore spawned five times. These fish were all from the river Add in Argyll, and it may be that in other and similar West Highland rivers similar results could be found. The percentage of previously spawned fish



was in one year as high as 52½. In scales examined from East Coast rivers one spawning mark is certainly more common than two, and a percentage of 5 or 6 previously spawned fish is usual.

The results of the Board's research by the use of bag nets on the East Coast of Sutherland, so far as previously spawned fish are concerned, showed in 1913, 8·7 per cent., and in 1914, 10 per cent. From the special examination of 671 fish caught on a neighbouring stretch of coast, the percentage was found to be as high as 22.

It may be such figures are above the average, but it seems necessary to point out that in reality no one knows what the average is for the whole of Scotland, much less for England or Ireland. We might venture upon the statement that apparently the salmon in our West Coast rivers spawn much more frequently than do the fish on the East Coast, yet we must reflect that the West Coast fish are less numerous. We really know only what the average is of such groups of fish as we have examined in certain localities. Our sea results are rather higher than our river results on the East Coast, but again we have to recollect the high mortality amongst kelts in large rivers. It cannot be said, however, that kelts seldom return as clean fish, when it can be shown that in one case at least half the kelts captured during our February marking operations had spawned the previous year.

I am not stating these particulars for the purpose of objecting to the eating of kelts. I am not dealing with that subject at all, though I may add that those who eat kelts have my sympathy. The question arises out of war emergency, but a case in support should not be drawn, I think, from scale examination.

W. L. CALDERWOOD.

## APPENDIX Q.

## ANNUAL CLOSE TIMES APPLICABLE TO THE SALMON RIVERS IN SCOTLAND.

*N.B.*—Observe that, in the following List, the days fixing the commencement and termination of the Annual Close Time for Net-fishing and for Rod-fishing, respectively, are in all cases inclusive, as in the case of the Add, the first river in the List.

Name of River.	Annual Close Time for Net-fishing.	Annual Close Time for Rod-fishing.
Add . . . . .	From Sept. 1 to Feb. 15, both days inclusive.	From Nov. 1 to Feb. 15, both days inclusive.
Aline . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Alness . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Annan . . . . .	From Sept. 10 to Feb. 24.	From Nov. 16 to Feb. 24.
Applecross . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Arnisdale ( <i>Loch Hourn</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Awe . . . . .	From Aug. 27 to Feb. 10.	From Oct. 16 to Feb. 10.
Aylort ( <i>Kinloch</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Ayr . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Baa and Goladoir . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Badachro and Kerry ( <i>Gairloch</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Balgay and Shieldag . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Beaully . . . . .	From Aug. 27 to Feb. 10.	From Oct. 16 to Feb. 10.
Berriedale . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Bervie . . . . .	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Bladenoch . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Broom . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Brora . . . . .	From Aug. 27 to Feb. 10.	From Oct. 1 to Jan. 10.
Carradale ( <i>in Cantyre</i> ) . . . . .	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Carron . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Clayburn, Finnisbay, Avennangeren, Strathgravat, North Lacastile, Scalladale, and Mawrig ( <i>East Harris</i> ) . . . . .	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Clyde and Leven . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Conon . . . . .	From Aug. 27 to Feb. 10.	From Oct. 16 to Jan. 25.
Cree . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Creed or Stornoway, and Laxay ( <i>Island of Lews</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Creran ( <i>Loch Creran</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Croe and Shiel ( <i>Loch Duich</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Dee ( <i>Aberdeenshire</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Dee ( <i>Kirkcudbrightshire</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Deveron . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Don . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Doon . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Drummachloy or Glenmore ( <i>Isle of Bute</i> ) . . . . .	From Sept. 1 to Feb. 15.	From Oct. 16 to Feb. 15.
Dunbeath . . . . .	From Aug. 27 to Feb. 10.	From Oct. 16 to Feb. 10.
Earn . . . . .	From Aug. 21 to Feb. 4.	From Nov. 1 to Jan. 31.
Eckaig . . . . .	From Sept. 1 to Feb. 15.	From Nov. 1 to Feb. 15.
Esk, North . . . . .	From Sept. 1 to Feb. 15.	From Nov. 1 to Feb. 15.
Esk, South . . . . .	From Sept. 1 to Feb. 15.	From Nov. 1 to Feb. 15.
Ewe . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.



Name of River.	Annual Close Time for Net-fishing.	Annual Close Time for Rod-fishing.
Fincastle, Meaveg, Ballanachist, South Lacastile, Borve, and Obb ( <i>West Harris</i> )	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Findhorn	From Aug. 27 to Feb. 10.	From Oct. 11 to Feb. 10.
Fleet ( <i>Sutherlandshire</i> )	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Fleet ( <i>Kirkcudbrightshire</i> )	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Forss	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 24.
Forth	From Aug. 27 to Feb. 10.	From Nov. 1 to Jan. 31.
Fyne, Shira, and Aray ( <i>Loch Fyne</i> )	From Sept. 1 to Feb. 15.	From Nov. 1 to Feb. 15.
Girvan	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Glenelg	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Gour	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Greiss, Laxdale, or Thunga.	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Grudie or Dionard	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Gruinard and Little Gruinard	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Halladale, Strathy, Naver, and Borgie	From Aug. 27 to Feb. 10.	From Oct. 1 to Jan. 11.
Helmsdale	From Aug. 27 to Feb. 10.	From Oct. 1 to Jan. 10.
Hope and Polla or Strathbeg	From Aug. 27 to Feb. 10.	From Oct. 1 to Jan. 11.
Howmore	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Inchard	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Inner ( <i>in Jura</i> )	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Inver	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Iorsa ( <i>in Arran</i> )	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Irvine and Garnock	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Kannaird	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Kilchoan or Inverie ( <i>Loch Nevis</i> )	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Kinloch ( <i>Kyle of Tongue</i> )	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Kirkaig	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Kishorn	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Kyle of Sutherland	From Aug. 27 to Feb. 10.	From Oct. 1 to Jan. 10.
Laggan and Sorn ( <i>Island of Islay</i> )	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Laxford	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Leven	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Little Loch Broom	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Lochy	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Loch Duich	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Loch Luing	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Loch Roag	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Lossie	From Aug. 27 to Feb. 10.	From Oct. 16 to Feb. 10.
Luce	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Lussa ( <i>Island of Mull</i> )	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Moidart	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Morar	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Mullanageren, Horasary, and Lochnaciste ( <i>North Uist</i> )	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Nairn	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Naver and Borgie, <i>see</i> Halladale.		
Nell, Feochan, and Euchar.	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Ness	From Aug. 27 to Feb. 10.	From Oct. 16 to Feb. 1.
Nith	From Sept. 10 to Feb. 24.	From Dec. 1 to Feb. 24.
Orkney Islands ( <i>River from Loch of Stenness, &amp;c.</i> )	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 24.
Ormsary ( <i>Loch Killisport</i> ), Loch Head, and Stornoway ( <i>Mull of Cantyre</i> )	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Pennygowan or Glenforsa, and Aros	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.

Name of River.	Annual Close Time for Net-fishing.	Annual Close Time for Rod-fishing.
Resort . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Ruel . . . . .	From Sept. 1 to Feb. 15.	From Nov. 1 to Feb. 15.
Sanda . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Scaddle . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Shetland Islands ( <i>River of Sandwater, &amp;c.</i> ) . . . . .	From Sept. 10 to Feb. 24.	From Nov. 16 to Jan. 31.
Shiel ( <i>Loch Shiel</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Sligachan, Broadford, and Portree ( <i>Isle of Skye</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Snizort, Orley, Oze, and Drynoch ( <i>Isle of Skye</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Spey . . . . .	From Aug. 27 to Feb. 10.	From Oct. 16 to Feb. 10.
Stinchar . . . . .	From Sept. 10 to Feb. 24.	From Nov. 15 to Feb. 24.
Tay (except Earn) . . . . .	From Aug. 21 to Feb. 4.	From Oct. 16 to Jan. 14.
Thurso . . . . .	From Aug. 27 to Feb. 10.	From Oct. 6 to Jan. 10.
Torridon, Balgay, and Shieldag . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Tweed . . . . .	From Sept. 15 to Feb. 14.	From Dec. 1 to Jan. 31.
Ugie . . . . .	From Sept. 10 to Feb. 24.	From Nov. 16 to Feb. 24.
Ullapool ( <i>Loch Broom</i> ) . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Urr . . . . .	From Sept. 10 to Feb. 24.	From Nov. 30 to Feb. 24.
Wick . . . . .	From Aug. 27 to Feb. 10.	From Nov. 1 to Feb. 10.
Ythan . . . . .	From Sept. 10 to Feb. 24.	From Nov. 1 to Feb. 10.

APPENDIX R.

LIST OF CHAIRMEN AND CLERKS OF SALMON FISHERY DISTRICT BOARDS IN SCOTLAND.

DISTRICT.	Name and Address of Chairman.	Name and Address of Clerk.
Alness . . .	Andrew Mackenzie, Esq., Dalmore House, Alness.	William J. Duncan, Solicitor, Dingwall.
Annan . . .	John T. M'Glasson, Esq., Newbie Villa, Annan.	J. C. R. Macdonald, 84 Irish Street, Dumfries.
Awe . . .	The Duke of Argyll, Inveraray Castle, Inveraray.	Alex. MacArthur, Solicitor, Oban.
Ayr . . .	Richard A. Oswald, Esq., of Auchincruive, Ayr.	C. Young, W.S., County Buildings, Ayr.
Balgay . . .	C. R. Manners, Esq., C.E., 12 Lombard Street, Inverness.	Duncan Shaw, W.S., 15 High Street, Inverness.
Bervie . . .	David Scott Porteous, Esq., of Lauriston, as Mandatory of the Commissioners of Woods and Forests.	W. C. Walls, Solicitor, Montrose.
Broom . . .	W. Ewing-Gilmour, Esq., of Inverlael, per A. W. G. Aitken, Esq., S.S.C., Edinburgh.	W. R. T. Middleton, Solicitor, Dingwall.
Carron (W. Ross)	Baron von Schroder of Attadale.	Arthur H. Duncan, Solicitor, Dingwall.
Conon . . .	John Little Mounsey, Esq., W.S., 5 Thistle Street, Edinburgh, Commissioner for Col. J. A. F. H. Stewart Mackenzie of Seaforth.	W. R. T. Middleton, Solicitor, Dingwall.
Cree . . .	The Earl of Galloway, Cumloden, Newton-Stewart.	A. B. Matthews, Solicitor, Newton-Stewart.
Dee (Aberdeen)	The Lord Provost of Aberdeen.	Alex. Duffus, Advocate, Aberdeen.
Dee (Solway) . . .	Thomas Cross, Esq., Mandatory for Sir Charles Hope Dunbar, Bart., of St. Mary's Isle.	John Gibson, Solicitor, Kirkcubright.
Deveron . . .	Wm. MacIntosh, Esq., Fife Lodge, Banff.	James Morrison, Solicitor, Banff.
Don . . .	George Davidson, Esq., Wellwood, Aberdeen.	Alex. Duffus, Advocate, Aberdeen.
Doon . . .	Marquis of Ailsa, Culzean Castle, Maybole.	C. Young, W.S., County Buildings, Ayr.
Dunbeath . . .	Mandatory of Commissioners of Woods, etc., London.	D. W. Georgeson, Solicitor, Wick.
Esk (North) . . .	W. Douglas Johnston, Esq. (as Mandatory for Proprietors of Morphy Fishings), Montrose.	J. R. Findlay, Solicitor, Montrose.
Esk (South) . . .	J. Noel Johnston, Esq., Montrose.	D. S. Campbell, Solicitor, Montrose.
Feochan . . .	The Marquis of Breadalbane, Taymouth Castle, Aberfeldy.	Alex. MacArthur, Solicitor, Oban.
Findhorn . . .	Sir R. C. Munro Ferguson, Bart., of Novar, per J. J. Meiklejohn, Esq., factor.	C. Grant Mackenzie, Solicitor, Forres. Jas. Munro, National Bank Buildings, Forres, Clerk <i>ad interim</i> in Mr. Mackenzie's absence.
Forth . . .	Mandatory of Commissioners of Woods, etc., London.	Henry Robb, 11 Barnton Street, Stirling.
Girvan . . .	John Campbell Kennedy, Esq., of Dunure.	T. Gerald Tait, Solicitor, Girvan.
Gruinard and Little Gruinard	Alfred N. G. Aitken, Esq., S.S.C., Edinburgh, Factor and Commissioner for Hugh Mackenzie, Esq., of Dundonnell.	W. R. T. Middleton, Solicitor, Dingwall.
Kyle of Sutherland	Sir Charles Lockhart Ross, Bart., of Balnagowan.	John M'Crone, Solicitor, Dornoch.

## APPENDIX R.—(continued)—LIST OF CHAIRMEN AND CLERKS OF SALMON FISHERY DISTRICT BOARDS IN SCOTLAND.

DISTRICT.	Name and Address of Chairman.	Name and Address of Clerk.
Little Broom	Alfred N. G. Aitken, Esq., S.S.C., Edinburgh, Factor and Commissioner for Hugh Mackenzie, Esq., of Dundonnell.	W. R. T. Middleton, Solicitor, Dingwall.
Lochy	Factor and Mandatory for the Trustees of the late Lord Abinger, Inverlochry Castle, Fort-William.	Duncan Maclachlan, Solicitor, Fort-William.
Nairn	Brodie of Brodie, Brodie Castle, Forres.	H. T. Donaldson, Solicitor, Nairn.
Ness	Captain E. C. Ellice of Glengarry, Fort-Augustus.	Anderson & Shaw, Solicitors, Inverness.
Nith	The Provost of Dumfries.	J. E. Blacklock, Solicitor, Irish Street, Dumfries.
Sligachan, Broadford, & Portree (Skye)	The Hon. Godfrey MacDonald, Portree.	Kenneth Macrae, Sheriff-Clerk, Portree.
Snizort, Orley, Oze, and Drynock (Skye)	The Hon. Godfrey MacDonald, Portree.	Kenneth Macrae, Sheriff-Clerk, Portree.
Spey	The Duke of Richmond and Gordon, Gordon Castle, Fochabers, per George Muirhead, Esq., Commissioner.	T. R. Mackenzie and A. F. Macdonald, Solicitors, Elgin.
Stinchar	The Earl of Stair, Lochinch, Wigtownshire.	Stair M'Harrie, Rephad, Stranraer.
Tay	The Earl of Moray, Kinfauns Castle, Perth.	Condie, Mackenzie, & Co., Solicitors, Perth.
Thurso	Peter Keith, Esq., Mandatory for Archibald H. M. Sinclair, Esq., of Ulbster.	David Keith-Murray, Solicitor, Thurso.
Torridon	C. R. Manners, Esq., C.E., 12 Lombard Street, Inverness.	Duncan Shaw, W.S., 15 High Street, Inverness.
Tweed (Police Committee of the Commissioners)	Sir Richard John Waldie-Griffith, Bart., of Hendersyde Park, Kelso.	David W. B. Tait, W.S., Kelso.
Ugie	Lieut-Col. Ferguson, of Pitfour, Mintlaw.	David Troup, Solicitor, Peterhead.
Wick	Mrs. Duff Dunbar, of Hempriggs, Ackergill Tower, Wick.	D. W. Georgeson, Solicitor, Wick.
Ythan	Earl of Errol, Slains Castle, Aberdeenshire.	D. M. A. Chalmers, Advocate, Aberdeen.

*Note.*—In addition to the districts specified above, the Duke of Sutherland is sole proprietor in the following river districts:—Helmsdale, Brora, and Fleet, on the east coast, Laxford, and Inchard, on the west coast, Halladale, Naver and Borgie, and Kinloch, on the north coast (under the charge of his factor, Mr. John Morrison, Sutherland Estate Office, Golspie); Mr. J. W. Stewart is sole proprietor in the Inver and Kirkaig districts (in charge of his factor, Mr. Murdo Kerr, Assynt Estate Office, Lochinver); Mr. W. E. Gilmour of Rosehall is sole proprietor of the rivers Dionard, Polla, Strathy, and Armadale, and part owner, with the Duke of Sutherland, of the River Hope district (Mr. A. Gunn, Overseer, Durness, by Lairg, acts for Mr. Gilmour); Lord Lovat has practically sole rights of fishing in the river Beauly (under the charge of his factor, Mr. J. T. Garrioch, Estate Office, Beauly); and the Countess of Cromarty is sole proprietrix of the district of the river Kannaird (under the charge of her factor, Mr. Alex. Taylor, Cromarty Estate Office, Kildary).

# FISHERY BOARD FOR SCOTLAND—(continued).

## SALMON FISHERIES, 1915.

I. Salmon Research in 1915; Sea Netting Results—third paper. *With Chart and Diagram.* (1916.) Price 1s., post free 1s. 2d.

II. Salmon of the East Coast of Sutherland. Statistics of Catch, based on Scale Examination. *With 10 Diagrams.* (1916.) Price 9d., post free 10d.

## SCIENTIFIC INVESTIGATIONS, 1909.

I. Report on Larval and later Stages of certain Decapod Crustacea. *Illustrated.* (1911.) Price 2s. 3d., post free 2s. 4½d.

## SCIENTIFIC INVESTIGATIONS, 1910.

I. Reproductive Organs of *Sparus Centrodontus*, *Sparus Cantharus*, *Sebastes Marinus*, and *Sebastes Dactylopterus*; and on the Ripe Eggs and Larvae of *Sparus Centrodontus* (?) and *Sebastes Marinus*. (1911.) Price 1s. 6d., post free 1s. 8d.

II. Retardation of the Development of the Ova of the Herring. (1911.) Price 4d., post free 5d.

## SCIENTIFIC INVESTIGATIONS, 1911.

I. Notes on some small Crustacea from the "Goldseeker" Collections. (1912.) Price 9d., post free 10d.

II. Report on Diseases and Abnormalities in Fishes. *With Plates.* (1913.) Price 2s.; post free 2s. 2d.

## SCIENTIFIC INVESTIGATIONS, 1912.

I. Eggs of certain Skates (Raia). *With Plates.* (1913.) Price 6d., post free 7½d.

II. Distribution of the Larvae of the Eel in Scottish Waters. (1913.) Price 4d., post free 5d.

## SCIENTIFIC INVESTIGATIONS, 1913.

I. Aberdeen Trawling Statistics, 1912. Price 3s. 6d., post free 3s. 9d.

II. Deep Sea Currents of the North Sea, as ascertained by means of Drift Bottles. Second Report. *With Charts.* Price 1s. 6d., post free 1s. 8d.

III. Spawning Areas of Sand-eels in the North Sea. *With Chart.* (1914.) Price 4d., post free 5d.

## SCIENTIFIC INVESTIGATIONS, 1914.

I. European Races of Herrings. A Short Résumé of the Researches into the, and the Method of Investigations. (1914.) Price 6d., post free 7d.

II. Distribution of Plaice Eggs in the Northern North Sea. *With Text Figures and Chart.* Price 2s., post free 2s. 2d.

III. Aberdeen Fishery Statistics, 1913. *With Charts.* (1915.) Price 3s., post free 3s. 2½d.

IV. Mean Sea Level and its Fluctuations. *With Charts.* (1915.) Price 1s., post free 1s. 1½d.

## SCIENTIFIC INVESTIGATIONS, 1915 AND 1916.

None published in consequence of the war.

## SCIENTIFIC INVESTIGATIONS, 1917.

I. Aberdeen Fishery Statistics, 1914–16. *With Charts.* (1917.) Price 4s., post free 4s. 2d.

## FISHING BOAT MOTOR ENGINES.

Report on Fishing Boat Motor Engines exhibited, &c., at the North Sea Fisheries Exhibition, Yarmouth, Nov. 1910. (1911.) Price 2d., post free 3d.

Do. at the Fisheries and Marine Motor Exhibition, Copenhagen, July and August 1912. (1912.) Price 1d., post free 2d.

# FISHERY BOARD FOR SCOTLAND—(continued).

FISHERY AND HYDROGRAPHICAL INVESTIGATIONS, 1908-1911.

FIFTH REPORT (NORTHERN AREA) ON FISHERY AND HYDROGRAPHICAL INVESTIGATIONS IN THE NORTH SEA AND ADJACENT WATERS, conducted in co-operation with the International Council for the Exploration of the Sea, 1908-1911.

I. Observations on the Plaice from the "Goldseeker" Experiments, and from the Statistics of the Aberdeen Market; II. Distribution and Seasonal Abundance of Flatfishes (*Pleuronectidae*) in the North Sea, and the Fluctuations in their Abundance, 1901-1910; III. Marking of Plaice and other Fish by the S.S. "Goldseeker," 1904-1909; IV. Egg-production of certain Fishes; V. Statistics of Trawled Fish landed at Aberdeen, 1908-1911, showing the Place and Season of Capture; VI. Hydrographical Investigations in the North Sea and the Faeroe Channel, 1909-1910. *With Charts and Diagrams.*

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## SCOTTISH FRESHWATER FISHERIES COMMITTEE.

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Procedure of the Committee; General Observations; Trout; Salmon and Sea Trout; Coarse Fish; Eels; Angling for Salmon and Trout; Protection and Development of Freshwater Fisheries; Recommendations; Appendix. (1917.) Price 2d., post free 3d.

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## SCOTTISH SEA FISHERIES COMMITTEE.

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SCOTTISH DEPARTMENTAL COMMITTEE appointed to inquire into and report upon certain matters connected with the Development of the Scottish Sea Fishing Industry, after visiting the various Countries engaged in Fishing in the North Sea.

VOL. I. REPORT.—General survey of the conditions under which the Fisheries in the North Sea and adjacent seas are carried on, with maps; detailed surveys of the Norwegian, Swedish, Danish, German North Sea and Baltic, and Dutch Sea Fisheries; Fishery Administration, Scientific Research, and Educational Facilities for Fishermen in those Countries; the nature of the means of capture and the methods by which fishermen obtain the necessary capital to maintain the efficiency of their vessels and equipment; Summary of Recommendations; &c. With Appendices.

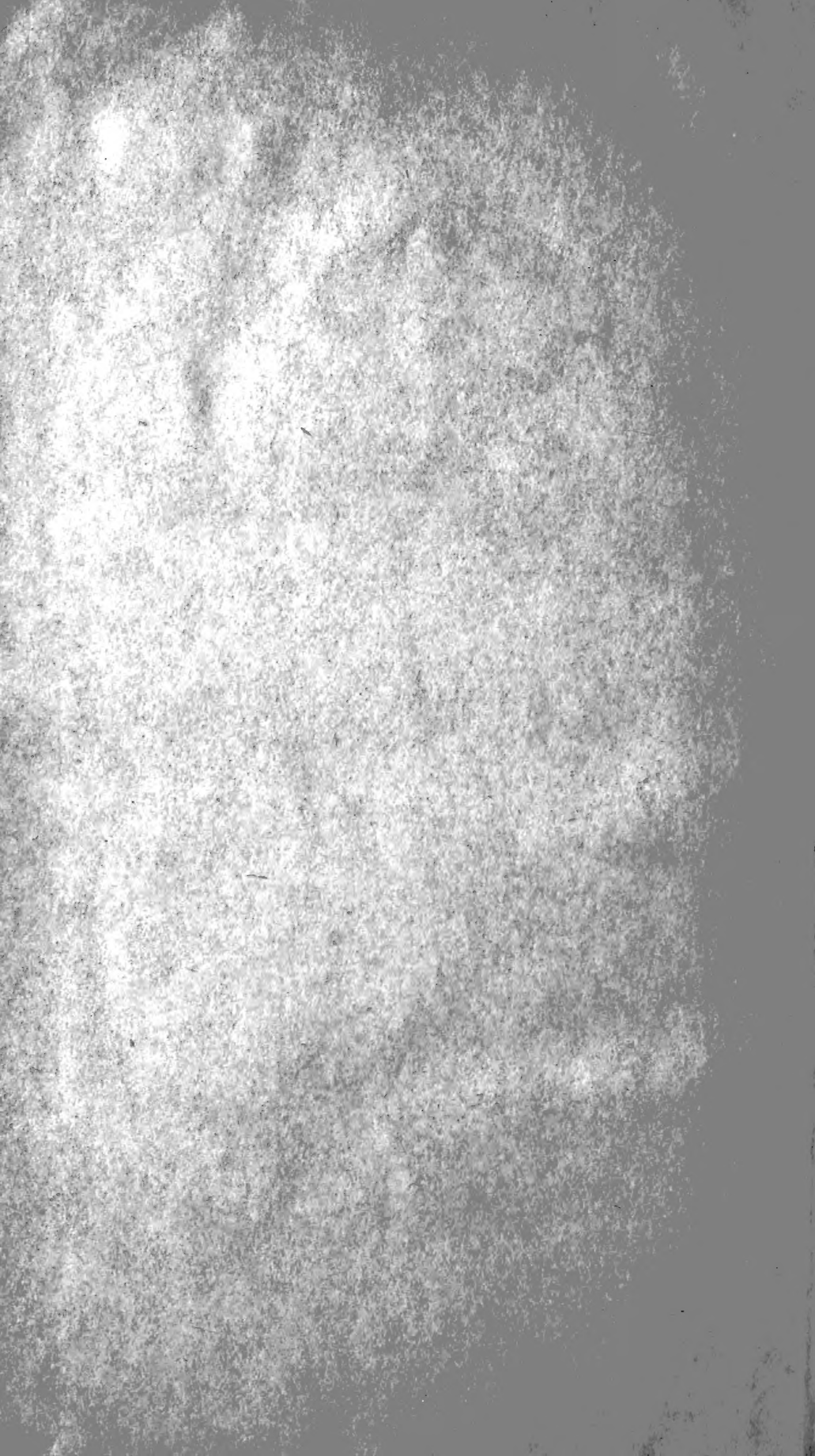
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VOL. II. MINUTES OF EVIDENCE.—Contains list of witnesses examined from Feb. 27, 1912, to May 16, 1913, and the Evidence taken; also selected written Statements furnished by Witnesses. With Index to the Minutes of Evidence.

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