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On the Feasibility of Producing Summary Tables  
of Numbers of Individuals Landed by Centimeter  
Length Groups.

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At the 1961 Annual Meeting, the Working Group on Sampling and Discards proposed the following recommendation which was approved by the Commission:

"The Group also considered that summary tables giving the total numbers of fish of each length caught by each gear in each division during the year would be helpful, and recommended that the Secretariat should consider the feasibility of producing such tables".

Species.

The only species for which our Statistical Bulletin can give complete data as to gear and divisions are cod, haddock, redfish and halibut. As no sampling is reported for the halibut, this means that the only species to include in the Summary Tables are cod, haddock and redfish.

Type of Gear.

In Tables 2 to 6 of the Statistical Bulletin showing landings by divisions and gears, the following categories of gears are used: otter trawls, pair trawls, dory vessel, hook and line, miscellaneous. Under hook and line are considered long-lines and hand-lines, whereas jigs and other possible hook gears are included in miscellaneous together with traps and a number of other gears of only minor importance.

For the purpose of establishing Summary Tables giving the landings in numbers for each length group, it should be considered to separate the traps (and pound nets) from the other gears listed either under "small boats" or under "miscellaneous", because the traps in certain areas take a considerable part of the cod catch. In Subarea 3 in 1958, the total catch was 392,796 metric tons of which the otter trawlers took some 95,000 tons, the traps 64,000 tons, and finally, pair trawlers 29,000 tons. Thus, here the traps come in as the number two gear in importance.

If we are to consider traps separately in this connection, it would be advisable also to list traps separately in Table 2 giving cod landings. In that case, the monthly landings or the totals in the vertical column to the right in this table could be used directly for the calculation of number of individuals by centimeter groups.

The Samples.

The samples fall in 4 main categories: commercial landings, commercial landings before discard, exploratory catches (in some cases termed "survey") and research catches. We can be pretty sure that samples listed as commercial landings give the measurements after discard. What is listed as exploratory catches may be measured either before or after discards. When such samples are reported to the Commission, it is in most cases not stated whether they are taken before or after discard, and the length distributions do not give any information as to this problem.

For instance, we have exploratory samples by USSR from 3L of which one sample from January ranges from 51 to over 102 cm, with a mean length of 79.8 centimeters, whereas another sample from July in the same subdivision ranges from below 29 cm to about 102 cm, with a mean length of only 49.3 cm. Also for cod in 3L, German exploratory catches differ widely in length: of two such catches from September in 1959, one has a mean size of only 69.3 cm, the other a mean size of not less than 87.6 cm. The latter is from a depth of more than 165 fathoms, the former from a depth smaller than 165 fathoms.

Also for the research samples we are not always aware of whether they include measurements before or after discards; from the term used, "research samples", one would assume that the samples were measured before discards but the length distribution does not always support this assumption.

In the southern part of the Convention Area, where Canadian and US samples predominate, the number of actual commercial samples compared to exploratory and research samples is rather large. Even in 3L where also European samples play a considerable role, the commercial samples are in the majority: 1959, commercial samples 19, commercial samples before discard 1, exploratory samples 5, research samples, 1. In the northern Subarea 1, where the sampling is carried out by European vessels, and mostly either by observers on board the fishing vessels or from research vessels, the actual commercial samples are in the minority: 1959, commercial samples 6, commercial samples before discard 12, exploratory samples 32, research samples 31. It is felt that especially when such samples have to be used for the present purpose, it should always be noted whether a sample is measured before or after discard, and that information as to mesh- or hook size be given.

The length groups to be applied in the Summary Tables should be those used in reporting the samples, namely, redfish -1 cm, haddock - 2 cm, and cod - 3 cm. Some redfish samples are now reported in 2cm groups.

The method of measuring the specimens varies somewhat from country to country in spite of all efforts through the years to ensure conformity in measuring. Some countries measure the total length, others use fork length. Some countries measure to the centimeter below, others to the nearest centimeter. It is felt that, for the preparation of tables as those considered here, the difference between the end results of these diverging measuring methods is rather insignificant.

#### Coverage.

The degree to which the samples cover the various categories of landings appears from the attached tables 1-4. The tables give for 1959 for selected regions and species: Subarea 1-Cod; Division 3L - Cod; Division 3O and 4W - Haddock and Division 3K and 5Y- Redfish, monthly landings by gear and country with letters noting the corresponding samples (C - Commercial Samples after discard; B- Commercial Samples before discard; E - Exploratory Samples, and R - Research Samples; the figures denote mean lengths of samples.

In Table 1 redfish (only otter trawl) we have for 5Y an example of a complete coverage. Only U.S.A. fishes redfish here, and this country reports commercial samples for all months. The mean lengths of the samples vary from 22 cm in January and February to 28 cm in September. When preparing the Summary Tables it is to be considered whether the monthly length distributions should be applied to the monthly landings or whether it would be sufficient to apply the average length distribution to the total landings of the year.

The table also shows the case of 3K, the division yielding the largest landings of redfish. Iceland and U.S.S.R. account for the main bulk of the landings. No commercial samples at all are reported; the Icelandic samples are marked "Survey", the U.S.S.R. "Exploratory". As the two countries do not report commercial samples, we have no means for deciding whether or not the Survey and Exploratory samples can be used as substitute for commercial samples. The "closest" commercial samples are Canadian from 3N and O; but with the considerable differences in lengths between divisions and countries (see 1962 Annual Meeting Document No. 2) it would hardly be safe to apply Canadian samples to Icelandic and U.S.S.R. landings; this also appears from the following comparison (mentella):

<u>Canada, Commercial</u>	<u>Iceland, Survey</u>	<u>U.S.S.R. Exploratory</u>
3N July - 27.5 cm	3K July - 36.2 cm	3K July-35.5 cm; 3L July -35.7 cm
" Aug - 27.3 cm	3M July - 33.1 cm	3K Aug -35.9 cm; 3L Aug -34.6 cm
" Sep - 27.6 cm		
3O May - 25.8 cm		3K May-38.4 cm; 3L May- 36.9 cm

Judging from the mean lengths of the U.S.S.R. samples, the difference from month to month (35.5 - 38.7 cm) is so small that it would be permissible to apply samples from one month to landings from another, or sooner to apply the mean length distribution for the year to the total landing for that year.

It is to be noted that the samples are by species (marinus and mentella), whereas the landings are only reported as "redfish".

Table 2 shows haddock for 3O and 4W. Only Canadian trawl samples, all commercial, are available, giving good monthly coverage and also good total coverage as the landings by Canada in the two divisions amount to 17/18 and 4/5, respectively, of total landings. It appears that the Canadian samples safely could be applied also to the small remaining U.S.A. landings. For Subarea 5 the other important haddock region, good coverage exists. It is to be noted that we do not know the size of the U.S.S.R. haddock fishery in the southern part of Subarea 3.

Table 3 presents the case for cod in 3L. The coverage is very low; for otter trawl only two commercial samples (both from June) covering only 2,000 tons out of a total of 35,000 tons. For pair trawlers there is no coverage; for dory-vessels only one sample, Portugal, Oct., before discard, 2,000 tons out of 11,000 tons; for long-lines two Canadian commercial samples (Sep.-Oct.), 500 tons out of 1700 tons. Only for the Canadian (NFLD.) small boat fishery does excellent coverage exist. The samples from this fishery supports the suggestion that traps be dealt with separately in the landings. The mean lengths for the four types of gear included in the small boat category are:

Long-lines: 64.9, 68.6, 69.2, and 69.5 cm.  
 Hand-lines: 57.8, 58.7, 62.1 and 63.9 cm.  
 Jigs: 55.6, 58.0, 59.5, and 59.5 cm.  
 Traps: 52.0, 55.4, and 57.1 cm.

The cod from the traps are thus considerably smaller than those from the hook fisheries.

The great differences in mean sizes - from 49 to 88 cm - of exploratory trawl samples show how dangerous it can be to apply such samples to the landings; however, to delete them will mean that the Summary Tables in this case would rely only on two samples (both from the same month) covering only ca. 2,000 out of 35,000 tons.

Table 3A gives an example of a calculation of total numbers of individuals of each length group for cod otter trawl 3L based on both commercial and exploratory samples. It is worth noting the great difference in the mean length (69.3 and 87.6 cm) for the two German exploratory samples from the same division, month and mesh-size, but from different depths. For the four U.S.S.R. samples, showing an even greater difference, no information on mesh-size or depth-range is given.

Table 4 presents for cod from the individual divisions of Subarea 1 the monthly landings by gear and country (Statistical Bulletin, Table 2) and the coverage by samples. The coverage is rather unsatisfactory. It is true that a fairly large amount of sampling is carried out in the subarea, but only a very small part is "commercial after discard". For preparation of Summary Tables from this subarea one would have either to establish a method for converting non-commercial samples to commercial samples, or to increase considerably the number of commercial samples, the latter probably by establishing a sampling in the home ports of the landed products (split or gutted, using the necessary conversion factors).

Summary of Points to Consider

1. Summary Tables as requested in the recommendation can be prepared for cod, haddock and redfish, but the reliability of their figures would vary.
2. The landing figures to be used will be those given in the Statistical Bulletin Tables 2,3 and 4, with the possible amendment that landings of cod from traps be separated from the other landings included in "Miscellaneous".
3. For the calculation of the landed numbers of individuals by length groups the following three alternatives could be applied:

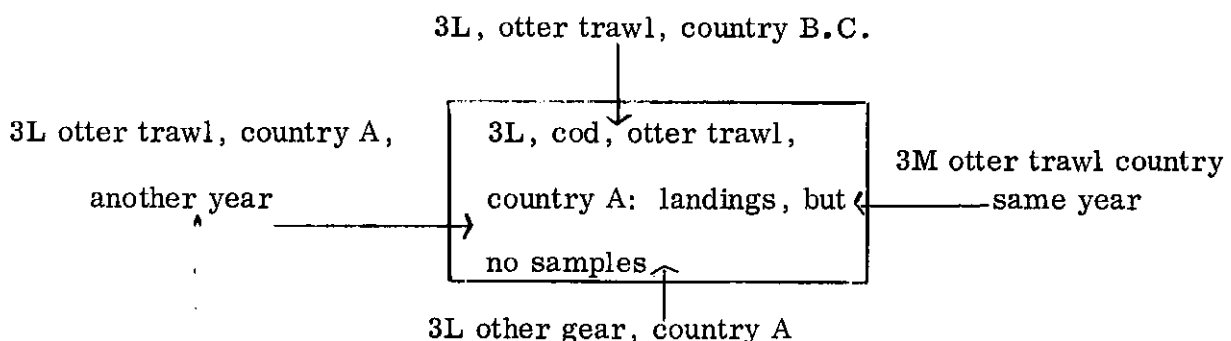
A. Landings:

- a. Totals by division and gear (right hand column in the tables).
- b. The individual totals for each month (horizontal lines).
- c. Landings by each country by division, gear and month (Table 8).

Which of a, b or c to use would depend on the coverage by samples; (a) would be the quickest and easiest method; (c) would, provided sufficient coverage by samples, give the truest figures.

B. Samples:

- I. Use of only commercial samples after discard, or,
- II. Supplementing these with commercial samples before discard and with exploratory and research samples.
- III. In case of II it is to be considered if and how these three categories of samples can be converted to commercial samples.
- IV. Provision of more complete coverage by commercial samples after discard.
- V. Consideration of what other samples to use for converting landing categories not already covered by samples (the number of such cases will increase from Aa to Ac). Here, a great number of possibilities exist; part of them are shown in the following diagram:



4. For the case of clarity it is suggested that for all samples reported, information be given whether measurements are made before and after discard, and of the mesh-or hook size used.

5. In order to keep the tables within a size and format handy for publication the Research Committee is asked to consider to what degree the groups of few individuals at the upper (small fish) and lower (large fish) end of the length distribution columns could be grouped together, e.g.:

Cod < 30 cm	Haddock < 20 cm	Redfish < 15 cm
> 120 cm	> 80 cm	> 60 cm
(3 cm groups)	(2 cm groups)	1 cm group
Total ca. 30 groups	ca. 30 groups	ca. 45 groups

6. As the landings of Sebastes are only reported as "redfish", the samples often as marinus and mentella, and as the length distribution of the two species differs (see Meeting Document No. 2), it should be decided in what way to establish an average length distribution to apply to the mixed regions (Subarea 2 and north eastern part of Subarea 3), taking into consideration the proportionate density of the two species.

7. According to a rough estimate the requested Summary Tables would take up about 25 printed or multilithed pages. It is to be considered whether the tables should appear in the Statistical Bulletin or in the Sampling Yearbook.

8. It could be considered to prepare similar Summary Tables of landings, but giving numbers of individuals by age-groups and year-classes; such tables would, over a series of years provide figures of the yield of the separate year-classes, total as well as by age groups. Table 5 shows an example (Cod, Subarea 1).

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TABLE 1. REDFISH

		3K OTTER TRAWL			5 Y OTTER TRAWL			
		Iceland	U.S.S.R.	U.K.	Total	U.S.A.		
a.		8908	11020	1	19929	Jan.	669	<u>C 21.7</u>
b.		1804	9153		10957	Feb.	663	<u>C 22.1</u>
c.			2257		2257	Mar.	1131	<u>C 25.7</u>
d.			10190		10190	Apr.	1184	<u>C 26.4</u>
e.		13832	19469		33301	May	1262	<u>C 26.0</u>
f.		6838	3871		10706	June	1703	<u>C 26.1</u>
g.		8928	9225		18153	July	1055	<u>C 26.0</u>
h.		4691	4380		9071	Aug.	1067	<u>C 26.4</u>
i.		2686	1477	9	4172	Sep.	1454	<u>C 28.1</u>
j.		4143	729		4872	Oct.	862	<u>C 25.1</u>
k.		1993	1222		3215	Nov.	868	<u>C 26.5</u>
l.		1878	5364		7242	Dec.	520	<u>C 27.0</u>
total:		55698	78377	10	134065	Tot.	12438	
		1) <u>Marinus</u> - 39.4	<u>Mentella</u> - 36.2					

TABLE 2. 4 W HADDOCK

Landings, tons, round, fresh.

	OTTER TRAWL				P. TRAWL	DORY V.	L. L.	SMALL BOAT	TOTAL
	Canada	Spain	USA	Total	Spain	Canada	Canada	Canada	
Jan.	2043		153	2196			127		2323
Feb.	1742		112	1854	13	66	48		1981
Mar.	4416	2	766	5184	108	168	95		5555
Apr.	4978		2896	7874	318	220	64		8476
May	571		270	841	13	3	12		869
June	447		8	455			2		457
July	424		141	565				245	810
Aug.	1029		201	1230				18	1248
Sept.	939		62	1001				248	1249
Oct.	1350		81	1431	18		2		1451
Nov.	972		49	1021	168		17	36	1242
Dec.	796		65	861			18	60	939
Total	19707	2	4804	24513	638	457	385	607	26600

30 HADDOCK

Landings, tons, round, fresh.

	OTTER TRAWL				Total	PAIR TRAWL	30
	Canada	Spain	U.K.	U.S.A.		Spain	TOTAL
Jan.	1942		37	7	1986		1986
Feb.	2276	3			2279		2279
Mar.	4706	1		13	4720	38	4758
Apr.	6815				6815	87	6902
May	1133	5			1138	81	1219
June	8	229	25		262	307	569
July		76			76	49	125
Aug.		4			4	87	91
Sept.	33	102			135	432	567
Oct.	64	19			83	332	415
Nov.	186	252			438	201	639
Dec.	32	8			40		40
Total	17195	699	62	20	17976	1614	19590

TABLE 3.

COD 3L 1959. Landings (in tons, round, fresh) and sampling (C-commercial, B-commercial before discard, E-exploratory (discard ?), R-research (discard ?)).

OTTER TRAWL										
	Canada, N & M-samples		France	Germany-samples	Iceland	Portugal	Spain-samples	USSR-samples	U.K.	Total
Jan.					8			38 E 79.8		46
Feb.				29				146 E 61.6		175
Mar.				66				214		280
Apr.	19		6901			3511	3561	123		14115
May	259		14			3892	491			4656
June	1028	C 65.9 cm	387			2206	1257 C 60.0	41 E 56.0	228	5147
July	570				177	91	382	168 E 49.3		1388
Aug.	180		21		2	4	48	137		392
Sep.	257		219			664	323	272		1735
Oct.	1312			345	106		47	1118	441	3369
Nov.	315		2119	254		24	165	27		2904
Dec.	10		410		8		289			717
Total	3950		10071	694	301	10392	6573	2284	669	34924

PAIR TRAWL DORY VESSEL				LONG-LINES			SMALL BOAT Inshore						
Spain	Canada	Portugal-samples	Total	Canada-samples	Norway	Total	Canada-samples						
								34					
								11					
								2					
		15	15					8					
		328	328	33		33	339	HL	LL	J	TR		
June	390	358	358	158		158	7695	C57.8,64.9,55.6,52.0					
July	936	565	1893	2458	249	249	43897	C58.7,69.5,59.5,55.4					
	228		3193	3193	568	568	20099	C63.9,69.2,59.5,57.1					
	26		2527	2527	324 C 65.3	189	324	8007	C62.1,68.6,58.0				
Oct.	1		1785 B63.0	1785	212 C 64.2		212	3609					
Nov.					14		14	594					
Dec.								81					
Total	1581	565	10099	10664	1558	189	1747	84376					

TABLE 3A. COD, 3L, 1959. Samples, Otter Trawl o/oo.

cm	Canada	Germany	Spain	U. S. S. R.				M. of all 8 samples (4)	Number of individuals landed in 1000's
	June Commer- cial	Sept. Explora- tory	June Commer- cial	Jan.	Feb.	June	July		
< 29						3	175	11	166
30-32			9			6	2 39	5	75
33-35		6	5			9	4 38	5	75
36-38			16			18	10 40	8	120
39-41	6	6	34			23	19 47	16	241
42-44	23	12 5	29			34	38 62	24	361
45-47	45	25 10	56			31	99 50	41	617
48-50	57	25 21	86			29	130 44	54	813
51-53	57	37 21	71	2		87	182 53	60	903
54-56	68	68 10	115	6		97	150 60	74	1114
57-59	79	93 10	76	13		117	86 74	69	1038
60-62	108	143 16	124	23		120	67 80	95	1430
63-65	97	106 26	119	29		121	57 83	88	1325
66-68	102	87 46	68	45		62	41 42	70	1054
69-71	94	44 46	65	60		59	37 34	62	934
72-74	61	87 26	29	89		52	29 17	48	723
75-77	49	44 52	29	125		31	14 13	44	663
78-80	27	12 46	31	143		21	7 11	33	497
81-83	18	44 31	9	117		22	- 7	26	392
84-86	17	31 62	10	108		18	2 6	27	407
87-89	16	12 36	6	91		11	5 5	19	286
90-92	14	- 72	4	63		4	4 4	18	271
93-95	10	25 103	3	49		1	4 4	23	346
96-98	9	25 93	1	15		4	4 2	19	286
99-101	11	25 77	3	12		6	4 3	18	271
> 102	33	43 191		10		12	5 7	43	647
No. of sam.	4	4 5	17						
Fish meas.	1029	161 194	3149	295	595	347	793		
ML. cm	65.9	69.3 87.6	60.0	79.8 <sup>3)</sup>	61.6 <sup>3)</sup>	56.0 <sup>3)</sup>	49.3 <sup>3)</sup>	66.5	
MW kg	2.90							2.32	
TW land Est.	713		1647 <sup>1)</sup>						
no.	246								15,058 <sup>5)</sup>
Mesh. fthm.	4" 37-85	110 mm 110-165	160 <sup>2)</sup> 110-280						

1) including pair trawlers;

2) new, dry;

3) M. of the 4 samples = 62.5 cm,

4) for Germany and USSR the means of their 2 and 4 samples were used.

5) The figure for total number of individuals is calculated from the total landings 34,934,000 kg and an estimated weight per individual of 2.32 based on mean lengths and mean weights as reported for samples from all gears in 3L in 1959.



SUBAREA 1  
**TABLE 4. COD. 1959.** Landings ( metric tons, round, fresh) and sampling  
 (C-commercial, B-commercial before discards, E-exploratory  
 [discard ?], R-research [discard ?]).

1A:

	SMALL BOAT	DORY VESSEL	TOTAL
May	Denmark	Portugal	1 A
June			
July	63	426	489
Aug.	100	560	660
Sep.	71		71
Oct.	3		3
Nov.			
Dec.			
Total:	237	986	1223

1B: OTTER TRAWL

	France	Germany	Norway	Portugal	Spain-samples	USSR - samples	U.K.	Total
May	1812			10	1866	1 E 62.5	429	4118
June	5810		87	2249	4222	E 65.9	230	12598
July	8	104	7			E 57.8		119
Aug.	1917		140	206	426 C 65.0 cm	E 66.8		2689
Sep.	12455			2077	2700 C 65.1	2 E 61.3	345	17579
Oct.	2899			84			441	3414
Nov.								
Dec.								
Total:	24891	104	234	4626	9214	3	1445 C no divisions	40517

	DORY VESSEL		LONG LINE		SMALL BOAT		TOTAL 1B:
	Portugal - samples		Norway - samples		Denmark - samples		
May					159	H.L.	4277
June	5738	B 64.7	93	H.L.	488		18917
July	14639	B 62.1			1750	R 56,56,62	16508
Aug.	11700	B 66.4	696	R 67.3	2565		17650
Sep.			764		1071		19414
Oct.			157		302		3873
Nov.					66		66
Dec.					3		3
Total:	32077		1710		6404		80708

TABLE 4: Continued.

1 C:

OTTER TRAWL								
	France	Germany	Iceland	Norway	Portugal	Spain - samples	USSR - samples	TOTAL
Jan.								
Feb.								
Mar.								
Apr.	47						2 <u>E 64.5</u>	49
May	514				152	127	1 <u>E 56.2</u>	794
June	621	<u>C 74.2</u>			2	335	10 <u>E 72.6</u>	968
July	47					9	3 <u>E 66.7</u>	59
Aug.				2		305	6 <u>E 70.9</u>	313
Sep.	47	<u>C 76.6</u>	5			60 <u>C 69.3</u>	18 <u>E 73.9</u>	130
Oct.	369		34		13	232		648
Nov.							6 <u>E 70.3</u>	6
Dec.								
Total:	1645		39	2	167	1068	46	2967

1C continued:

	PAIR TRAWL	DORY VESSEL	LONG-LINE	SMALL BOATS	TOTAL
	Spain	Portugal-samples	Norway-samples	Denmark-samples	1C
Jan.				8	8
Feb.				-	-
Mar.				2	2
Apr.				127	176
May				411	1205
June		1904 <u>B 70.4</u>	8	940 <u>R.P.N 69.2</u>	3820
July		3032 <u>B 71.0</u>		1886 <u>R.H.L.58.7</u>	4977
Aug.	1	2978 <u>B 68.5</u>	<u>R, HL, LL, 67, 75</u>	1262	4554
Sep.				428	558
Oct.			64	327	1039
Nov.				86	92
Dec.				113	113
Total:	1	7914	72	5590	16544

1 D :

OTTER TRAWL

	France	Germany-samples	Iceland	Norway - samples	Portugal-samples	Spain	USSR-samples	UK samples by months but not by divisions	TOTAL
Jan.								1172	1172
Feb.									
Mar.		190 <u>E 60.6</u>							190
Apr.	332	431 <u>E 64.0</u>		<u>R 68.1</u>	699 <u>B 63.9</u>	113	1 <u>E 62.0</u>		1576
May	925	1347 <u>E 69.4</u>	102	21	1195 <u>B 65.4</u>	1404	<u>E 66.7</u>	794	5788
June	271	4414		176	1030	34	4 <u>E 72.9</u>	548	6477
July	342	1729		3			3 <u>E 72.4</u>		2077
Aug.	157		7	84	80	1	4 <u>E 68.1</u>		333
Sep.	589	118	5	234	678	4	12 <u>E 73.9</u>	345	1985
Oct.	168	16	50	66	496	94			890
Nov.							1 <u>E 69.1</u>		1
Dec.		<u>E 69.9</u>						416	416
Total:	2784	8245	164	584	4178	1649	24	3275	20

TABLE 4. Continued

1 D continued:				
	DORY VESSELS Portugal - samples	LONG-LINE Norway - samples	SMALL BOAT Denmark - samples	1D TOTAL
Jan.			141 HL. LL.	1313
Feb.			99	99
Mar.			89 R <u>58.2</u>	279
Apr.		30 R H.L. <u>64.1</u>	358 R <u>50.7</u>	1964
May		84	1947	7819
June	2901 B <u>70.3</u>	133	993 R <u>77.9</u>	10504
July	4030 B <u>72.7</u>	46 R B.L.L. <u>79.1</u>	486 R <u>68.3</u>	6639
Aug.	1959 B <u>74.0</u>	114 R H.L. <u>74.0</u>	321 R <u>61.4</u> <u>77.1</u>	2727
Sep.			147 R <u>72.3</u>	2132
Oct.		52	165 R <u>71.6</u> <u>55.7</u> <u>77.9</u> <u>76.7</u>	1107
Nov.			133 R <u>72.9</u>	134
Dec.			130	546
Total:	8890	459	5009	35263

1 E: OTTER TRAWL									
	France	Germany- samples	Iceland	Norway- samples	Portugal- samples	Spain	USSR samples	U.K.	TOTAL
Jan.									
Feb.									
Mar.									
Apr.				R <u>72.2</u>	35	30	E <u>62.5</u>		65
May	768			62	5261 B <u>65.8</u>	806	E <u>73.2</u>	429	7326
June	288	C <u>72.8</u>		55	1858	845	E <u>74.7</u>		3046
July			23				E <u>59.3</u>		23
Aug.			25				E <u>46.5</u>		25
Sep.			57						47
Oct.									
Nov.		31					E <u>57.4</u>		31
Dec.		342 E <u>45.3</u>							342
Total:	1056	373	95	117	7154	1681		429	10905

1 E continued:

	LONG-LINE	SMALL BOATS	TOTAL 1E
	Norway-samples	Denmark-samples	
Jan.		113	113
Feb.		76	76
Mar.	H.L. BL.L.	15	15
Apr.	27 R <u>67.8</u> <u>72.3</u>	55	147
May	783	493	8602
June	809 BL.L.	620	4475
July	11 R <u>80.3</u>	865	899
Aug.		761	786
Sep.		289	336
Oct.	25	230	255
v.		193	224
c.		57	399
Tot:	1655	3767	16327

TABLE 4 continued:

1 F: OTTER TRAWL							
	France.	Germany	Iceland	Portugal	Spain	U.K.	Total
Jan.		897				1180	2077
Feb.		1277				168	1445
Mar.							-
Apr.	3			320	88		411
May				423	8	426	857
June						752	752
July			9				9
Aug.		114	16				130
Sep.		229 <u>C 68.2</u>	69			299	597
Oct.		38 <u>E 73.0</u>	76			465	579
Nov.		31				933	964
Dec.		<u>E 60,C 67</u>				2840	2840
Tot:	3	2586	170	743	96	7063	10661

C-no divisions

1 F: continued:

	PAIR TRAWL	LONG-LINE	SMALL BOAT
	Spain	Norway	Denmark
Jan.			83
Feb.			76
Mar.			129
Apr.	13	2	227
May		131	267
June			577
July			962
Aug.		<u>BLL.R 72.4</u>	1479 <u>HL R 62.5</u>
Sep.		75	1198 <u>HL R 58.0</u>
			<u>68.4</u>
Oct.		127	1016 <u>HL R 62.5</u>
Nov.			317
Dec.			239
Tot:	13	335	6570

APPENDIX ON  
AGE SUMMARY TABLES AND CONCLUSIONS

The recommendation quoted above calls for "summary tables giving the total numbers of fish of each length" etc.

When examining the feasibility of producing such tables one is naturally led to the question of similar tables, but giving the data by age-groups and year-classes. Such tables would, over the years, provide the yields, total or by age-groups, of the different year-classes. The problems met in producing such tables are more or less the same as for the producing of the length-tables.

An example of a table of this kind is shown in this appendix; it gives for Subarea 1, cod, otter trawl 1959, all countries, the landings by age-groups and year-class expressed in tons and in thousands of individuals.

CONCLUSION

The preparation of "Summary Tables" based on the length -and the age distribution is possible.

Some minor problems (see the preceeding Summary) have to be considered and decided on: which gears or groups of gears to consider separately and how to apply the samples available to the different landings.

Besides these are some basic problems to consider:

A. The recommendation calls for summary tables of fish caught, but the preceding calculations are all based on landings, i. e. catch minus discards, for the simple reason that we do not know the amount caught, nor the amount discarded. The purpose of the "Summary Tables" no doubt is to give the numbers of fish taken away from the stocks by the fishery, and not the numbers brought to the market, i. e. the actual catch and not the landings. The question to consider here is whether the landing figures are so close to the catch figures, that we without impairing the results can use them or whether by some means or other the landings could be converted to catch. An additional problem here is to what extent the fish discarded are able to survive, i. e. are in fact returned to the stock. It is to be hoped that the reports by countries on discards now requested can provide some answer to these questions.

B. The other, and related, problem is what kind of commercial samples should be used - either before or after discard. As the purpose of the "Summary Tables" obviously is to give information on the effect of the fisheries on the stock, and as we no doubt are safe when assuming that most fish discarded are not surviving, commercial samples before discard would be preferable. As most commercial samples are reported as after discard, and as such samples are the most easy to provide, it could be considered to define methods for counting from after discard to before discard. Again here the question arises how large, how important, are the discards.

---ooOoo---

Appendix, Table. Cod, 1959. Subarea 1. Calculations of landings by age-groups and year-class in tons and in '000 of individuals. Otter trawl fishery based on Faroese (commercial) German (exploratory) and Portuguese (commercial before discard) samples. The mean length in cm is calculated from German and Portuguese OT samples (exploratory and commercial), from Portuguese dory samples (before discard) and from Norwegian research samples (O.T., H.L. and L.L.). For samples with the larger fish reported in one group, this has been divided into 3-cm groups in the proportion of samples with the larger fish separated into 3-cm groups.

Year-class	Age-Yrs.	0/00 age distribution of samples:											
		Faroese			Germany				Portugal				
		1D May	1E May	1C Sep.	1D Mar.	1D Apr.	1D May	1E June	1F Sept.	1F Dec.	1D Apr.	1D May	1E May
1956	3							7			5		23
1955	4	27	13		2	3		1	7	1	55	20	70
1954	5	30	16	10	212	15	10	3	11	5	95	85	48
1953	6	630	456	245	710	785	438	305	463	581	618	628	399
1952	7	154	122	73	29	87	198	97	168	138	192	131	98
1951	8	57	93	91	16	46	83	129	93	71	20	65	88
1950	9	69	192	202	16	19	121	226	171	158	15	45	126
1949	10	10	18	15	1	12	7	18	57	27		5	18
1948	11	2	14	74	3	5	8	34	3	2		5	25
1947	12	17	55	157	4	13	61	151	10	9		15	70
1046	13		7	5	2	4	13	10	2	2			16
1945	14		4	74	1	6	22	13	2	2			15
1944	15		5	31	1	1	20	7	1	1			3
1943	16		3	11	1	1	9	3	1	1			
1942	17		1	3	1	1	3	1	1	1			
1941	18		1	3			3	1	1	1			
1940	19					1	2						
1939+	20+	2		6	1		2	2	1	1			
No. of samples		2	8	1	1	1	1	2	1	1	2	2	4
No. of individ.		403	1151	190	419	174	186	380	178	227	199	199	396
Mean age											6.5	5.9	7.3
Fish size				110	110	110	110	110	110	110	117	117	117
Range fthms.											33-36	33-35	116-167

Appendix, Table, Cod, 1959. Subarea 1 Continued:

Year-class	Age-Yrs.	Sum of o/oo of all 12 samples	Mean length in cm	Mean indiv. weight kg <sup>1)</sup>	Sum of o/oo X by Mean weight kg	Landings in tons by age groups <sup>2)</sup>	Landings in individuals in 'ooo by age-groups <sup>3)</sup>
		a	b	c	d	e	f
1956	3	37	42.6	0.7	26	82	117
1955	4	199	48.6	1.2	239	750	625
1954	5	540	56.9	1.7	918	2880	1695
1953	6	6258	64.5	2.4	15019	47115	19631
1952	7	1487	68.9	2.8	4164	13069	4668
1951	8	852	74.3	3.6	3067	9621	2673
1950	9	1360	77.5	3.9	5304	16639	4267
1949	10	188	79.5	4.3	808	2535	585
1948	11	175	79.8	4.6	805	2625	571
1947	12	562	80.9	4.7	2041	6403	1363
1946	13	61	83.4	5.1	311	976	191
1945	14	139	85.7	5.5	765	2400	437
1944	15	69	86.5	5.6	386	1211	216
1943	16	30	87.9	5.7	171	536	94
1942	17	12	89.5	6.1	73	229	38
1941	18	12	89.2	6.0	72	226	38
1940	19	3	95.7	7.6	23	72	9
1939+	20+	15	113.0	13.0	195	612	47
		11999			34587	107981	37265 Mean W. 2.9kg

1). After "Assessment Report: App. III, Table 1."

2). Tot. O.T.-Landings reported: 108,494 tons; calculated from 108,494 divided by 34,587 = 3.137

3). Calculated as e divided by c.