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Exploration of the Sea

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Administrative Report

H e r r i n g C o m m i t t e e

By G. HEMPEL

Belgium

(Ch. Gilis)

Campaign 1965-66

Owing to very irregular and poor catches, it was not possible to collect any study material nor to carry out the usual biological observations.

Denmark

(K. Popp Madsen & Aa.J.C. Jensen)

Inner Danish Waters (Skagerrak, Kattegat, Limfjord, Belts and Baltic)

Many samples from commercial catches were analysed at the laboratory for size, age, maturity and racial characters.

North Sea and Skagerrak

In February and November-December 1965 research work was carried out by "Dana" in the Skagerrak and the north-eastern North Sea from the Skaw to Bergen.

The distribution and composition of herring shoals were traced by sonar, echo-sounder and fishing with herring-bottom trawl and one-boat pelagic trawl in connection with environmental studies mainly comprising the hydrographic conditions and the distribution and composition of the most important herring food organisms.

The central North Sea herring fisheries were followed by market-sampling and by collecting detailed catch statistics in Esbjerg.

Faroes

A few samples were collected from the spawning sites on the Faroe Bank.

Greenland

Apart from occasional samples for measurements, no work on herring was carried out in 1965.

Finland

(V. Sjöblom)

During May and June 1965 catch statistics and hydrographical, chemical and plankton samples were collected in the pre-spawning and spawning areas of the Baltic herring, in the Gulf of Finland.

During August samples of Baltic herring and sprat were collected with a mid-water trawl by the "Aranda" from the open-sea area of the Bothnian Sea,

the northern Baltic proper and the Gulf of Finland; 22 samples of herring and 22 of sprat were taken.

In all 3502 Baltic herring and 3362 sprat were analysed as to length, weight, maturity and age.

France

(Cl. Nédélec)

Les observations habituelles ont été faites par l'Institut des Pêches sur l'âge, la taille, la maturité sexuelle et la moyenne vertébrale des harengs du Pas-de-Calais ainsi que sur ceux de la région du Dogger Bank et de Whitby. Dans la première région le stock se composait surtout de harengs de 3 ans alors que dans les autres ce sont ceux de 4 ans qui dominaient.

Des essais de pêche ont également été faits avec la "Thalassa" en octobre, d'abord dans le Skagerrak avec un chalut pélagique, sur le Gut et au Dogger Bank, ensuite avec un chalut semi-pélagique.

Germany

(G. Hempel)

In 1965 F.R.S. "Anton Dohrn" made two cruises for adult herring investigations in the North Sea and the Skagerrak. The first cruise, from 11.8.65 to 9.9.65 included the area between 54°-60°N and 7°E-2°W; the second, from 20.11.65 to 16.12.65 was carried out into the N.E. North Sea and the Skagerrak. On these cruises herring populations and their distribution in relation to the hydrographical conditions of the area were studied.

The investigations of the herring populations in different areas of the North Sea and adjacent waters were continued along the same lines as previously. For the first time did in November also investigations on the Atlanto-Scandian-stock in their over-wintering area east of Iceland start.

129 samples containing 12 905 herring from the sea and the markets were analysed. Measurements were made of 54 469 herring.

As in the previous years the composition of oil-herring catch was studied at the Institut für Küsten- und Binnenfischerei. 10 random samples of 3 923 fish (= 130 kg) were analysed as to their species and length composition. Also the investigations which are to assess the number of juvenile herring caught as by-catch in the German shrimp fishery, were continued at the Institut für Küsten- und Binnenfischerei. A total of 429 samples of shrimp catch were taken on various fishing grounds and throughout the fishing season (March-December).

The distribution of herring larvae and their relation to light conditions were examined during two cruises of F.R.S. "Anton Dohrn" in January (Southern Bight and eastern English Channel) and September (Aberdeen Bank).

Iceland

(J. Jakobsson)

1. Surveys

The winter-herring surveys were carried out on a 120 ft converted fishing boat the "Hafthór". The surveys started in early January and finished in early March. The main objective was the winter migrations of the Icelandic herring stocks. The "summer" surveys off the east and north coasts began on May 7th and were continued right through the summer and autumn to the end of the year. These surveys were carried out on the "Ægir", the "Hafthór" and a third chartered 120 ft vessel. The main purpose of these surveys were the summer-feeding migrations of the Icelandic and Norwegian herring stocks as well as a study of their movements in the over-wintering areas during the last three months of the year.

2. Sampling

Sampling was carried out both at the main laboratory in Reykjavik as well as at annex laboratories at Siglufjörður on the north coast and Neskaupstaður on the east coast. As in previous years the following measurements and analyses were carried out: Length, weight, intestinal fat, stage of maturity and weight of gonads, vertebral counts and age-determination. The sampling at various seasons and areas is shown in the following table:

Season	Area	Number of samples	Number of individuals
Winter and spring	south coast	10	902
Summer and autumn	north and east coasts	57	5626
Summer	south coast	9	813
Autumn	south coast	10	998

3. Tagging

Herring tagging was carried out by internal tags only. The following table shows the number of herring tagged in each of the 5 tagging experiments:

Month	Area	Category	Number
January	south-west	Immature	1900
May	south-west	Adult	2250
May	north-west	Immature	1450
July	east	Adult	999
July	south-east	Mixed	3098
Total			9697

Ireland

(F.A. Gibson)

Herring investigations were continued at Dunmore East where 2,712 fish were examined for length, sex, maturity, vertebral count, age, nuclear type and fat content. Catch per effort for the various types of gear and mortality were also determined.

Netherlands

(J.J. Zijlstra)

In the period July-December an extensive sampling programme was carried out on herring caught in the north-western North Sea (July-August), in the central North Sea (August-October) and in the Southern Bight (November-December).

From the driftnet-fishery in the southern North Sea in October-November samples were collected in collaboration with the English laboratory. Three cruises of the "Willem Beukelsz" were allotted to larval surveys on the Dogger Bank-Whitby grounds in October, the West Bank - Jutland Bank in November and on the Sandettie-Channel grounds in December. Two cruises were made in southern North Sea in November-December with the purpose of tagging herring.

Norway

(O. Dragesund)

Sampling

During 1965 the routine sampling of biological data from the various fisheries were continued on the same general lines as in the previous years. From the fisheries on adult Atlanto-Scandian herring, the winter-herring fisheries and summer fisheries in the Norwegian Sea, altogether 50 samples containing 4640 herring were secured.

From the small and fat herring fisheries mainly off northern Norway 19 samples containing 1835 herring were examined.

Also 18 samples, altogether 2240 individuals were examined from the Norwegian herring fisheries in the Skagerrak and North Sea area.

Cruises

From 15 January to 27 March the spawning migration of herring from the wintering areas off Iceland was followed with R.V. "Johan Hjort". The location of the herring shoals were reported daily to the fishing fleet. As in 1963 and 1964 it was also possible to follow the immigration of spawning herring to Lofoten from the northern Norwegian waters.

After the spawning season a cruise was undertaken from 29 March to 14 April (R.V. "G.O. Sars") in order to study the abundance and distribution of herring larvae near to the spawning grounds between Stad and Lofoten.

From 25 May to 25 June "G.O. Sars" took part in the joint investigations in the Norwegian Sea and Icelandic waters where herring distribution were studied in relation to plankton and hydrographical conditions.

Again from 22 July to 17 August a survey of herring in relation to temperature was studied on a cruise with "G.O. Sars" from northern Norway to Jan Mayen and Bear Island.

For assessment of year-class strength and the distribution of O-group herring along the coast off northern Norway and in the Barents Sea, a cruise was made with "G.O. Sars" and "Johan Hjort" from 24 August to 17 September in collaboration with two Soviet research vessels.

The distribution of herring in the Skagerrak and North Sea during late autumn was charted on a cruise with "Johan Hjort" from 18 October to 10 November.

From 22 November to 18 December a survey was made with "Johan Hjort" off the coast of northern Norway in order to locate the wintering grounds of the herring spawning in Lofoten.

As in previous years the hydrographical condition between the Norwegian west coast and the wintering areas east of Iceland was investigated before the spawning migration starts. The cruise was undertaken from 5-18 December with "G.O. Sars".

The investigation on immature herring in the fjords of northern Norway were also in 1965 carried out in collaboration with Tromsø Museum using the R.V. "Asterias" about 125 days during the year.

Tagging

Tagging experiments were carried out during the winter-herring fisheries. For various reasons only 700 herring were tagged with internal tags.

In November 4000 herring were tagged with internal tags on two localities in Skagerrak.

Poland

(J. Popiel)

I. North Sea

Material on the composition of commercial catches were collected on the mother ship "Pułaski".

The samples were taken mainly from the area Farn Deeps - Dogger Bank and from the north-eastern North Sea. In all 35.183 herring were measured and 6.331 analysed in respect to age, sex, weight, state of gonads and otolith characters.

II. Baltic

The routine investigations were continued. The main regions of investigation were the Gulf of Gdańsk and the Bornholm Bassin. 10 samples were taken from the coastal catches of spawning herring in different places along the Polish sea coast. 11 samples contained small herring for recruitment study and 18 samples were taken from off-shore trawl catches.

Altogether 20.432 herring were measured of these 3.336 were examined for age, length, weight, sex and maturity.

Sweden

(G. Otterlind)

Near Northern Seas' Area (H. Höglund)

In total 32 samples have been examined comprising about 8000 fish, from the following areas: North Sea and outer Skagerrak, 14 samples; Inner Skagerrak and northern Kattegat, 11 samples; Inshore waters of inner Skagerrak, 7 samples.

Baltic (G. Otterlind)

In the Stockholm archipelago 800 herring were tagged with Lea tags in May. From the Bothnian Sea and Baltic proper 13 samples were examined comprising 2210 fish.

United Kingdom

I. England

(D. Cushing)

During 1965 14,452 herring were measured at North Shields and 21,620 at Whitby. At the East Anglian ports of Lowestoft and Yarmouth 30,504 herring were measured and at Milford Haven 5,875 herring from the Dunmore Fishery were also measured. The following numbers of fish were examined for age, length, maturity, V.S. and in addition K_2 counts and otolith characters were examined for the spawning fish.

Fishery	No. of herring examined
Dunmore	606
North Shields	3100
Longstone	200
Whitby	354
Haisboro'	1200
East Anglia	600
Hinder	905
Barra Head	100

Three tin-tow-net surveys to ascertain the distribution of herring larvae were carried out in the southern North Sea and English Channel in November and December. Two surveys of the distribution of young herring in the North Sea were made during the year, one in March and the other in September. Scales and otoliths from 1800 fish were collected from the March trip and herring samples were obtained from the Egersund Bank area. In September poor catches of herring were made over the western Dogger region and when the areas east of the Dogger were worked very few herring were caught.

A cruise was made along the English east coast in July to obtain beach seine and trawl samples of 0-group herring. Large numbers of 0-group herring were caught at Scarborough, south of Flamborough Head, however, 0-group herring were caught in only small numbers while sprats were taken in large numbers in most of the hauls. A cruise was also made to the Solway Firth in May in order to sample 0-group herring.

In August a cruise was made to the west coast of Scotland. A trawl survey started on 26th August and almost all the fish shoals located by echo-sounder were small and scattered. During the trawl survey approximately 1300 herring were examined. The majority were again found to be autumn spawners but in some samples up to 25% of spring spawners were present. Some young herring larvae were taken off Cape Wrath on 5th September. In October a herring-larval survey was made to the west coast of Scotland. During the cruise tests were carried out in order to determine the stratification of larvae by day and night.

In November an echo-survey was carried out and fish counting was done with the 30Kcs and 100Kcs units. The main area surveyed extended between the Galloper-Hinder regions and south to Sandettie. No fish concentrations were located and there was an almost complete lack of trace in the West Hinder-Fairy Bank and Sandettie-Ruytingen areas.

II. Scotland

(B.B. Parrish & A. Saville)

Routine statistics collection and sampling of the Scottish adult herring fisheries in the northern North Sea and off the Scottish west coast (Minch and Clyde) were continued in 1965 along the same lines as in previous years. The routine statistics and the length, age and meristic character data collected are being prepared for publication in Annales Biologiques, Volume 22, and in the Statistical News Letters.

Sampling was also conducted in the fisheries for immature herring in the Moray Firth and Firth of Forth and this was supplemented by research-vessel trawling surveys of the immature herring of the Moray Firth at intervals throughout the year and in the central North Sea in autumn. Data from these surveys are being used to study recruitment to the adult stocks.

Studies of larval production and dispersal were continued in 1965 in the Clyde in spring and in the north-western North Sea in autumn with associated hydrographic observations of temperature, salinity and water movements. In the Clyde these studies were preceded by grab and aqualung diver observations on a patch of eggs on Ballantrae Bank to study its extent, the density of eggs and the rate of development. Surveys of larval distribution were also made in the Minch and to the west of the Hebrides in autumn to locate the spawning grounds of the autumn-spawning herring of this area.

The programme of fecundity studies on herring in maturity stages III-V in the north-western North Sea was continued to provide data on the proportion of 'Banks' and 'Downs' herring in the summer feeding concentrations. Associated serological and biochemical studies were also continued with a view to identifying herring genotypes in the North Sea.

Studies of the relations between herring distributions and environmental factors in the northern North Sea in summer were continued in collaboration with the Oceanographical Laboratory of the Scottish Marine Biological Association.

Comparative fishing experiments were made in the north-western North Sea to determine the relative catching capacities and selectivities of drift nets of polypropylene and nylon twines of different colours.

Associated with this the visibility of netting of different colours was investigated by direct underwater observation in the northern North Sea and in the Mediterranean.

Tank experiments were continued on the reactions of herring to sound and visual stimuli.

In February-March a tagging experiment was carried out on spawning herring in the Clyde during which 1300 herring were tagged and released.

In September a herring-trawling survey of the area to the west and south of the Hebrides was made by F.R.S. "Explorer". The data collected on this survey are being prepared for publication in Annales Biologiques, Volume 22.

U.S.S.R.

(S.S. Fedorov)

During 1965 the Soviet research institutes (VNIRO, PINRO, AtlantNIRO) continued to study the state of stocks, distribution, behaviour and life conditions of adult Atlanto-Scandian, White Sea and North Sea herring. Investigations on the efficiency of spawning and on the distribution and abundance of larvae and young herring in the Norwegian and North Seas were also conducted.

In December 1965 a regular echo-survey of the stock of the Atlanto-Scandian herring was made in their wintering area. Sub-marine photography was also used. Investigations on the distribution of herring and on environmental conditions in the Norwegian Sea were carried out in June by PINRO together with Norwegian and Icelandic scientists.

In September PINRO (in co-operation with the Norwegian scientists) investigated the distribution and abundance of the 0-group herring and of other fish species in the Barents Sea and the eastern part of the Norwegian Sea.

A number of scientists from research institutes were engaged in field studies carried out on board the vessels of PINRO and AtlantNIRO.

In the course of the cruises much material on the age and size composition of herring concentrations, on their fecundity and maturation was collected. 370200 herring were caught in the Norwegian Sea for length measurements, 15458 in the Barents Sea, 5300 in the White Sea and more than 23000 in the North Sea. For age determinations 18850, 1921, 948 and 1144 specimens were taken in the Norwegian, Barents, White and North Seas, respectively. The material collected is now being worked up.

Some conclusions can be drawn from this research work:

1. The Atlanto-Scandian herring stock which mainly consists of the 1959 and 1960 year-classes, is in good condition, but from 1967 a reduction in their abundance is to be expected.

2. The yields of the Norwegian herring born in 1965 are poor.

3. In the north-eastern part of the North Sea the 1960 (autumn-spawning herring) and the 1959 year-classes made up most of the catches.

Eleven papers within the scope of the Herring Committee were published in 1965.