INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES
Dalhousie University,
Halifax, Nova Scotia, Canada.

Serial No. 1149 (D.b.)

Document No. 77

ANNUAL MEETING - JUNE, 1963

Report On Researches Carried Out And The Status Of The Fisheries In Subarea 3

By: W. Templeman

Reports on researches in 1962 were submitted by the following member countries: Canada (Doc. 13), France (Doc. 44), Germany (Doc. 7), Portugal (Doc. 72), Spain (Doc. 39, 40, 41), USSR (Doc. 54, 56, 59, 60, 61, 64), United Kingdom (Doc. 19, 20, 30).

1. Work carried out

(a) CANADA: "A. T. Cameron" and other research vessels. Surveys of cod, haddock, redfish and American plaice abundance and size in relation to location, depth and temperature. Sampling of research catches for age and sexual maturity. Sampling of commercial offshore catches of the above species throughout the year and of inshore catches of cod in summer and autumn. Survey of inshore distribution of young cod (Sept.-Oct.). Cod tagging. Five hydrographic sections across the Labrador Current and continental shelf (July-Aug.). Study of hydrography of deep water south of Grand Bank (Feb.-March and July).

(b) FRANCE: "Thalassa" survey cruise including St. Pierre Bank and Burgeo Bank.

(c) GERMANY: "Anton Dohrn" Fish survey, especially cod, and hydrography, 3M and 3K, Feb. 23-27.

(d) PORTUGAL: Sampling of cod catches from dory vessels in 3L, 3N and 3O.

(e) SPAIN: Sampling of cod catches from commercial trawlers in 3K, 3L, 3M, 3O and 3Ps (March-Nov.) and from pair trawlers in 3Ps (Feb.) and 3L (Sept.)

(f) USSR: Surveys on distribution of zooplankton, pelagic eggs and larvae and young of commercial fishes and redfish distribution and size and sex with depth. Cod tagging. Collection of data on age, length, maturity, food and races of the major commercial fishes.

(g) UNITED KINGDOM: "Ernest Holt" worked St. John's - Flemish Cap hydrographic section, Dec. 4-6. Market sampling and cod, haddock, redfish and pollock sampling in factory ships. Continuous Plankton Recorder surveys.

2. Hydrography

In the 5 Canadian hydrographic sections taken July 24 - Aug. 20 by the "Investigator II" from off Bonavista to the southern Grand Bank, surface temperatures were lower and bottom temperatures over the Grand Bank higher than in 1961.

...../2

2. Hydrography (Cont'd)

In the United Kingdom (Ernest Holt) repeat of the St. John's Station's Flemish Cap - Grand Bank section, Dec. 4-6, compared with the St. John's Station's July section there was still Labrador Current water below 0°C in the eastern slope of the Grand Bank and over the bottom of the northern Grand Bank and Avalon Channel and below -1°C near the coast. (It is noteworthy that in the more northerly subarea 2 section from Seal Island - Hamilton Inlet Bank taken on Nov. 26-27 there was no water with a temperature below 0°C although water with a temperature as low as -1.4°C was present in August.) Surface temperature west of Flemish Channel had fallen considerably especially over the eastern slope of the Grand Bank where there was considerable upwelling of cold water. There was little change in temperature in the Flemish Cap area apart from slightly reduced surface temperatures.

Hydrological investigations by USSR show that in the first half of 1962 water of polar origin occupied less space than usual, temperatures in the 0-50 m layer being about the same as in the warm year of 1958. Near the end of August the onflow of the cold Labrador Current intensified to the extent that by the end of the year the sea off Labrador was colder than at the end of 1961. The analysis of long-term data shows that in most cases the temperature and salinity in the near-bottom layers (below 200 m) undergo very little variation.

3. Plankton

The USSR carried out studies of the quantitative distribution and of the seasonal variations in zooplankton. The boreal zooplankton and especially Calanus finmarchicus are the basic zooplankton source of fish food in the area. The zooplankton biomass in summer is considerably higher than in spring and autumn. Phytoplankton blooms and the ensuing zooplankton biomass increase begin on the southern part of the Grand Bank in March-April and gradually occur more northerly until by August the development reaches the Labrador coast.

The United Kingdom carried out surveys with the Continuous Plankton Recorder.

4. Fish eggs and larvae

The USSR reported on surveys of eggs and larvae of cod, redfish, haddock, American plaice, Silver hake, sand eels (launce) and the lemon sole, Microstomus microcephalus. The latter species has not, up to the present, been reported from Northwest Atlantic.

The United Kingdom has reported the information on redfish larvae obtained from the Continuous Plankton Recorder surveys of 1962.

5. Cod

The Canadian inshore landings were above those of 1961. In traps 80-95% of the cod were 4-7 years old. Cod of the handline and jigger fishery were mainly 5-7 years. Older cod were of little significance in the trap fishery, a little more important in the handline and jigger fishery and still more important to the longline fishery especially in deep water. The 1957 year-class has proved to be a successful one in the inshore area. The beach-seining survey for baby cod indicates that the 1962 year-class may be a successful one in inshore waters as was indicated previously for the 1959 year-class which is now appearing as a numerous year-class in the trap fishery. In survey cruises to the southern Grand Bank in February, May and October and to St. Pierre Bank in May cod catches were generally small. Cod tagging was resumed; the last tagging experiments were in 1955.

Germany reported length frequencies for 3K and 3M in February from "Anton Dohrn" surveys with small-mesh liner in codend. In 3K the average length was 44 cm with 50% of the catch between 40 and 50 cm. In 3M about 60% of catches were 2 year-olds ranging from 17-26 cm in length.

......./3

5. Cod (Cont'd)

Portugal reported on sampling operations on board dory vessels in 3L, 3N and 3O, including size and age composition, weight, sex ratio, stage at maturity and first spawning. In 3L (Sept.) the size distribution was unimodal with size range of 40-73 cm, a peak at 46 cm and mean length 52 cm. In 3N (Sept.) sizes varied between 40 and 130 cm, peaks at 52 and 73 cm and mean length 67 cm. In 3O (May) the distribution was multimodal, the range being 43-121 cm and mean length 81 cm.

Spain carried out studies of length composition of catches, age, growth, sex, and age at maturity of cod on otter trawlers. It was concluded that the growth curves of cod from 3K and 3L showed a decrease in growth rate compared with those of preceding years. Similar observations were carried out on pair trawlers, and in addition observations on bottom temperature, discards, conversion factor, length-girth relationship, stage of sexual maturity and feeding. It was concluded that average catches by pair trawlers were decreasing, and that the conversion factor from landed salt cod to round fresh weight is 2.7 for pair trawlers compared with 3.0 used for otter trawlers. An excellent description is given in Doc. No. 41 of Spanish pair-trawling and the trawl itself.

The USSR cod catches during the winter and spring in 3K were dominated by 53-65 cm fish in winter and 41-56 cm fish in spring. Most important in the catches were cod of ages 4-8 of 1954-58 year-classes. On Flemish Cap (3M) cod formed stable concentrations on the southeastern part of the bank in winter and on the southwestern part in spring at depths exceeding 300 m. The catches consisted mainly of 45-62 cm fish of ages 5, 6, 8 and 9, with the rich 1957 year-class (age 5) being dominant. The growth rate in 3M is higher than in 2J and 3K but lower than in all other divisions of the subarea.

The USSR reported on cod tagging in 1960-62. Cod tagged on northern St. Pierre Bank showed a summer migration to the northeast of Newfoundland coastal areas similar to that found in previous Canadian tagging. A few recaptures also indicated a summer coastward migration to the Newfoundland coast from the offshore deep-water areas on the seaward part of the Northeast Newfoundland Shelf.

The USSR also reported on surveys for young cod (up to 35 cm). The largest concentrations of young cod, especially 0-group, were found on the southern slopes of St. Pierre Bank and Green Bank and on Flemish Cap at depths of 150-200 m.

6. Haddock

Canada carried out haddock surveys on the southern half of the Grand Bank in February and May and on St. Pierre Bank in May. The best catches were obtained on the southwestern slope of the Grand Bank in 125-160 fathoms at bottom temperatures of 4 to 5° C. In February unusually high temperatures (8 to 10° C) were present at many of the fishing stations on the southwestern slope of the Grand Bank in depths of 65-85 fathoms. One catch (300 kg) mainly of 1-year-old haddock averaging 19 cm in length was obtained on the Grand Bank in May and two similar catches of haddock averaging 21 cm in length from St. Pierre Bank. From the February survey on the Grand Bank the 1955 and 1956 year-classes accounted for 60% and 15% respectively of the research vessel catches. The commercial fishery is still almost entirely dependent on the 1955 and 1956 year-classes, there being poor recruitment of younger ages to the fishery.

The USSR researches in February show a predominance of haddock of sizes 38-42 cm on the Grand Bank at 150-200 m. with near-bottom temperatures being 5-7° C. No large haddock concentrations were found in their usual places during spring and summer, when the near-bottom temperatures along the southwest slope of the Grand Bank down to 300 m never rose above 4°C. By the end of August bottom temperatures increased to exceed 4°C and haddock approached the shallow water areas to feed on capelin eggs and Amphipoda. At this time the catches by research vessel with small mesh trawl were dominated by fish of 40-44 cm and

...../4

6. Haddock

24-26 cm, the latter group being attributed to the 1961 year-class. Haddock of 20-28 cm were present in considerable numbers on St. Pierre Bank. In January, 1963 a survey of the Grand Bank for young haddock was carried out, and 200 1-year-old fish mainly 15-17 cm in length were taken in a one-hour haul at 155-165 m. on the southwest slope.

7. Redfish

Canada carried out a redfish survey of the southwestern slope of the Grand Bank (down to 400 fathoms) in October. The best catches (1100-2200 kg) per 30-minute haul were obtained at depths between 125 and 250 fathoms. In the area the usual trend of increase in size of redfish with increase in depth was noted for both males and females. The redfish, as are typical in this area, were small, the fish taken in the good catches at 250 and 300 fathoms being the largest with an average weight of about 0.5 kg. All redfish taken during the cruise (except one Sebastes marinus) were S. mentella.

France carried out exploratory fishing for redfish on the slopes of St. Pierre Bank and Burgeo Bank in 3P. There was a noticeable increase in catch with depth from 160 to 340 m.

USSR explorations for redfish (S. mentella) were extensive but catches were considerably lower than in previous years. Some concentrations were found in 3K and 3L during first half of the year, but shortly after spawning the redfish dispersed. Females were dominant in the pre-spawning concentrations, but with their departure to deeper water (500-600 m) for spawning, the catches declined. The prevailing sizes for males were 35-36 cm and for females 43-45 cm. In 3M the decline in catch is due to reduced fishing effort and a decrease in the catch per hour. In summer the prevailing lengths of males were 31-33 cm and females 34-35 cm, but in autumn the sizes were a little larger. Exploratory fishing in 3N and 3O sometimes produced good catches. The latter division males of 26-27 cm, and females of 27-29 cm were dominant, but up to 50% of the individuals were immature specimens.

In USSR surveys of young redfish 15 cm and smaller, young S. mentella were most plentiful along the northern part of the Southwest Slope of the Grand Bank, south of St. Pierre Bank and Green Bank and on Flemish Cap.

8. Other Fishes

From Canadian researches on the American plaice the size of this species landed in Newfoundland from the Grand Bank has changed very little in the period 1954-61.

In a French survey on the western slope of St. Pierre Bank small quantities of silver hake and argentines were noted.

9. Status of the Fishery

The cod landings in 1962 were 380 thousand tons, a substantial decline from the 460 thousand tons in 1961 and 471 thousand tons in 1960. Despite an increase of about 10 thousand tons for the inshore fishery, the decline in total cod landings is due to large decreases in the landings of some of the trawling fleets. The landings in 1960 were the second highest in the cod fishery of this subarea, the largest being 475 thousand tons in 1954.

Haddock landings were 33 thousand tons, a considerable decrease from the 80 thousand tons in 1961 and 66 thousand tons in 1960. In the previous history of the haddock fishery only the landings of 1956 (84 thousand tons) and 1955 (104 thousand tons) exceeded those of 1961. The large decrease in 1962 is attributed by Canadian researches to a decline in abundance due to the failure of year-classes and poor recruitment.

...../5

9. Status of the Fishery (Cont'd)

Redfish landings were 61 thousand tons, a further decrease from the 90 thousand tons in 1961 and 99 thousand tons in 1960. These landings represent a substantial drop from the peak landing of 246 thousand tons in 1959. The recent decline in redfish landings is attributed to decreased abundance of this species and a diversion of effort to other species and other subareas.

Flounder landings were 26 thousand tons in 1962, about the same as those for 1961 but down from the peak landing of 35 thousand tons in 1960.
