

# INTERNATIONAL COMMISSION

FOR THE

NORTHWEST ATLANTIC FISHERIES



**ANNUAL PROCEEDINGS**

Vol. 13

for the year

**1962-63**

Issued from the Headquarters of the Commission

Dartmouth, N. S., Canada

1963

## LETTER OF TRANSMITTAL

The Chairman of the International Commission for the Northwest Atlantic Fisheries presents his compliments to the Governments signatory of the International Convention for the Northwest Atlantic Fisheries signed at Washington under date of 8 February 1949, and to the Commissioners and observers representing those Governments and has the honour to transmit herewith annual proceedings of the International Commission for the Northwest Atlantic Fisheries for the year 1962-63.

This is the thirteenth annual report of proceedings of the Commission and is an authoritative record of its activities and achievements during the period 1 July 1962 to 30 June 1963. The report contains an account of the activities of the Commission's Secretariat, an account of the Thirteenth Annual Meeting and summaries of research carried out in each of the five Convention subareas.

This report is prepared and transmitted in conformity with the requirements of Article VI (1) (f) of the International Convention for the Northwest Atlantic Fisheries and Rules 8 (g) and 22 (a) of the Rules of Procedure of the Commission.

K. Sunnanaa,  
Chairman

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## PART 1

## Administrative Report for the Year Ending 30 June 1963

## 1. Commission's Chairman, George R. Clark, Passes Away Suddenly in Tokyo.

Mr. George R. Clark, Chairman of the International Commission for the Northwest Atlantic Fisheries (ICNAF) and Deputy Minister of Fisheries for Canada, died of a heart attack in Tokyo, Japan, on 12 February 1963.

Mr. Clark was appointed a Commissioner to ICNAF for Canada in 1956. At the 1959 Annual Meeting he was elected Vice Chairman of the Commission, and when Mr. A. Suomela retired in May 1961 as Chairman, Mr. Clark became Acting Chairman. At the 1961 Annual Meeting, Mr. Clark was elected Chairman, and he served as such until his death.

The premature death of Mr. Clark has - judging from the numerous condolences received from member countries - been a great loss to the Commission. A well-deserved appreciation of Mr. Clark's many and excellent services to the Commission will appear elsewhere. In this report, I shall only recognize his never-failing interest and assistance in the welfare and the work of the Secretariat. His keen intellect, quick perception and great capacity for work combined with a kind and understanding personality made it a pleasure to work with him.

After the death of Mr. Clark, the Vice Chairman, Mr. B. Dinesen of Denmark, exercised the powers and duties of the Chairman in conformity with Rules (No. 9) of the Commission. Since the retirement of Mr. Dinesen from service with the Danish Government in mid-April of 1963, the offices of Chairman and Vice Chairman of the Commission have been vacant.

## 2. Officers during the Year

Chairman of Commission—

Mr. G. R. Clark, Canada

Mr. B. Dinesen, Denmark (now vacant)

Vice Chairman of Commission—

Mr. B. Dinesen, Denmark (now vacant)

Chairman of Panel 1—

Mr. K. Sunnanaa, Norway

Chairman of Panel 2—

Mr. B. C. Engholm, United Kingdom  
(now vacant)

Chairman of Panel 3—

Dr. G. K. Izhevsky, Union of Soviet Socialist  
Republics

Chairman of Panel 4—

Dr. Rodriguez Martin, Spain

Chairman of Panel 5—

Mr. H. R. Earle, Canada (now vacant)

The above Chairmen were elected at the 1961 Annual Meeting to serve for a period of two years

Chairman of Standing Committee on Finance and Administration—

Dr. J. H. MacKiehan, Canada

Chairman of the Standing Committee on Research and Statistics—

Mr. R. J. H. Beverton, United Kingdom

These two Chairmen were elected at the 1962 Annual Meeting and are holding office for a period of one year.

## 3. Panel Memberships for 1962/63

Panel	1	2	3	4	5	Total
Canada		+	+	+	+	4
Denmark	+					1
France	+	+	+	+		4
Germany	+	+				2
Iceland	+					1
Italy			+	+		2
Norway	+					1
Poland	+	+	+			3
Portugal	+	+	+	+		4
Spain	+	+	+	+		4
USSR	+	+	+	+	+	5
UK	+	+	+			3
USA			+	+	+	3
TOTAL	10	8	9	7	3	37

#### 4. Changes in the Staff of the Secretariat

On 1 August 1962 the vacant position of clerk-stenographer was filled by Miss Gertrude Schrader.

On 21 April 1963, Miss Else Poulsen resigned from her position as typist. The vacant position was filled by Miss Barbara House.

On 30 April 1963, Dr. Erik M. Poulsen resigned from his position as Executive Secretary. The vacant position was filled by Mr. Lewis R. Day who commenced service with the Commission on 1 March 1963 in order to ensure (a) a period of overlap to facilitate the change, and (b) the services of an Executive Secretary during the 6 weeks biennial leave due to the retiring Executive Secretary.

On 30 June 1963, Miss Margaret Henderson resigned as secretary. The vacant position was filled by Miss Jean Maelellan with effect from 1 July 1963.

#### 5. Newsletters

Newsletters were distributed from headquarters in order to provide information relative to the Commission's activities and interests (on 20 August 1962, 20 December 1962, and 31 March 1963).

#### 6. Commission's Publications

In October 1962 the "Report of Working Group of Scientists on Fishery Assessment in Relation to Regulation Problems" edited by R. J. H. Beverton and V. M. Hodder, was issued as Supplement to Annual Proceedings, Vol. 11.

The "Annual Proceedings", Vol. 12, dealing with the administrative year, 1961/62 was published in December 1962.

The "Statistical Bulletin", Vol. 10 for the year 1960 was published in October 1962.

The "Sampling Yearbook", Vol. 5. Part II for the year 1960 was circulated in September 1962.

The "Redbook" 1962, dealing with the 1962 Annual Meeting was published as follows: Part I -

October 1962; Part II - November 1962; and Part III - December 1962.

The Report of the Marking Symposium held in May 1961, is now in press in Kiel, Germany.

Selected Papers on Gear Selectivity from the Joint FAO/ICES/ICNAF Meeting in 1957 in Lisbon were, in accordance with the Commission's decision in the 1962 Annual Meeting, handed over by the original editors to the Secretariat in December 1962 and are now in press in Halifax.

#### 7. Co-operation with Other International Organizations

This co-operation has been continued during the year. An exchange of observers at meetings and of proceedings of meetings has taken place.

The Commission's Statistician has, as a member of the FAO/ICES/ICNAF Continuing Working Party, participated in the Meeting of that party held in Rome from 18-22 March 1963.

#### 8. Co-operation with Non-Member Countries

Belgium continues to report data from periodic exploratory fishing in the Convention Area.

Japan has carried out exploratory fishing in Convention waters within the past year and is supplying catch statistics in the form required by ICNAF.

#### 9. Research Programmes

Research programmes for 1963 were forwarded from member countries during December 1962 through April 1963.

#### 10. Summaries of Research

Summaries of researches in 1962 by countries are being received in the Secretariat and distributed for the 1963 Annual Meeting.

#### 11. Sampling

In previous issues of the Sampling Yearbook, the Commission has published all data for length frequencies, age frequencies and age/length keys

or frequencies. With the increase in the amount of sampling data, submitted by countries, the Sampling Yearbook has grown extensively in size and it was therefore recommended by the Subcommittee that age/length keys and frequencies not be published. These keys have been deposited with the Secretariat and will be made available in mimeographed form to Working Groups and individuals upon request. The available data by species is published in table form in the appropriate section in the volume.

A further change in tabular presentation in the Sampling Yearbook has come about as the result of a recommendation made by the Commission in 1961, that the order of break-down should be: species, area, gear, month, country. The change should greatly facilitate the use of this publication by bringing it more in line with the order found in the Statistical Bulletin.

The Sampling Yearbook, Volume 6 for the year 1961, incorporating the above recommendations, reporting on cod, haddock, redfish, American plaice, winter flounder, pollock, white hake and cusk was distributed in May 1963.

## 12. Collection of Statistics

The collection and compilation of statistics by the Commission has continued in accordance with the requirements as prescribed by the Commission at the 1962 Annual Meeting. It is expected that Volume 11 of the Statistical Bulletin will be published well before the December deadline.

## 13. Otolith Exchange Programmes

In accordance with the Commission's decision at the 1961 Annual Meeting, Cod and Redfish Otolith Exchange Programmes, with reference to spawning zones, were initiated early in 1962. At present 16 cod samples and 8 redfish samples are in circulation between interested countries.

Since all cod and redfish samples have not yet been circulated to all the participating countries, it would undoubtedly prejudice the readings of others if part of this survey should now be published. It is regrettable that the circulation of these samples has not been as expedient as had been anticipated earlier.

Samples from the Halibut Otolith Exchange Programme which was initiated following the decision made at the 1959 Annual Meeting were circulated amongst all the interested member countries. This was reported in the 1962 Meeting Document No. 7. Since that time the International Pacific Halibut Commission has co-operated in this programme by reading the four samples previously circulated. The result of these readings has been added to the original document and re-distributed in October 1962. The International Pacific Halibut Commission has further co-operated by providing a sample from their laboratory, and this sample is currently being circulated amongst the interested scientists of three member countries.

## 14. Fisheries Regulations

The proposals for trawl regulations in Sub-areas 1, 2, 3 and 4 and reservations to them by countries are still under consideration by member countries. (A report on the present status of these proposals is prepared by the Executive Secretary for the 1963 Annual Meeting as Meeting Document No. 26).

## 15. Resolution on Harp and Hood Seals

A resolution to bring harp and hood seals under the provisions of the Convention was adopted by the Commission at the 1961 Annual Meeting. Text of the protocol as prepared and circulated by the Depositary Government has to date been approved in draft by all but one of the Contracting Governments.

## 16. Inspection of Fisheries

The collection of detailed data on the results of inspections by member countries of trawl fisheries in regulated subareas has been continued, and data for the year 1962 will be submitted for consideration by the Commission in the 1963 Annual Meeting (see 1963 Meeting of Commissioners Note No. 3).

## 17. Meetings

The Ageing Techniques Workshop met in Bergen, Norway, in November 1962 under the Chairmanship of Dr. Birger Rasmussen. The

workshop dealt with techniques for ageing of otoliths, with the terminology to be applied in these studies, and with various kinds of difficulties met in reading otoliths. A report of the workshop's meetings is prepared as Document No. 3 for the 1963 Annual Meeting.

A mid-year meeting of ICNAF scientists was held in St. Andrews, N. B., Canada. Scientists from the Biological Stations in St. Andrews, N. B., Boothbay Harbour, Maine, and Woods Hole, Mass., participated. The main subjects were environmental conditions, herring, scallop and groundfish. A report of the meeting is distributed as Document No. 2 for the 1963 Annual Meeting.

The Co-ordinating Committee for the planning of the Environmental Survey in the northern part of the Convention Area in the spring and summer months of 1963, met under the chairmanship of Mr. A. J. Lee in Charlottenlund Denmark (during the ICES Meeting) on 8 and 9 October 1962 to finalize plans.

The Thirteenth Annual Meeting of the Commission was held at the Commission's Headquarters in Halifax, N. S., Canada from 3-8 June 1963. Earlier meetings included a meeting of Scientific Advisers to Panel 5 at the United States Bureau of Commercial Fisheries, Biological Laboratory, Boothbay Harbour, Maine, U.S.A. from 20-22 May 1963, meetings of the Assessment Group at Dalhousie University, Halifax, N. S. from 22-25 May 1963, meetings of the Standing

Committee on Research and Statistics and of Scientific Advisers to Panels at Dalhousie University from 27 May-1 June 1963. The Chairman's Report of the Thirteenth Annual Meeting is printed as Part 2 of this volume.

## 18. Other Matters

During the year a system for the reporting of tagging experiments to the Commission and the distribution of the reported data to interested institutes in the member countries has been initiated in conformity with a decision by the Standing Committee on Research and Statistics (Redbook, 1962, Part I, p. 44-45).

Data for the "List of Fishing Vessels" for 1962 are now being collected by the Secretariat, and the publishing of the List will be effected when data from all countries have been received.

## 19. Financial Statement for the Fiscal Year ending 30 June 1963

The accounts of the Commission for the year ending 30 June show an appropriation of \$ Can. 67,540 and a total expenditure of \$67,152.

The audit of the Commission's finances for the fiscal year ending 30 June 1963 was made by the Auditor General's Office of the Government of Canada in July 1963.

The report of the Auditor General of Canada, 9 September 1963, reads, in part:

## EXHIBIT I

**Statement of Budget Appropriations, Obligations Incurred, and Unobligated Balances of Appropriations  
for the year ended 30 June 1963  
(Expressed in Canadian Dollars)**

Purposes of Appropriations	Appropriated by Commission	Authorized Transfers	Amended Appropriations	Obligations Incurred	Unobligated Balances of Appropriations
Personal Services					
Salaries	\$31,340		\$31,340	\$31,080	\$260
Superannuation	2,700	\$ -829	1,871	1,871	—
Additional help	1,200	-792	408	408	—
Honorarium to retiring Executive Secretary	500	—	500	500	—
Travel	3,000	338	3,338	3,338	—
Transportation of things	2,600	1,918	4,518	4,518	—
Communication services	1,400	13	1,413	1,413	—
Rent and utility services	2,400	—	2,400	2,400	—
Other contractual services, including printing	17,200	-1,997	15,203	15,201	2
Supplies and materials	2,200	412	2,612	2,612	—
Equipment	600	937	1,537	1,537	—
Annual meeting	2,400	—	2,400	2,274	126
	<u>67,540</u>		<u>67,540</u>	<u>67,152</u>	<u>388</u>

## EXHIBIT II

**Statement of Income and Expenditure for the year ended 30 June, 1963  
(with comparable figures for the year ended 30 June, 1962)  
(Expressed in Canadian Dollars)**

	1963	1962
Income:		
Members' contributions assessed -		
Canada	\$ 6,674	\$ 6,526
Denmark	2,015	2,027
France	6,674	6,526
Germany	3,568	3,526
Iceland	2,015	2,027
Italy	3,568	3,526
Norway	2,015	2,027
Poland	5,234	527
Portugal	6,674	6,526
Spain	6,674	6,526
Union of Soviet Socialist Republics	8,260	5,027
United Kingdom	5,121	5,027
United States	5,121	5,027
	<u>\$63,613</u>	<u>\$54,845</u>
Miscellaneous Income -		
Sales of Publications	1,389	1,744
Bank interest and exchange	925	734
Refund of previous year's expenditure	—	27
	<u>2,314</u>	<u>2,505</u>
	<u>65,927</u>	<u>57,350</u>
Expenditure:		
Obligations incurred (Exhibit I)	<u>67,152</u>	<u>59,961</u>
Excess of obligations incurred over income, carried to surplus account	<u>1,225</u>	<u>2,611</u>

## EXHIBIT III

Statement of Assets and Liabilities as at 30 June 1963  
(with comparable figures as at 30 June 1962)  
(Expressed in Canadian Dollars)

	Assets		Liabilities	
	1963	1962	1963	1962
<b>GENERAL FUND</b>				
Cash on deposit	\$18,872	\$16,396		
Accounts receivable			Unliquidated obligations and accounts payable	\$ 7,457
Assessments	3,037		Advances on future contributions	8,380
Other	443	276	Surplus account:	
			Surplus as at 1 July	\$ 3,934
			Add:	
	443	3,313	Transfer from Working Capital Fund	769
				4,703
			Less: Excess of obligations incurred over income (Exhibit II)	1,225
				2,611
	<u>19,315</u>	<u>19,709</u>		<u>3,478</u>
				<u>19,315</u>
<b>WORKING CAPITAL FUND</b>				
Cash on deposit	\$10,000	\$10,769	Principal Fund	\$10,000
			Credits due to Member States as a result of new Member's contribution for 1961-62	-
	<u>10,000</u>	<u>10,769</u>		<u>769</u>
				<u>10,000</u>
				<u>10,769</u>

## PART 2

# Report of Thirteenth Annual Meeting of the International Commission for the Northwest Atlantic Fisheries

## Halifax, N. S., 3-7 June 1963

BY THE CHAIRMAN, MR. K. SUNNANAA

### 1. Introduction

After the Second World War, nations fishing in the fish-rich waters of the Atlantic Ocean off the Coast of North America began consultations to establish a fishery conservation agreement.

Early in 1949, the International Convention for the Northwest Atlantic Fisheries was signed by Canada, Denmark, France, Iceland, Italy, Norway, Portugal, Spain, the United Kingdom and the Government of Newfoundland and the United States. The Convention came into force for the signatory members between 1950 and 1953, for the Federal Republic of Germany in 1957, for the Union of Soviet Socialist Republics in 1958 and for Poland in 1961.

The purpose of the Convention is the investigation, protection and conservation of the fisheries of the Northwest Atlantic Ocean to maintain a maximum sustained catch from the fisheries.

The area of the Convention includes all waters, except territorial waters, from the southernmost tip of Greenland to latitude 48°N, South to 39° and then due West to the coast of the United States. Northward it extends up the coast of Labrador and the West Coast of Greenland.

The Convention is administered by the International Commission for the Northwest Atlantic Fisheries - ICNAF - which held its first Annual Meeting in April of 1951. The Commission is responsible for promoting and co-ordinating the scientific studies and, on the basis of these studies, is empowered to recommend to Contracting Governments measures "to keep the

stocks of those species of fish which support international fisheries in the Convention Area at a level permitting the maximum sustained catch." These measures include:

- (i) establishing open and closed seasons in different areas;
- (ii) closing to fishing spawning areas or areas populated by small or immature fish;
- (iii) establishing size-limits for fish which may be caught or landed;
- (iv) prescribing minimum mesh sizes which may be used in different areas;
- (v) prohibiting the use of certain fishing gear;
- (vi) prescribing an over-all catch limit for any species.

To date, only minimum mesh-size regulations have been recommended and are in force.

One of the important responsibilities of the Commission is the supervision of the administration of five Panels, one for each of 5 subareas making up the Convention area. Panel 1 administers the subarea off West Greenland, Panel 2 the subarea off Labrador, Panel 3 the subarea off the east and south of Newfoundland and on the Grand Bank, Panel 4 the subarea including the Nova Scotia Banks and the Gulf of St. Lawrence, Panel 5, the Gulf of Maine and Georges Bank. Any country carrying out substantial fishing in a subarea may become a member and take part in the work of that Panel.

The Commission presents the activities and achievements of its Thirteenth Annual Meeting.

## 2. Time and Place of Meeting

The Thirteenth Annual Meeting of the International Commission for the Northwest Atlantic Fisheries was held in the Nova Scotian Hotel, Halifax, Canada, from 3-7 June 1963 under the chairmanship of Mr. Klaus Sunnanaa of Norway.

Plenary sessions were preceded by meetings of the Working Group of Scientists on Fishery Assessment in relation to Regulation Problems. These meetings were held from 22-25 May 1963 at Dalhousie University in Halifax under the chairmanship of Dr. L. M. Dickie of Canada. The Standing Committee on Research and Statistics with its various sub-committees met from 27-31 May 1963 at Dalhousie University under the general chairmanship of Mr. R. J. H. Beverton of the United Kingdom. Groups of Scientific Advisers to each of the five Panels met at Dalhousie University on 1 June 1963.

Throughout the week of 3 June 1963, the Commission meeting in plenary session assigned various matters to and heard reports and recommendations from meetings of Commissioners, an *ad hoc* Committee on Trawl Regulations, all five Panels and the Standing Committee on Research and Statistics and the Standing Committee on Finance and Administration.

## 3. Participants

Commissioners with advisers and experts from all thirteen member countries were present. Observers, invited by the Commission, were present from the Food and Agriculture Organization of the United Nations, the International Council for the Exploration of the Sea, and the Permanent Commission administering the International Fisheries Convention of 1946.

The names of all accredited participants are given in Appendix I of this Report. A list of officers of the Commission for the year 1963-64 is presented on the inside of the front cover of this Report.

## 4. Provisional Plenary Session

Due to the death of the Commission Chairman, Mr. G. R. Clark of Canada on 12 February 1963, and the retirement from Government ser-

vice of the Vice Chairman, Mr. B. Dinesen of Denmark in April, 1963, a Provisional Plenary Session was convened by the Executive Secretary early 3 June 1963 to elect a provisional Chairman for the 1963 Annual Meeting under the provision of Rule 9 of the Commission's Rules of Procedure. Mr. Klaus Sunnanaa of Norway was unanimously elected provisional Chairman and Dr. Howard MacKichan of Canada was unanimously elected provisional Vice Chairman of the Thirteenth Annual Meeting of the Commission.

## 5. Opening of Meeting (Agenda Item 1)

The opening session was convened in the Atlantic Room of the Nova Scotian Hotel, Halifax, immediately following the Provisional Plenary Session on 3 June 1963. The Chairman of the Commission, Mr. Klaus Sunnanaa, presided at the session. Among the many guests were the Honourable Hedard Robichaud, Minister of Fisheries for Canada; the Honourable Robert L. Stanfield, Premier of Nova Scotia; Dr. A. W. H. Needler, Deputy Minister of Fisheries for Canada; Alderman F. J. Healy, representing the City of Halifax; Dr. H. D. Hicks, President-elect of Dalhousie University; and representatives from governmental institutions in Nova Scotia and fisheries organizations in the Maritime Provinces. Also present were representatives of the consular agencies of member countries and observers from other international organizations and the Commissioners and their advisers from the member countries.

Chairman Klaus Sunnanaa opened the meeting, welcoming guests, observers and delegates. The Honourable Mr. H. Robichaud, on behalf of the Government of Canada, welcomed the delegates and paid tribute to the qualities and work of its late Chairman and former Deputy Minister of Fisheries for Canada, Mr. George R. Clark. He pointed out that Dr. A. W. H. Needler, Canadian delegate to the conference which negotiated the International Convention for the Northwest Atlantic Fisheries in Washington in 1949 and the first Chairman of the Commission's Standing Committee on Research and Statistics, had accepted the post of Deputy Minister of Fisheries for Canada. The Minister spoke of the tremendous expansion in the intensity and scope of inter-

national fishing operations in the Convention area and the many new problems created for those concerned with the wise use of the resource. He congratulated the Commission and those non-member countries carrying out fishing activities in the Convention area for their friendly co-operative spirit and their sincere desire to promote the common good. He suggested that close attention be given to reported results of ICNAF scientific studies which show reduced abundance and decreasing fish sizes for some stocks of cod and haddock as fishing effort is observed to increase in the Convention area. He suggested that conservation measures, other than present ICNAF mesh regulations, may be necessary to meet this problem and urged that serious attention be given the matter.

The Honourable Robert L. Stanfield, Premier of Nova Scotia, welcomed the guests and delegates to the Province. He spoke of the close concern of the people of Nova Scotia, during all their history, about the welfare of fisheries in the north-west Atlantic and wished the Commission well in its deliberations.

Dr. H. D. Hicks, President-elect of Dalhousie University, greeted the delegates and guests on behalf of the University, which he noted had provided space for the headquarters operations of the Commission since September of 1953. He spoke of the usefulness of the relationship and hoped it would continue if the Commission should move to the Bedford Institute of Oceanography. He commended the Commission for its good reputation for international co-operation and wished it continued success.

Alderman F. J. Healy brought greetings to the Commission on behalf of the Mayor and citizens of the City of Halifax.

Captain Tavares de Almeida, Head of delegation for Portugal to the Commission, in a few well-chosen words expressed the Commission's and his personal great sorrow in the death of Mr. George R. Clark. He paid tribute to Mr. Clark's energy and enthusiasm, his foresight and friendliness, and his firm but fair leadership within the Commission.

Dr. A. W. H. Needler, Deputy Minister of Fisheries for Canada, recalled the friendships

formed during the early days of the Commission and expressed the hope that he would be able to be of assistance to the Commission in his present capacity.

Dr. J. H. MacKichan, Vice Chairman of the Commission, thanked the speakers, in turn, for their warm welcome and hospitality, after which Chairman Sunnanaa declared the Thirteenth Annual Meeting of the International Commission for the Northwest Atlantic Fisheries open.

Following adjournment of the opening session, the First Plenary Session was opened by Chairman Sunnanaa. Second and Final Plenary Sessions were convened on 5 June and 7 June. During these meetings the following business of the Commission was concluded.

#### 6. **The Agenda** (Item 2, Appendix II)

The Commission adopted, without change, the agenda which, in accordance with Rule 12 of the Commission's Rules of Procedure, had been circulated 60 days in advance of the meeting.

#### 7. **Publicity for the Meeting** (Item 3)

The Executive Secretary informed the meeting that the Canadian Government had provided the services of Mr. G. J. Gillespie and Mr. M. Ronayne of the Department of Fisheries to serve as press officers for the Commission to prepare and distribute information to the public. A Committee consisting of the Chairman of the Commission and the Chairmen of the Standing Committees on Research and Statistics and on Finance and Administration was appointed to control policy regarding publicity.

#### 8. **Review of Panel Memberships** (Item 4)

The Commission reviewed panel memberships as required under Article IV(2) of the Convention. Since all Contracting Governments were already represented on panels on the basis of their current substantial exploitation of ICNAF species of fishes in the subareas concerned and since the Commission had received no applications for new membership during the year 1962/-63, panel memberships for the year 1963/64 remain as follows:

Panel	1	2	3	4	5	Total
Canada		+	+	+	+	4
Denmark	+					1
France	+	+	+	+		4
Germany	+	+				2
Iceland	+					1
Italy			+	+		2
Norway	+					1
Poland	+	+	+			3
Portugal	+	+	+	+		4
Spain	+	+	+	+		4
USSR	+	+	+	+	+	5
UK	+	+	+			3
USA			+	+	+	3
<b>TOTAL</b>	<b>10</b>	<b>8</b>	<b>9</b>	<b>7</b>	<b>3</b>	<b>37</b>

## 9. Consideration of Administrative Matters

### (a) Reports by the Secretariat

The following reports were submitted by the Executive Secretary to the Commission from the Secretariat:

- (i) Auditor's Report for the fiscal year ending 30 June 1962 (1962 Annual Proceedings, Vol. 12, Part 1, Item 19);
- (ii) Financial and Administrative Report for the fiscal year ending 30 June 1963 (complete to 3 May 1963) (ICNAF Doc. No. 22);
- (iii) Budget estimate for the fiscal year ending 30 June 1964 (Appendix I to the Agenda for the 1963 Meeting of the Standing Committee on Finance and Administration);
- (iv) Budget forecast for the fiscal year ending 30 June 1965 (Appendix II to the Agenda for the 1963 Meeting of the Standing Committee on Finance and Administration).

### (b) Report of Standing Committee on Finance and Administration

At its first plenary session, the Commission assigned all financial and administrative items on its agenda (Items 5, 6, 7, 8, 18, 19 and 21) to the Committee for consideration. These items and

others were dealt with and reported upon by the Committee in meetings held on 4, 6 and 7 June 1963. Reports of the Committee were adopted by the Commission at its second and final plenary session. **Recommendations** adopted by the Commission are summarized below:

- (i) that the accounts of the Commission, showing expenditures totalling \$ Can. 59,961.31 against appropriations of \$61,000, and the report of the auditor, the Auditor General of Canada, for the fiscal year ending 30 June 1962, be adopted.
- (ii) that the provisional Administrative Report prepared by the Executive Secretary for the fiscal year ending 30 June 1963 with financial statements to 3 May 1963 (ICNAF Doc. No. 22) be adopted.
- (iii) that the Chairman of the Standing Committee on Finance and Administration and the Executive Secretary be authorized to accept a pending invitation from the Government of Canada to occupy office accommodation for the Secretariat in the Bedford Institute of Oceanography, Dartmouth, N. S. and to move the personnel and equipment at a time most convenient to the Secretariat and the Bedford Institute of Oceanography.
- (iv) that each Contracting Government be billed by the Commission, for payments due under the 1963/64 administrative budget of the Commission in accordance with Article XI of the Convention, on 1 August 1963.
- (v) that the Commission pay one-half of the cost of coverage for the members of the Secretariat in the Blue Cross-Blue Shield Medical-Surgical-Hospital Insurance Plan at the group rate.
- (vi) that the invitation of the Federal Republic of Germany to hold the 1964 Annual Meeting of the Commission in Hamburg in early June be accepted with thanks.

(vii) that the Executive Secretary be authorized to hire an editorial assistant with effect from 1 October 1963 at a salary not to exceed \$ Can. 5,000 per annum.

(viii) that the Commission appropriate a sum of \$ Can. 71,540 for the operation of its headquarters for the fiscal year ending 30 June 1964, the appropriation to be used for the following purposes:

1. Personal Services	
(a) Salaries.....	\$35,980.00
(b) Superannuation.....	2,800.00
(c) Additional Help.....	1,200.00
(d) Medical plan.....	200.00
2. Travel.....	6,000.00
3. Transportation of Things.....	1,200.00
4. Communication Services.....	1,600.00
5. Rent and Utility Services.....	2,400.00
6. Other Contractual Services, including printing.....	10,800.00
7. Supplies and Materials.....	2,500.00
8. Equipment.....	1,600.00
9. Annual Meeting.....	5,260.00
TOTAL.....	\$71,540.00

(ix) that the Contracting Governments note for their guidance and consideration for adoption at the Fourteenth Annual Meeting of the Commission in 1964, the following advance budget estimate totalling \$ Can. 79,500 for the fiscal year ending 30 June 1965

1. Personal Services	
(a) Salaries.....	\$38,000.00
(b) Superannuation.....	2,800.00
(c) Additional Help.....	1,200.00
(d) Medical Plan.....	300.00
2. Travel.....	3,500.00
3. Transportation of Things.....	600.00
4. Communication Services.....	1,600.00
5. Rent and Utility Services.....	2,400.00

6. Other Contractual Services including printing.....	22,100.00
7. Supplies and Materials.....	2,500.00
8. Equipment.....	1,500.00
9. Annual Meeting.....	3,000.00
TOTAL.....	\$79,500.00

(x) that the Commission note the re-election of Dr. J. Howard MacKichan as Chairman of the Committee for the year ending 30 June 1964.

#### 10. Report of ad hoc Committee on Trawl Regulations (Item 10)

The Committee, appointed at the first plenary session of the Commission, met under the chairmanship of Mr. W. C. MacKenzie of Canada, on 3 June and 6 June, to consider and report upon items in connection with the Commission's trawl regulations. The **recommendations** of the Committee, which were adopted by the Commission at its final plenary session, are summarized below:

- (i) that the Annual Returns of ICNAF Mesh Regulations, Inspections and Results by countries be accepted.
- (ii) that the Permanent Commission form "Summary of Infringements" be approved for use by the Commission to replace the existing Commission form for reporting Annual Returns of ICNAF Mesh Regulations, Inspections and Results, with a few agreed changes (1963 Meeting Proc. 14, para. 3).
- (iii) that the trawl regulations adopted at the 1961 Annual Meeting of the Commission were understood by all Contracting Governments to prohibit the use of double codends. Exemptions to this understanding were noted in the case of stern trawlers and in respect of the USSR view that a double codend does not constitute chafing gear but is termed semi-codend.

The Committee after receiving the report of its Working Group on Chafing Gear and Mesh

**Gauge Problems and after considering the chafing gear problems recommended**

(iv) that all countries be asked to send detailed drawings of the types of chafing gear used in their countries to the Commission Secretariat by 1 September 1963 for duplication and distribution to all member countries.

(v) that paragraphs IV and V of the Trawl Regulations for groundfish in Subareas 1, 2 and 3 adopted by the Commission at its Eleventh Annual Meeting (1961 Annual Proc. Vol. 11, p. 16) be amended to read as follows:

“IV. The Contracting Governments prohibit the use, by any person to whom this proposal would apply, of any means or device, other than those described in paragraph 5, which would obstruct the meshes of the nets or which would otherwise, in effect, diminish the size of the nets, provided that devices may be attached to the upper side of the codend in such a manner that they will not obstruct the meshes of the codend. Any such device must have the approval of the Commission based on scientific advice that the attached devices do not obstruct the meshes or reduce significantly the selectivity of the codend. Any approval so given may be withdrawn at any time on giving not less than twelve months' notice to the contracting government.”

“V. The Contracting Governments permit any canvas, netting or other material to be attached to the underside only of the codend of a net to reduce and prevent damage.”

(vi) that paragraphs III and IV of the Trawl Regulations for cod, haddock and flounders in Subarea 4 adopted

by the Commission at its Eleventh Annual Meeting (1961 Annual Proceedings Vol. 11, p. 18) be amended to read as follows:

“III. The Contracting Governments prohibit the use, by any person to whom this proposal would apply, of any means or device, other than those described in paragraph 4, which would obstruct the meshes of the nets or which would otherwise, in effect, diminish the size of the meshes of the nets, provided that devices may be attached to the upper side of the codend in such a manner that they will not obstruct the meshes of the codend. Any such device must have the approval of the Commission based on scientific advice that the attached devices do not obstruct the meshes or reduce significantly the selectivity of the codend. Any approval so given may be withdrawn, at any time on giving not less than twelve months' notice to the contracting government.”

“IV. The Contracting Governments permit any canvas, netting or other material to be attached to the underside only of the codend of a net to reduce and prevent damage.”

(vii) that paragraphs III and IV of the Trawl Regulation for cod and haddock in Subarea 5 adopted by the Commission at its Fifth Annual meeting (1955 Annual Proceedings Vol. 5, p. 12) be amended to read as follows:

“III. The Contracting Governments prohibit the use, by any person to whom this proposal would apply, of any means or device, other than those described in paragraph 4, which would ob-

struct the meshes of the nets or which would otherwise, in effect, diminish the size of the meshes of the nets, provided that devices may be attached to the upper side of the codend in such a manner that they will not obstruct the meshes of the codend. Any such device must have the approval of the Commission based on scientific advice that the attached devices do not obstruct the meshes or reduce significantly the selectivity of the codend. Any approval so given may be withdrawn at any time on giving not less than twelve months' notice to the contracting government.'

"IV. The Contracting Governments permit any canvas, netting or other material to be attached to the underside only of the codend of a net to reduce and prevent damage."

- (viii) that the selectivity of the topside chafers as used on USSR stern trawlers should be documented by USSR for study by the Standing Committee on Research and Statistics at the Fourteenth Annual Meeting of the Commission.
- (ix) that the trend toward elimination of top-side chafers should be encouraged by the Commission as a means of reducing possibilities for abuses in the use of top-side chafers.

The Committee reviewed the report of the Working Group on Chafing Gear and Mesh Gauge Problems, noting the need for a mesh gauge, whose measurements would be accepted in legal actions and the desirability of having a standard system of measuring meshes for the whole North Atlantic area, and **recommended**

- (x) that the Commission study the problem and place it on the agenda for solution at the Fourteenth Annual Meeting.

## 11. Report of the Meetings of Commissioners (Items 11, 12, 14 and 15)

At its first plenary session, the Commission assigned its agenda items 11, 12, 14 and 15 for consideration by the Commissioners. These items were dealt with and reported upon by the Commissioners under the leadership of Mr. Sunnanaa, the Commission's Chairman, in meetings held on 3 and 4 June 1963. Reports of the Commissioner's meetings were adopted by the Commission at the final plenary session. **Recommendations** adopted are summarized below:

- (i) that effect be given to the provision for joint enforcement of the Commission's trawl regulations, in which all member countries appear to be agreed in principle, by adopting two amendments to Article VIII of the International Convention for the Northwest Atlantic Fisheries as follows:
  - (a) at the end of paragraph (5) add "and may also, on its own initiative, make recommendations for national and international measures of control on the high seas for the purposes of ensuring the application of the Convention and the measures in force thereunder."
  - (b) at the end of paragraph (8) add "or, in the case of proposals made under paragraph (5) above, from all contracting Governments."
- (ii) that Commissioners contact member governments and press for early declaration of intent regarding the proposals for regulation of the trawl fisheries in Subareas 1, 2, 3 and 4, adopted by the Commission at the Eleventh Annual Meeting (1961 Annual Proceedings Vol. 11).
- (iii) that an informal meeting be convened to discuss the present status of the fisheries for harp and hood seals based on a paper by Dr. D. E. Sergeant of Canada. (Note: A productive meeting was held in the evening of 5 June 1963.)

- (iv) that the Standing Committee on Research and Statistics consider the question of the adequacy of the Commission's conservation measures and report upon it at the Fourteenth Annual Meeting of the Commission.
- (v) that more information be obtained from member countries about the navigational practices by components of the fishing fleets in the Convention area and that a letter be sent to the depositary Government for transmittal to member governments of the Commission drawing attention to these practices and the need for action.

**12. Report of the Standing Committee on Research and Statistics (Items 13 and 20)**

The Committee, under the chairmanship of Mr. R. J. H. Beverton of the United Kingdom, and its subcommittees and working groups, met during the week 27-31 May 1963 preceded by separate meetings of Scientific Advisers to Panel 5 at Boothbay Harbour, Maine, on herring research and of the Subcommittee on Fishery Assessments in relation to Regulation Problems at Halifax, N. S.

The report of the Committee highlights the culmination of several major projects and the initiation of new lines of co-ordinated research. Environmental studies saw the Environmental Survey (NORWESTLANT 1-3) get off to a good start in April; plans for the Environmental Symposium to be held in Rome 27 January-1 February 1964 are well advanced. The question of Joint ICES/ICNAF/FAO Statistical Reporting has been satisfactorily resolved with agreement to change the format of the Commission's Statistical Bulletin where necessary in order to implement joint reporting on modified STANA 1W forms. The Assessment Subcommittee, concentrating on obtaining better understanding of the long-term effects of fishing on the ICNAF fish stocks, have emphasized the need for development of new theoretical techniques and for a reappraisal of data requirements. A new approach is being made to age-reading co-ordination and to tech-

niques of biological sampling. Research on herring is being brought within the normal scope of the Committee for the first time and contributions are being invited on the larger pelagic species. Another new project is the launching of the Commission's scientific publication, the Research Bulletin. Stimulating and informative talks were given at informal scientific sessions on 31 May by Dr. A. S. Bogdanov on Soviet research on redfish in the Convention area, by Mr. B. E. Skud on herring research in Subarea 5, by Dr. B. Rasmussen on the Norwegian porbeagle shark fishery in the Convention area and by Dr. R. Trites on current measurements in the Gulf of St. Lawrence.

The report of the Committee with its various appendices summarizes the results of the work of the Committee and its subcommittees. These results were submitted to and adopted by the Commission at its second plenary and final plenary sessions under the following headings:

**(a) Assessments:**

The Committee approved the report of the Assessment Subcommittee and **noted** that,

- (i) for mesh assessments, further long-term assessments have not been possible; that a technique has been devised for estimating catch change during the transitional period following a mesh change; that the effect of catch size on selectivity for cod and haddock is unlikely to be of any practical significance; for the northern redfish fisheries where catches are large there is no new information for any reappraisal of mesh size effects;
- (ii) for catch/effort assessment, data from Subarea 5 show that present effort on cod is probably higher than that which could give the maximum sustained with 4½" mesh; for haddock, present effort is providing landings near the sustainable maximum and apart from these conclusions for Subarea 5, long term catches would be rather insensitive to moderate changes in the amount of fishing from the 1958 level.

- (iii) future research on fishery assessments in relation to both catch/effort changes and to mesh effects will be directed toward development of new theoretical techniques for interpreting and predicting trends in ICNAF fisheries and the reappraisal of basic data requirements.

**(b) Gear and Selectivity:**

The Committee approved the report of the Gear and Selectivity Subcommittee and **noted** that a modified form of ICNAF topside chafing gear used by USSR during the Selectivity Experiments at Iceland in 1962 showed no evidence of influencing selectivity of cod; that further experience is necessary before the Commission can be advised of the performance of the ICES mesh gauge relative to that of the ICNAF gauge; that evidence of significant differences between the selection factors for natural and synthetic meshes of the same size warrant further study.

**(c) Environmental Studies:**

Reports of the Environmental Subcommittee were accepted by the Committee which **noted** that

- (i) for the Environmental Symposium to be held at FAO headquarters in Rome, 27 January-1 February 1964, plans are in an advanced state of preparation with the addition of a section on "ICNAF Herring and the Environment" to be convened by Mr. B. E. Skud of the United States and with funds covering extraordinary expenses included in the 1963/64 budget.
- (ii) for the Environmental Survey (NORWESTLANT 1-3) the research vessels of France, Norway, UK and USSR successfully completed the first stage in April-May of 1963 and vessels of Canada, Denmark, Germany and Iceland are now carrying out the second stage with the third stage planned for

July. The Canadian Oceanographic Data Centre (CODC) has generously offered to process all of the hydrographic data from the survey.

- (iii) for Relations with other international bodies, the International Oceanographic Commission (IOC) at its last meeting in September 1962 welcomed the Commission's environmental programme and recommended that members of IOC give it all possible assistance; the first meeting of the FAO Advisory Committee on Marine Resources Research (ACMRR), formed in accordance with the ICNAF Resolution of 1961 (Ann. Proc. Vol. 11, p. 18) was convened early in 1963; ICNAF experts agreed to assist FAO in the preparation of synopses on haddock and halibut.

**(d) Statistics:**

The Committee reviewed the report of the meeting of the Joint ICES/ICNAF/FAO Continuing Working Party (CWP) held at Rome in March 1963 and **recommended**

- (i) that all contracting countries except Canada and US use the joint reporting form STANA 1W with a revised species grouping which will include the various sub-totals required for the ICNAF Statistical Bulletin.
- (ii) that the CWP remain in existence to provide the necessary liaison between ICES, ICNAF and FAO who are responsible for compiling and publishing North Atlantic fishery statistics.
- (iii) that the CWP should include one member of each of the Secretariats of ICNAF and ICES and the Chirmen of the Statistical Subcommittees of each.
- (iv) that the continued participation of Canada, Germany, Iceland and UK who conducted initial trials of the common reporting form is no longer necessary.

- (v) that the activities of the CWP be confined to the North Atlantic.

The Commission approved these recommendations and asked that they be transmitted to ICES and FAO with the request that the views of these organizations be made known to the Commission.

(e) **Ageing Techniques:**

The Committee reviewed the report of the Workshop on Ageing Techniques held in Bergen in November 1962 and noted that important age-reading problems were resolved and new techniques of otolith preparation and photography were demonstrated. A new system of age-reading, exchange by means of otolith photographs (prints and transparencies) was set up to improve co-ordination between age-readers.

(f) **Tagging:**

The Committee noted that the 1961 Fish Marking Symposium will be issued shortly as ICNAF Special Publication No. 4 and that steps have been taken to improve recoveries of tagged fish and sea-bed drifters and to publicize tagging operations in the Convention Area.

(g) **Sampling:**

The Committee noted that studies on ways and means of condensing biological sampling data in the interests of economy were made and more are projected.

(h) **Publications:**

The Committee recommended the following items from the Report of the Action Subcommittee.

- (i) that the selectivity papers from the 1957 Lisbon Meeting be published at an early date as ICNAF Special Publication No. 5.
- (ii) that the Research Bulletin of ICNAF be launched in the coming year with the Executive Secretary as Editor assisted by the Chairman of the Standing Committee on Research and Statistics and the members of the Action Committee. All contributions will be submitted to one or more of a panel of expert referees.

- (iii) that a standard format for National Research Reports, as prepared by the Committee, be accepted.

- (iv) that the contributions to and proceedings of the Environmental Symposium be published in ICNAF Special Publication Series (large size) and that a sum of \$7,500 be allocated in the fiscal year 1964/65.

- (v) that the main results of the Environmental Survey (NORWESTLANT) be published in the ICNAF Special Publication Series in 1965/66.

(i) **Organization and Administration of R and S**

The Committee recommended the following items from the Report of the Action Subcommittee.

- (i) that the name "Action Committee" be changed to "Steering and Publications Subcommittee" to better describe the function and status.

- (ii) that Poland be included with the Group Denmark, Germany and UK for representation on the S and P Subcommittee.

- (iii) that the scope of the Gear and Selectivity Subcommittee be extended to include information and contributions on design, performance and selectivity of fishing gear and associated equipment in use in the Convention Area.

- (iv) that studies on herring of the Convention Area be included within the scope of the Committee and that scientific contributions be invited on larger pelagic species for presentation and discussion at the 1964 Annual Meeting.

- (v) that the subcommittees on Assessments, Environmental Studies, Statistics, Gear and Selectivity, Ageing Techniques and Sampling function during the coming year and at the 1964 Annual Meeting. In addition, meetings of *ad hoc* groups on Tagging and Herring be convened.

(vi) that the Assessment Subcommittee and the *ad hoc* Group on Herring each meet on the Friday and Saturday immediately before the meetings of the Standing Committee on Research and Statistics and also arrange a joint session to review mutual problems.

(j) The Committee re-elected Mr. R. J. H. Beverton of the United Kingdom as Chairman for the ensuing year.

### 13. Reports of Meetings of Panels

(Items 4, 13, 22)

The Commission reviewed and approved the reports of Panels 1 to 5. Each panel considered the status of the fisheries, the research carried out and plans for future work based on reports by its group of scientific advisers.

#### (a) Panel 1. The panel recommended

- (i) that a more uniform pattern be adopted by the Commission for the preparation of research reports for member countries. [A format was prepared by the Action Subcommittee of the Standing Committee on Research and Statistics (Redbook 1963, Section III, App. VIII) and approved by the Commission (see Section 12 (h) (iii) above) ].
- (ii) that USSR, Germany, Denmark and Iceland exchange redfish ageing material and report to the Standing Committee on Research and Statistics at the next annual meeting.
- (iii) that the offer made by Spain to collect information for the 1964 meeting on the increased by-catch of Atlantic salmon by trawlers in Divisions 1B and 1C be accepted.
- (iv) that based on results of latest biological research, no change in the mesh assessment be recommended.

Mr. G. Möcklinghoff of the Federal Republic of Germany was unanimously elected Chairman of the panel for the two ensuing years.

(b) **Panel 2.** The panel reviewed the status of the fisheries in Subarea 2 and **noted** that total cod landings showed great increases in recent years to 225 thousand tons in 1962 as a result of substantially increased effort on great new deep-water concentrations in winter-spring. Correspondingly the effort for and catch of redfish decreased. The panel further **noted** that there was still insufficient scientific evidence to warrant any recommendations for further conservation measures and that extensive environmental studies and cod tagging experiments will be undertaken by both Canada and USSR. Mr. H. Gardner of the United Kingdom was unanimously elected Chairman of the panel for the two ensuing years.

(c) **Panel 3.** The panel considered the reports on the status of the fisheries and the research work and noted that cod landings were down from 460 thousand tons in 1961 to 380 thousand tons due to changes in the movements and species interests of the fishing fleet. Decreased haddock landings on the other hand were apparently due to poor recruitment of year-classes. No changes were recommended in previous assessments for cod, haddock and redfish pending collection of further data.

Mr. V. M. Kamentsev of the Union of Soviet Socialist Republics was unanimously elected Chairman of the panel for the ensuing two years.

(d) **Panel 4.** The panel noted the substantial increase in landings of "other groundfish" attributed to USSR catches of great silver smelt (argentine) and silver hake and increased Canadian catches of pollock. Landings of pelagic species increased largely due to new USSR April driftnet fishery for herring in Division 4V. The panel noted that Canada, USA and USSR will conduct racial studies on herring stocks in Subareas 4 and 5.

#### The panel recommended

- (i) that the name "argentine", which is now commonly used for the great silver smelt (*Argentina silus*), should

be used in all Commission biological and statistical reports.

Captain Tavares de Almeida of Portugal was unanimously elected Chairman of the panel for the two ensuing years.

- (e) **Panel 5.** The panel noted that scientific meetings were held in December 1962 in St. Andrews with panel advisers from Canada and USA and in May 1963 in Boothbay Harbour with advisers from Canada, USA and USSR. Greatly increased landings were recorded in 1962 for herring and silver hake in particular. The panel noted the reports of its scientific advisers that the Georges Bank haddock stock appears now to be exploited at near its maximum sustainable yield. There were no biological grounds for recommending advantageous mesh size regulation in the silver hake, red hake, redfish and American plaice fisheries at this time. There were co-ordinated plans for more research on the increasingly important herring stocks in the area.

Mr. W. C. MacKenzie of Canada was unanimously elected Chairman of the panel for the two ensuing years.

#### 14. **Observers from the Commission to other Meetings** (Items 16 and 17)

- (i) The Commission in plenary session **agreed** that the Chairman and Executive Secretary should be empowered to appoint observers when necessary.
- (ii) The Commission heard or received reports from FAO and from Commission observers to the 1962 meeting of ICES and to the May meeting of the Permanent Commission and **noted** that Mr. R. J. H. Beverton of the United Kingdom would be reporting to the Standing Committee on Research and Statistics on the 1963 meeting of ICES and Dr. C. E. Lucas of the United Kingdom would be reporting on the 1963 meeting of the Intergovernmental Oceanographic Commission (IOC).

#### 15. **Election of Chairman and Vice Chairman** (Item 23)

The Commission, in final plenary session on 7 June 1963, unanimously elected Mr. Klaus Sunnanaa of Norway, Chairman and Mr. Frank Briggs of the United States, Vice Chairman for the two ensuing years.

#### 16. **Acknowledgements and Adjournment** (Items 24 and 25)

The Commission unanimously **agreed** that a letter should be sent to the President and Board of Governors of Dalhousie University expressing the appreciation of the Commission for providing accommodation for the meetings of the Assessment Subcommittee and the Standing Committee on Research and Statistics in May 1963 and for the Commission's headquarters since September, 1953.

Mr. H. Gardner of the United Kingdom expressed the Commission's appreciation of the work and co-operation of the Secretariat.

Dr. M. Ruivo thanked the Commission on behalf of FAO for the invitation to attend the meetings.

The Executive Secretary announced plans for a tour of the Bedford Institute of Oceanography and the Halifax Laboratory of the Fisheries Research Board of Canada, beginning at 2:00 p.m.

The Chairman of the Commission, Mr. Sunnanaa, thanked the delegates, the Canadian Government for public relations and secretarial help, the Chairmen of the two Standing Committees and all others contributing to the success of the 13th Annual Meeting of the Commission. Special thanks was extended to the Canadian Commissioners, the Province of Nova Scotia and the City of Halifax for their hospitality, and to Dr. D. Sergeant of the Arctic Unit of the Fisheries Research Board for his special presentation on the status of the harp seal stocks in the Convention area.

The Chairman declared the 13th Annual Meeting of the Commission adjourned at 12:30 p.m., 7 June 1963.

## APPENDIX I

### LIST OF PARTICIPANTS

#### CANADA:

##### Commissioners:

Mr. Wm. MacKenzie, Dept. of Fisheries,  
Ottawa, Ontario.

Dr. J. H. MacKichan, 1131 South Park St.,  
Halifax, Nova Scotia.

Mr. P. P. Russell, Bonavista Cold Storage,  
St. John's, Newfoundland.

##### Advisers:

Mr. L. E. Baker, Dept. of Fisheries, Halifax,  
Nova Scotia.

Mr. Emygdio Cadima, Fisheries Research  
Board of Canada, St. Andrews, New  
Brunswick.

Mr. R. S. Collie, Dept. of Fisheries, Halifax,  
Nova Scotia.

Dr. L. M. Dickie, Fisheries Research Board  
of Canada, St. Andrews, New Brunswick.

Dr. J. L. Hart, Fisheries Research Board of  
Canada, St. Andrews, New Brunswick.

Mr. V. M. Hodder, Fisheries Research Board  
of Canada, St. John's, Newfoundland.

Mr. D. E. Holmes, Dept. of Fisheries,  
Halifax, Nova Scotia.

Dr. A. C. Kohler, Fisheries Research Board  
of Canada, St. Andrews, New Brunswick.

Dr. L. M. Lauzier, Fisheries Research Board  
of Canada, St. Andrews, New Brunswick.

Dr. W. R. Martin, Fisheries Research Board  
of Canada, Ottawa, Ontario.

Dr. J. C. Medcof, Fisheries Research Board  
of Canada, St. Andrews, New Brunswick.

Mr. J. E. Paloheimo, Fisheries Research  
Board of Canada, St. Andrews, New  
Brunswick.

Mr. H. D. Pyke, Lunenburg Sea Products,  
Lunenburg, Nova Scotia.

Dr. D. E. Sergeant, Fisheries Research Board  
of Canada, Montreal, Quebec.

Dr. W. Templeman, Fisheries Research  
Board of Canada, St. John's, Newfound-  
land.

Mr. S. N. Tibbo, Fisheries Research Board  
of Canada, St. Andrews, New Brunswick.

#### DENMARK

##### Commissioners:

Dr. P. M. Hansen, Grønlands Fiskeriunder-  
søgelse, Copenhagen.

Mrs. G. Skibsted, Fiskeriministeriet, Copen-  
hagen.

##### Advisers:

Mr. Sv. Aa. Horsted, Grønlands Fiskeriund-  
ersøgelse, Copenhagen.

Mr. J. S. Joensen, Fiskivinnustovan, Foroya  
Landstyri, Torshavn, Faroe Islands.

#### FRANCE

##### Commissioners:

Mr. L. J. Audigou, French Embassy,  
Washington, D. C.

Mr. R. H. Letaconnoux, Institut Scientifique  
et Technique des Pêches Maritimes, Paris.

Mr. J. Rougé, Marine Marchande, Paris.

##### Advisers:

Mr. A. Dezeustre, Pecheries de Bordeaux-  
Bassens, Bordeaux.

Mr. E. A. Lagarde, Marine Marchande, Paris.

Mr. Y. LeBoeuf, Inscription Maritime, St.  
Pierre et Miquelon.

#### GERMANY

##### Commissioners:

Dr. G. Meseck, Bundesministerium für  
Ernährung, Landwirtschaft und Forsten,  
Bonn.

Mr. G. Möcklinghoff, Bundesministerium  
für Ernährung, Landwirtschaft und For-  
sten, Bonn.

##### Advisers:

Dr. G. Krefft, Bundesforschungsanstalt für  
Fischerei, Institut für Seefischerei, Ham-  
burg.

Dr. J. Messtorff, Bundesforschungsanstalt  
für Fischerei, Hamburg.

#### ICELAND

##### Commissioner:

Dr. J. Jónsson, University Research Institute,  
Reykjavik.

## ITALY

## Commissioner:

Dr. G. Cannone, Direttore di Sezione, Ministero Marina Mercantile, Rome.

## NORWAY

## Commissioners:

Mr. K. Sunnanaa, Fiskeridirektoren, Bergen.  
Dr. B. Rasmussen, Institute of Marine Research, Bergen.

## POLAND

## Commissioner:

Dr. F. Chrzan, Sea Fisheries Institute, Gdynia.

## PORTUGAL

## Commissioner:

Captain Tavares de Almeida, Captain, Portuguese Navy, Lisbon.

## Adviser:

Dr. R. Monteiro, Instituto de Biologia Maritima, Ministerio da Marinha, Lisbon.

## SPAIN

## Commissioners:

Captain J. L. Arambarri, Delegado de "Pysbe", St. John's, Newfoundland.  
Dr. O. Rodriguez-Martin, Direccion General de Pesca Maritima, Madrid.

## UNITED KINGDOM

## Commissioners:

Mr. R. J. H. Beverton, Fisheries Laboratory, Lowestoft, England.  
Mr. H. Gardner, Ministry of Agriculture and Food, London, England.  
Dr. C. E. Lucas, Marine Laboratory, Aberdeen, Scotland.

## Advisers:

Mr. A. J. Lee, Fisheries Laboratory, Lowestoft, England.  
Mr. B. B. Parrish, Marine Laboratory, Aberdeen, Scotland.

## U.S.S.R.

## Commissioners:

Dr. A. S. Bogdanov, All-Union Research Institute of Marine Fisheries and Oceanography, (VNIRO), Moscow.

Mr. V. M. Kamentsev, State Fisheries Committee, Moscow.

Mr. S. A. Studenetski, Atlantic Research Institute of Marine Fisheries and Oceanography, (ATLANTNIRO), Kaliningrad.

## Advisers:

Mr. G. A. Semin, State Fisheries Committee, Moscow.

Mr. A. A. Volkov, State Fisheries Committee, Moscow.

Mr. G. P. Zakharov, Polar Research Institute of Marine Fisheries and Oceanography (PINRO), Murmansk.

## UNITED STATES

## Commissioners:

Mr. F. P. Briggs, Assistant-Secretary for Fish and Wildlife, Dept. of the Interior, Washington, 25, D.C.

Mr. R. W. Green, Dept. of Sea and Shore Fisheries, Augusta, Maine.

Mr. T. A. Fulham, 280 Northern Avenue, Boston, Massachusetts.

## Advisers:

Mr. J. T. Gharrett, Bureau of Commercial Fisheries, Gloucester, Massachusetts.

Dr. H. W. Graham, Bureau of Commercial Fisheries, Woods Hole, Massachusetts.

Mr. R. C. Hennemuth, Bureau of Commercial Fisheries, Woods Hole, Massachusetts.

Mr. J. E. King, Bureau of Commercial Fisheries, Dept. of the Interior, Washington 25, D.C.

Mr. J. B. Skerry, Bureau of Commercial Fisheries, Gloucester, Massachusetts.

Mr. B. E. Skud, Bureau of Commercial Fisheries, Boothbay Harbour, Maine.

Mr. J. A. Slater, Office of International Relations, Dept. of the Interior, Washington 25, D.C.

Mr. D. L. McKernan, Bureau of Commercial Fisheries, Dept. of Interior, Washington 25, D.C.

## FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

## Observers:

Mr. L. P. D. Gertenbach, Fisheries Division,

FAO, Rome, Italy.  
 Dr. Mario Ruivo, Fishery Biology Branch,  
 FAO, Rome, Italy.

INTERNATIONAL COUNCIL FOR THE  
 EXPLORATION OF THE SEA  
 Charlottenlund, Denmark.

Observer:

Dr. C. E. Lucas.

INTERNATIONAL FISHERIES  
 CONVENTION, 1946

Office of the Permanent Commission, Room  
 413, 3 Whitehall Place, London, England.

Observer:

Mr. K. Sunnanaa.

INTERNATIONAL NORTH PACIFIC  
 FISHERIES COMMISSION:

6640 N.W. Marine Drive, Vancouver, B.C.

PUBLIC RELATIONS:

Mr. G. J. Gillespie, Dept. of Fisheries,  
 Halifax, Nova Scotia.

Mr. M. S. Ronayne, Dept. of Fisheries,  
 Ottawa, Ontario.

SECRETARIAT

Mr. L. R. Day, Executive Secretary.

Mr. B. F. C. DeBaie, Biologist-Statistician.

Miss Margaret Henderson, Secretary.

Miss Barbara House, Typist.

Miss Gertrude Schrader, Clerk-Stenographer.

SECRETARIAL ASSISTANTS

Miss M. E. Smith, Dept. of Fisheries, Halifax,  
 Nova Scotia.

Miss K. West, Dept. of Fisheries, Halifax,  
 Nova Scotia.

Mrs. Nora Butler, Personnel Pool Ltd.,  
 Halifax, Nova Scotia.

Mrs. M. McPhail, Fisheries Research Board  
 of Canada, Halifax, Nova Scotia.

Mrs. S. Delong, Fisheries Research Board of  
 Canada, Halifax, Nova Scotia.

Mrs. H. Gamester, Fisheries Research Board  
 of Canada, Halifax, Nova Scotia.

Mr. T. Kidney, Addressograph-Multigraph,  
 Halifax, Nova Scotia.

## APPENDIX II

### AGENDA

1. Opening by the Chairman.
2. Adoption of Agenda.
3. Policy with regard to publicity for the Annual Meeting.
4. Review of panel memberships (vide Meeting Document No. 1).
5. Report on staff matters, with presentation of the Administrative Report 1962/63 and up to date financial statements for 1962/63.
6. Presentation of Auditor's Report for the financial year 1961/62 (Annual Proceedings, Vol. 12).
7. Budget estimates for 1963/64 (See appendix 1 to Agenda for the Committee on Finance and Administration).
8. Advance budget estimate for 1964/65 (See Appendix 2 to Agenda for the meetings of the Committee on Finance and Administration).
9. Office accommodation for Commission's headquarters.
10. Consideration, by an *ad hoc* committee, of items in connection with ICNAF trawl regulations.
  - (a) Annual returns of inspections and results.
  - (b) Improvement to ICNAF form for reporting annual returns
  - (c) Prohibition of use of double cod-ends
  - (d) Use of flap-type chafers
  - (e) Suitable mesh gauge for enforcement purposes
11. Consideration of the establishment of a joint enforcement system for ICNAF trawl regulations.
12. Report on the status of proposals by the Commission adopted in the 1961 Annual Meeting.
  - (a) Proposals for trawl regulations in Sub-areas 1, 2, 3 and 4.
  - (b) Proposal for inclusion of harp and hood seals in the provisions of the Convention and of the establishment of a panel for dealing with conservation measures for these seals.
13. Consideration of conservation requirements.
  - (a) Minimum mesh size regulation in Sub-area 3, Divisions NOP for redfish.
  - (b) Minimum mesh size regulations in Subarea 4 for species other than cod, haddock and flounders, particularly redfish.
  - (c) Measures for scallop fishery in Subarea 5.
  - (d) Possible extension of mesh size regulations in Subarea 5 for species other than cod and haddock.
14. Consideration of the necessity for increased activity by the Commission to ensure the proper conservation of the fisheries in the ICNAF area. Report by the *ad hoc* Committee appointed after the 1962 Annual Meeting.
15. Consideration of:
  - (a) Chairman's letter of October 30th re "Fishing Rules of the Road" or "Code of behaviour" for fishing in ICNAF area.
  - (b) Captain Tavares de Almeida's letter of 12 February 1963, concerning "Rules for Navigation on the Fishing Grounds."
16. Reports by ICNAF observers on meetings of other organizations held during the preceding year.
17. Invitations to the Commission to be represented by observers at meetings of other international organizations.
18. Date and place of Annual Meeting, 1964.
19. Confirmation of appointment of new Executive Secretary.
20. Report of the Standing Committee on Research and Statistics including special reports on Assessment and Environmental Studies (Survey and Symposium).
21. Report of the Standing Committee on Finance and Administration.
22. Reports on meetings of Panels 1-5.
23. Election of Commission's Chairman and Vice Chairman for the two ensuing years.
24. Other business.
25. Adjournment.

## PART 3

## Summaries of Research, 1962, by Subareas

The following are summary reports of progress on research carried out and the status of the fisheries in the Commission's subareas. The summaries were prepared from the research reports and other pertinent documents submitted to the 1963 Annual Meeting of the Commission from each member country. The summaries were prepared by the Chairmen of the Groups of

Scientific Advisers to the Panels administering

the work of the Commission in the subareas.

These Chairmen were

for Sub-area 1 - P. M. Hansen

for Sub-area 2 - W. Templeman

for Sub-area 3 - W. Templeman

for Sub-area 4 - R. H. Letaconoux

for Sub-area 5 - H. W. Graham

## Subarea 1

Reports on researches in 1962 were submitted by the following member countries: Denmark, Germany, Iceland, Norway, Portugal, Spain, USSR and UK.

## 1. Work carried out

**a. Denmark:** R/V *Adolf Jensen* et al. Surveys for cod eggs and larvae in Godthåb and Fylla Bank areas. Investigations in inshore and off-shore areas of length and age of young cod and commercial-size cod. Cod tagging. Small redfish investigations and tagging of big redfish in Godthåb Fjord. Cod sampling from Faroese trawler.

**b. Germany:** R/V *Anton Dohrn* and commercial trawler. Investigation of length, age and maturity of cod. Cod tagging off Cape Thorvaldsen and on Fyllas Bank. Hydrographic observations off West and South Greenland.

**c. Iceland:** Commercial trawlers. Sampling cod and redfish for length and age.

**d. Norway:** R/V *G.O. Sars* in Divisions 1B-1E in April-May. Hydrographic sections in 1E, 1D and 1C and observations in connection with fishing experiments. Sampling of cod eggs and larvae. Experimental bottom-line fishing for cod (length and age) and longline fishing for halibut. Halibut tagging. R/V *Johan Hjort* in East Greenland waters in August-September. Hydro-

Echo sounder survey for cod. Experimental handline and bottom longline fishing for cod (length, age and food) and bottom longline fishing for halibut. Cod and halibut tagging in East Greenland waters.

**e. Portugal:** Commercial dory vessels. Sampling of cod in Divisions 1B-1D for length, age, weight, sex, maturity and fish spawning from May-September.

**f. Spain:** Commercial trawler. Sampling of cod in Divisions 1B and 1C for length and age.

**g. USSR:** R/Vs *Topseda*, *Novorossisk* and *Pobeda*. Oceanographic observations in spring and autumn and sampling of cod and redfish for length, age, maturity and food in Divisions 1B-1F.

**h. UK:** Market sampling of cod.

## 2. Hydrography.

Hydrographic work was carried out in March, April, May and August. While 1961 was unusually warm with high temperatures in the spring months, temperatures in 1962 were considerably lower in the upper water layers. In April heavy drift ice was found in Nanortalik Bank and in Julianehaab Bay (1F), and heavy ice masses occurred in the latitude of Holsteinsborg (1B). The warm Atlantic water was found in greater depths than in 1961, but its temperature was comparatively high. On the western slope of Banana Bank the highest temperatures (about 4° - 5°C)

were found between 600 and 800 m. In the southern part of Davis Strait similar conditions were found. Later in the summer the hydrographic conditions were as in normal years.

### 3. Eggs and Larvae.

Cod eggs and larvae were found in very small numbers in Godthåb Fjord and also in Davis Strait their occurrence seemed to be rather poor. Unfortunately only very limited research work on cod larvae could be carried out in the summer months in Davis Strait.

### 4. Cod.

**a. Spawning observations.** While the heaviest spawning in 1960 occurred on the western slope of Banana Bank the main spawning area in 1961 and 1962 seemed to be on the slope of the banks south of Fylla Bank. The spawning took place about three weeks later than in 1961, occurring from about the middle to the end of April west of Banana Bank (1C), Dana Bank (1D) and off Storøen (1E). Further to the south in Nanortalik Bank (1F) only immature cod were found. The cod spawned in 350-600 m. In 1C the percentages of mature cod of age-groups 5 and 6 were 20% and 73-80% respectively. Cod older than age-group 6 were all mature.

**b. Age-groups 1, 2 and 3.** No large shoals of small cod were observed in the seine and trawl catches made in the coastal region close to the shore. It seems, however, that the 1960 year class must be considered as a promising year class. while 1959 will possibly be very poor. Cod belonging to the 1960 year class will be of importance to the commercial fishery for the first time in 1965.

**c. Commercial stock.** The former rich 1947, 1950 and 1953 year classes had nearly disappeared from the West Greenland cod stock while the 1956 and 1957 year classes predominated in the catches, the former in division 1E and 1F, the latter in 1A, 1B, 1C and 1D. This applied to the offshore banks as well as to the coastal waters. In samples from 1A -1D the 1957 year class amounted to 60-90% while the 1956 year class predominated in samples from 1E and 1F with about the same percentages. The boundary between

the areas where these two rich year classes predominated seemed to be in the southern part of 1D. The Summary of Research in Subarea 1 in 1961 (ICNAF Annual Proceedings Vol. 12, p. 21) reported that the difference in distribution between these two year classes must be explained by the fact that the 1956 year class originates from East Greenland spawning grounds, while the 1957 year class comes from spawning grounds on the slopes of the West Greenland offshore banks. The same Summary also reported that the distribution and richness of the 1956 and 1957 year classes was predicted in the research reports for 1959 (ICNAF Annual Proceedings Vol. 10) and 1958 (ICNAF Annual Proceedings Vol. 9). The assumption that the 1956 year class originates from East Greenland and not from Iceland spawning grounds is made probable by the fact that the 1956 year class was found predominating in samples from southeast Greenland and, according to information given by Mr. Jonsson, was a poor year class in Iceland waters. Furthermore it has been shown that spawning of cod takes place off East Greenland. This has also been shown by the large number of cod eggs found by *Ernest Holt* in Denmark Strait in April and May, 1963.

The 1963 season will probably show the same pattern of age composition and distribution of year classes as that found in 1962. Thus if nothing unforeseen happens a good fishery can be expected, mainly for medium-sized cod (65-80 cm).

**d. Tagging.** More than 6000 cod were tagged and released, 1087 in East Greenland waters. Returns of tags in 1962 from experiments in previous years confirmed that cod make feeding migrations from southern to northern banks in Davis Strait in the spring and summer and that some cod migrate from West Greenland to East Greenland, Dohrn Bank and Iceland probably on spawning migrations. 43 recaptures were reported from Iceland and 4 and 7 from East Greenland and Dohrn Bank respectively. Small cod (mainly age 2) were tagged in the coastal region.

**e. Growth.** Studies on growth rate of cod confirmed previous experience that cod in the northern part of the Subarea have a faster growth than cod in the southern part. Length and girth

content were made in order to study feeding habits of cod.

## 5. Redfish.

Depth distribution of redfish was studied in Denmark Strait and in the Cape Farewell region. Small redfish (6-16 mm) were caught in trawl with covered codend on the eastern slope of Banana Bank. The fishing with shrimp trawl for small redfish in Godthåb Fjord was continued. Also in Godthåb Fjord 561 redfish caught in pound nets were tagged. Growth and feeding of redfish was studied in Davis Strait.

## 6. Tagging of other fish.

Spotted seawolf (spotted wolffish) and Greenland halibut were tagged mainly in coastal waters.

## 7. Status of the Fisheries.

Commercial fishing was carried by Denmark, France, Germany, Iceland, Norway, Poland, Portugal, Spain and UK.

The total cod landings from the Subarea 1 increased to about 451,000 metric tons in 1962 from 345,000 metric tons in 1961 and 243,000 metric tons in 1960. Landings by member countries in 1962 increased well over 30% from 1961 landings of 90,000 metric tons by Denmark, of 84,000 metric tons by Germany, of 68,000 metric tons by Portugal and of 40,000 metric tons by France. Landings by Iceland dropped 90% from 11,000 metric tons and landings by Norway dropped almost 30% from 43,000 metric tons while landings by Spain tripled from over 1,000 metric tons and landings by UK doubled from 8,000 metric tons. The biological data available up to 1961 revealed no marked changes in length and age compositions and therefore, no changes were made in the fisheries assessments published in Supplement to ICNAF Annual Proceedings Vol. 11 (1961).

The landings of redfish increased to over 60,000 metric tons, and are now about three times the 1957/58 level. German trawlers took over 90% of the total catch. No major changes in the size compositions are evident from the data available.

## Subarea 2

Reports on researches in 1962 were submitted by the following member countries: Canada, Germany, Spain, USSR and UK.

### 1. Work carried out.

**a. Canada:** R/V *A. T. Cameron* and other research vessels. Hydrographic section from Seal Island across Hamilton Inlet Bank to continental slope, August 1-2. Cod tagging. Survey of cod abundance, size and age in relation to depth and temperature in August on Hamilton Inlet Bank. Sampling of research vessel catches and of the in-shore fishery.

**b. Spain:** Sampling of catches of cod on board commercial trawlers in 2J for length, age and maturity studies.

**c. USSR:** Research and exploratory vessels. Hydrography and exploratory fishing. Distribution of pelagic eggs and larvae of commercial

fishes. Quantitative distribution and seasonal population dynamics of zooplankton. Distribution of redfish by season and depth. Surveys on abundance of young cod and redfish. Results of cod tagging in 1960-62.

**d. UK:** R/V *Ernest Holt* visited Division 2J in November, worked the hydrographic section from Seal Islands across Hamilton Inlet Bank on November 26-27, surveyed the grounds for cod, took samples, and tagged cod. Continuous Plankton Recorder surveys. Sampling of commercial catches.

### 2. Hydrography.

The Canadian R/V *Investigator II* worked the Seal Island - Hamilton Inlet Bank section at the usual time, August 1-2. Surface temperatures, although higher than in 1961, were still lower than usual. Temperatures of the water on

Hamilton Inlet Bank (0.1 to 1.0°C) were lower than in 1961, and the cold intermediate layer contained more water with temperatures below -1°C. In the deep water at the continental slope temperatures were about the same as in 1961 (3.5 to 3.8°C).

The UK R/V *Ernest Holt* worked the Seal Island - Hamilton Inlet Bank section on November 26-27. From the coast seaward layers of water of salinity 32.5-34.5‰ lay over the continental shelf with a homogeneous mass (34.5 - 34.9)‰ over the continental slope. Compared with the temperature section in August by Canada, there was no water below 0°C, and temperatures generally increased with depth to just over 3°C on Hamilton Inlet Bank, and 3.5-4.0°C along the bottom on the continental slope.

Hydrological investigations by USSR show that in the first half of the year there was less water of polar origin than usual, and temperatures of the 0-50 m layer were similar to those of the warm year of 1958. In the second half of the year, the cold Labrador current intensified with the result that the sea off Labrador was colder than in 1961.

### 3. Plankton.

The USSR reported on studies of the quantitative distribution and seasonal population dynamics of zooplankton carried out in 1958-61. Boreal fauna zooplankton, especially *Calanus finmarchicus*, are the basic source of fish food in the area. The zooplankton biomass in summer is considerably higher than in spring and autumn. Phytoplankton blooms, followed by increases in zooplankton biomass, begin on the southern Grand Bank in March-April and gradually occur northward until reaching the Labrador area by August.

Continuous Plankton Recorder surveys were carried out by UK.

### 4. Fish Eggs and Larvae.

The USSR reported on surveys of eggs and larvae of cod, redfish and American plaice carried out off Labrador in 1959-61. Eggs and prelarvae of cod and eggs of American plaice were taken in June-July. In July-August redfish

larvae were found mainly over the continental slope. Also reported were eggs of the lemon sole, *Microstomus microcephalus*. This species had not previously been reported from the Northwest Atlantic.

UK gave information on redfish larvae obtained from the Continuous Plankton Recorder surveys.

### 5. Cod.

Canada continued its sampling of the inshore Labrador cod fishery during July and August, samples have been taken from the trap fishery in 2J, the jigger fishery in 2H and by jigger in 2G where there is no commercial fishery. Examination of the length and age data revealed that there has been no significant contribution to the inshore fishery by new year classes since that of 1953. Samples taken during a trawling survey on Hamilton Inlet Bank in August, on the other hand, consisted almost entirely of small fish of ages 3-6. These younger ages found in quantity offshore were apparently not available to the inshore fishery, and, conversely, the older age-groups which were most abundant inshore were scarce on Hamilton Inlet Bank. Cod tagging was resumed by Canada in 1962 mainly to study the inter-relationships of inshore and offshore populations. Cod were tagged on Hamilton Inlet Bank and at inshore localities of Labrador.

Germany reported a recapture on the northern slope of the Grand Bank (3L) in August 1961 from 114 cod tagged in November 1960 in 2J.

Spain sampled cod from commercial catches in 2J during May, August, September and October. The most frequent lengths caught were from 48 to 70 cm, but more small fish were prevalent in May than in the later months. The most numerous age groups were 4-6, but ages up to 14 were frequent and there was no real dominance of any particular year class. The growth rate is shown to be considerably slower in 2J than in the southern divisions. Spain reported a further recapture in 2J of a cod tagged by Denmark in Subarea 1. Two similar recaptures had previously been reported.

The UK survey in November found that most of the cod were between 40 and 55 cm.

Most of the cod stomachs were well filled with crustacea, mainly *Themisto* but also *Pandalus* and *Chionoecetes*. 372 cod were tagged.

From extensive USSR exploratory fishing, dense shoals of post-spawning cod were found in mid-April at 400-500 m in 2G. Cod of 53-68 cm (ages 7-10) prevailed in the catches. In the autumn cod were widely dispersed and smaller than in the spring. In May dense schools were found in 2H where the catches were dominated by 56-62 cm fish of ages 9-12 years. In autumn the very small catches were dominated by ages 6-8 years. In 2J both pre-spawning and post-spawning concentrations were prevalent in April-May. Most important in the catches were cod of 43-63 cm and 1955-57 year classes. Investigations were made to determine the abundance of young cod (up to 35 cm) in the subarea. Trawlings made in 2G and 2H by research vessels with small-mesh trawl showed that cod were dispersed over the whole area, averaging 25 specimens per 1-hour trawling. Proceeding southward, the catches of young cod steadily increased to a peak of 300 fish per hour trawling at 150-200 m on Hamilton Inlet Bank. Within the size range considered cod of 30-35 cm prevailed. Cod below 25 cm were scarce. The USSR tagged 1662 cod in 1960-62 in 2H and 2J. The 47 returns to end of 1962 show that cod migrate in summer from the offshore banks toward the coastal areas of southern Labrador and north and northeast Newfoundland.

## 6. Redfish.

In 2H the USSR redfish catches were dominated by fish of 30-40 cm in April-May. In 2J the January-May catches on pre-spawning and

spawning concentrations were represented mainly by males of 34-38 cm and females of 43-48 cm. In November concentrations were found on the northeast slope of Hamilton Inlet Bank, the dominant lengths being 32 cm for females and 35 cm for males. The distribution of young redfish below 15 cm was investigated, but no concentrations of young were found.

## 7. Status of the Fisheries.

Commercial fishing was carried out by Canada, France, Germany, Poland, Portugal, Spain, USSR, UK and Japan.

Cod landings of over 255,000 metric tons represent a slight decrease from the peak landing of 265,000 metric tons in 1961. Of the total cod landings from the subarea in 1962 over 225,000 metric tons were taken by trawlers. The development of this offshore fishery by trawlers was very rapid between 1958 and 1961, the annual average during 1955-58 being only 30,000 metric tons. Between 1936 and 1959 cod landings exceeded 100,000 metric tons in only one year (1953) when 111,000 metric tons were landed. The recent great increases in the landings is the result of substantially increased effort on great new deep-water concentrations in winter and spring. Correspondingly the effort for redfish decreased.

Redfish landings of about 8,000 metric tons represent a decline from the 1961 landings of about 26,000 metric tons, which was also substantially lower than the 83,000 metric tons in 1960. This fishery began in 1958 with an initial annual landing of 71,000 metric tons of redfish by Iceland and USSR.

## Subarea 3

Reports on researches in 1962 were submitted by the following member countries: Canada, France, Germany, Portugal, Spain, USSR, UK.

### 1. Work carried out.

a. **Canada:** R/V *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 (September-October). Cod tagging. Five hydrographic sections across the Labrador Current and continental shelf (July-August). Study

of hydrography of deep water south of Grand Bank (February-March and July).

b. **France:** R/V *Thalassa* survey cruise including St. Pierre Bank and Burgeo Bank.

c. **Germany:** R/V *Anton Dohrn*. Fish survey, especially cod, and hydrography, 3M and 3K, February 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-November) and from pair trawlers in 3Ps (February) and 3L (September).

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. **UK:** R/V *Ernest Holt* worked St. John's, Newfoundland - Flemish Cap hydrographic section, December 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-August 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.

The results of the UK (*Ernest Holt*) repeat of the St. John's Station's Flemish Cap-Grand Bank section, December 4-6, when compared with the St. John's Station's results obtained in July showed that there was still Labrador Current water below 0°C on 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 November 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 con-

siderably 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.

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 flow 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 layer (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.

UK 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.

UK 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.

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 (September) the size distribution was unimodal with size range of 40-73 cm, a peak at 46 cm and mean length 52 cm. In 3N (September) 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 curve 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 1963 Meeting Document 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 eastward 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 place 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 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.

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. In 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 Fisheries.

Commercial fishing was carried out by Canada, Denmark, France, Germany, Iceland, Italy, Norway, Poland, Portugal, Spain, UK, USSR, USA and Japan.

The cod landings in 1962 were 389,000 metric tons, a substantial decline from the 461,000 metric tons in 1961 and 471,000 metric tons in 1960. Despite an increase of about 10,000 metric 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 475,000 metric tons in 1954.

Haddock landings were 35,000 metric tons, a considerable decrease from the 80,000 metric tons

in 1961 and 66,000 metric tons in 1960. In the previous history of the haddock fishery only the landings of 1956 (84,000 metric tons) and 1955 (104,000 metric tons) exceeded those of 1961. The large decrease in 1962 is attributed by Canadian researchers to a decline in abundance due to the failure of year classes and poor recruitment.

Redfish landings were 61,000 metric tons, a further decrease from the 90,000 tons in 1961 and 99,000 metric tons in 1960. These landings repre-

sent a substantial drop from the peak landings of 246,000 metric 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 27,000 metric tons in 1962, about the same as those for 1961 but down from the peak landings of 35,000 metric tons in 1960.

### Subarea 4

Reports on researches in 1962 were submitted by the following member countries: Canada, France, Spain, USSR and USA.

#### 1. Work carried out.

**a. Canada:** R/V *A. T. Cameron* and other research vessels. Hydrographic sections off Halifax, across Cabot Strait and regular observations at coastal stations. Studies of water circulation on the Scotian Shelf and in the Gulf of Maine-Bay of Fundy area. Benthos communities in the Gulf of St. Lawrence (4T) in relation to sediment types. Zooplankton collections in 4T, and fish eggs and larvae in 4X. Surveys involving cod, haddock, redfish, pollock, American plaice and herring throughout the year. Studies of migration of 4T cod, life history of pollock, movement of larval herring in 4X and 4T and discards at sea of fish caught in commercial trawls.

**b. France:** R/V *Thalassa* (July-September) collected data on hydrography, redfish, silver hake, argentine and lobsters for studies of lateral and vertical distribution of species in relation to variable environmental factors in 4X, W and V.

**c. Spain:** A detailed study of the pairtrawl cod fishery in 4V and W; growth rates, age-composition and size-composition of cod stocks; conversion factors for translating dressed, salted weights to whole fresh weights, discards at sea and the possibility of increasing value of catches by using a greater variety of species of fish.

**d. USSR:** Scouting and fishing (July-December) in 4W for silver hake; scouting (April) and drift-netting for herring in 4V. Studies of

size composition of stocks, hydrography and fish eggs and larvae.

**e. USA:** Sampling commercial groundfish catches noting day-to-night differences; research vessel studies of benthic communities hydrography, currents and fish eggs and larvae; an intensive study of herring and co-operative research with Canada on haddock.

#### 2. Hydrography.

Canadian hydrographers recorded the lowest February water temperatures ever found on Emerald Bank but the summer temperatures in the Scotian Gulf were slightly higher than in 1961 but still below the long-term average. These trends are corroborated by observations reported by France, Spain and USSR. Patterns of surface and bottom drift are slowly appearing from current measurements and from returns of seabed drifters and drift bottles.

#### 3. Plankton.

Canadian Chaleur Bay (4T) sampling showed heavier summer zooplankton production than in 1961 but the species composition was the same. Much new information on distribution of fish eggs and larvae was assembled by USSR. If this work is continued and the results integrated with data being assembled by Canada and the USA, the factors influencing success of spawnings should soon begin to appear. Already there are signs that variable currents sweep some groundfish eggs out of the area.

#### 4. Benthos.

Canada is now mapping bottom sediments in 4T and describing and delineating communities of bottom fauna and USA is doing similar work in 4X. Results show how productivity levels change from place to place and may clarify problems of distribution, growth rates and feeding habits of fish.

#### 5. Cod.

Canadian data indicate that cod are being more and more heavily fished. Line fishing is becoming less important and trawling more important. Because of heavy fishing the catch per unit of effort is decreasing, large fish are becoming scarce, and Canadians are now using smaller fish than formerly. In spite of these long-term downward trends in abundance the mean size of cod is expected to increase slightly in 1963, because 7- and 8- year-old fish are more abundant than usual, and landings are expected to be maintained or increased to about 1959 levels, because of intensive fishing efforts. Tagging shows that 4T and 4S stocks mingle. Until now they were considered distinct. Inshore stocks fished with lines in 4V and W still seem to be distinct from those fished offshore with trawls. Clearer information on seasonal distribution or large and small fish and their migration patterns related to depth and temperature has been collected.

#### 6. Haddock.

The haddock is another intensively fished species that is protected by an ICNAF 4 1/2-inch mesh regulation. Compared with cod it is less common inside the Gulf of St. Lawrence than on the Nova Scotia banks. In 1962 it was more abundant on the western than on the eastern banks. In the winter, haddock were at 250 m in 4T and at 90 to 140 m in 4W. The 1958 year class seems weak and younger fish are also scarce. Prospects are that small (scrod) haddock catches will be poor for the next few years.

#### 7. Pollock.

Pollock have been little exploited in Subarea 4 but are becoming increasingly important to the Canadian fishery. They are less sought after by

European craft in the Subarea. Life history studies are producing results that should be helpful in making the fullest use of the species. It moves south in winter and spawns in the Gulf of Maine. Young fish are found inshore and move offshore when they are two years old and 20 to 25 cm long. They grow fast in the offshore areas but school separately from large pollock. Because of this, and because the fishery aims at taking only the large fish, mesh regulation is unlikely to have any "savings" effect. Pollock in commercial catches are smallest in western Nova Scotia, medium size around Grand Manan and largest on the north side of the Bay of Fundy. In this last area the growth rate is about the same as that in western Norway and faster than that in the Barents Sea.

#### 8. Redfish.

Much new information is being gathered by France, Poland, USA and USSR on abundance and depth of commercial-sized fish. They are generally scarce at the surface and down to 120 m but, below that, their abundance may not be much affected by depth although size composition may change. USSR observations on larvae are adding to our knowledge of the life history of the species.

#### 9. Herring.

Canada and the USA are interested in sardine-size herring in 4X. USSR is interested in adult sizes and did trial fishing in 4V and heavy commercial fishing in Subarea 5. It is not clear whether the stocks in 5 and 4X are distinct. For this reason intensive racial studies and observations on larval movements are under way chiefly by USA and USSR.

#### 10. Halibut, American Plaice, Great Silver Smelt and Silver Hake.

Canada has fisheries for halibut and plaice for many years. Canada and France are studying the great silver smelt (argentine) which are being exploited by USSR. The USSR fished silver hake on a substantial scale in 1962 and France did experimental fishing. New information was gathered on all four species including

size-composition of stocks, growth rates and life histories.

#### 11. Discards.

Records of discards at sea were received from Canada, Portugal, Spain and USA. More data are needed.

#### 12. Status of the Fisheries.

Commercial fishing was carried out by Canada, France, Italy, Portugal, Spain, USSR, USA and Japan.

The total groundfish landings of 397,000 metric tons were slightly above those of 1961 with Canada taking 60% of the total. There were only minor changes in landings of the major groundfish

species but there was a substantial increase in landings of "other groundfish". This is attributed largely to USSR catches of great silver smelt (argentinae) and silver hake and increased Canadian catches of pollock. The catch of cod also increased slightly to 219,000 metric tons but the Assessment Subcommittee was unable to determine from the data available whether this change should be attributed to changes in distribution of fish since 1961 or to changes in fishing effort.

Landings of pelagic species (124,000 metric tons) contributed substantially to the increased total landings from Subarea 4. The new USSR April driftnet fishery for herring in 4V (Banque-reau area) was partly responsible. No Norwegian porbeagle catches were reported from the Subarea in 1962.

### Subarea 5

Reports on researches in 1962 were submitted by the following member countries: Canada, France, Norway, USSR and USA.

#### 1. Work carried out.

**a. Canada:** Various research vessels. Hydrographic observations in the Gulf of Maine-Bay of Fundy area. Studies on pollock, herring and sea scallop.

**b. France:** R/V *Thalassa* exploratory cruise in Gulf of Maine and Georges Bank area for herring, haddock, silver hake.

**c. Norway:** R/V *G. O. Sars*. Studies on porbeagle (*Lamna nasus*) in Gulf of Maine (June-July).

**d. USSR:** Various research and commercial vessels. Four research cruises (March-December) in Georges Bank area studied oceanographic conditions and distribution, abundance and populations of herring and silver hake. Plankton studies.

**e. USA:** R/V *Delaware* and various commercial vessels. Oceanographic post observations. Release of drift bottles and sea-bed drifters. Benthic studies in Gulf of Maine. Analyses of commercial landings statistics for major species.

Sampling of landings for biological studies. Groundfish ecology and population dynamics. Pre-recruit haddock surveys. Analysis of yellow-tail flounder tagging data. Research on herring in Gulf of Maine and on Georges Bank. Studies of abundance of sea scallops.

#### 2. Hydrography.

The US continued its observation posts at lightships and towers. The temperatures in eastern New England waters were near normal during most of the year 1962. As compared with 1961, temperatures were somewhat higher during the first half of the year and slightly lower in the latter half.

The Woods Hole Oceanographic Institution has continued its drift bottle program in co-operation with the Fishery Research Board of Canada and with other institutions in the US. Monthly charts have now been prepared showing the direction and speed of surface drift and the percent of recovery from 30 minute rectangles.

A sea bed drifter program has also been inaugurated and is proving very useful in the study of bottom currents. Results suggest that the non-tidal drift along the bottom in the Gulf of Maine area is in the same direction, in general, as the surface drift, but about one-tenth as fast.

The USSR made a study of hydrographic conditions in the Georges Bank area during four cruises there from April-November.

### 3. Plankton.

The USSR carried out plankton studies during exploratory cruises from February to August. Spawning of *Calanus finmarchicus* was followed and Biomass values, which were determined throughout the period, reached a peak in July of 500-1000 mg/m<sup>3</sup>.

### 4. Benthos.

The US conducted benthic studies in the northern Gulf of Maine, and south of Martha's Vineyard and Nantucket Island. Based on the analysis of 100 samples of the northern Gulf of Maine, the macroscopic benthic fauna was found to average 80 grams per square meter of bottom. The fauna was particularly dense (300-1000 g/m<sup>2</sup>) off Penobscot Bay, Maine. General comparisons indicate that the Gulf of Maine benthos is only about half as dense as that occurring on Georges Bank. Preliminary results indicate the presence of 5 macro-benthic faunal communities. Biomass at the shallow, inshore stations was moderately low (20-40 g/m<sup>2</sup>), whereas over most of the shelf the biomass was moderate to very rich (50-300 g/m<sup>2</sup>). Exceedingly high faunal density (over 1000 g/m<sup>2</sup>) occurred at a few localities, usually associated with aggregations of mollusks.

The benthic studies program is providing a rich body of information on the distribution and abundance of bottom fauna which will be used in preparing charts of faunal types, and in providing very useful knowledge for an understanding of the nutritional support of our commercial bottom fish as well as an understanding of the ecosystem dynamics of the area.

### 5. Haddock.

Abundance of haddock on Georges Bank is now at a relatively high level due to strong year classes in 1958 and 1959. Abundance is expected to remain high until the summer of 1963 when serod abundance probably will decline because of the apparently weak incoming 1960 year class. Catches of young-of-the-year haddock in 1961

and 1962 fall surveys conducted by U.S. suggest that the broods for these years are also weak.

The first reports of the USA-Canadian cooperative study of haddock in statistical division 4X provides some interesting comparison with the haddock on Georges Bank.

The average age of haddock in the Browns Bank landings is higher than for Georges Bank. About 90 percent (by number) of first quarter landings from Browns Bank is composed of ages 4-8, whereas the same proportion of first quarter Georges Bank landings is composed of ages 3-7.

Catch curves based on first quarter age compositions show that recruitment into the spring fishery is completed between ages 4 and 5 on Georges Bank, and between ages 5 and 6 on Browns Bank. After full availability to the gear, the relative abundance of comparable ages in the spring appears to be substantially higher on Browns Bank than on Georges Bank. The estimated total annual mortality rate for age 6 and older is 42 percent for Browns Bank as compared to 50 percent for Georges Bank.

Georges Bank haddock grow faster than Browns Bank haddock and the average difference in length increases with age.

US scientists undertook a new study of the effect of fishing effort on the Georges Bank haddock stock. Analysis of data covering the years 1918 to 1960 indicates a definite drop in abundance (as measured by catch per standard days fished) with increasing fishing intensity.

The maximum sustainable yield is in the neighbourhood of 50 thousand metric tons and at the level of 5 to 6 thousand standard days fishing.

Recent levels of effort of over 8 thousand standard days probably exceed that corresponding to the maximum yield, and further increases in fishing intensity would not, in the long run, increase landings, rather, it seems more likely landings would decrease.

### 6. Redfish.

USA abundance indices for redfish in the Gulf of Maine, which have been maintained for many years, do not show any increase in abund-

ance during recent periods of light fishing intensity. Special studies in selected small areas in the Gulf show much the same trend. Abundance of redfish in the Subarea is not expected to change radically during the coming year.

### 7. Yellowtail Flounder (*Limanda ferruginea*)

Landings of this species were almost entirely by the US fleet and amounted to 25.6 thousand metric tons, a considerable increase over the 16.6 thousand tons landed in 1961. These high landings were the result of high abundance due to strong year classes in 1958, 1959 and 1960. These year classes will continue to support the fishery during the coming year.

Returns from the tagging experiment conducted by US in 1955, 1957 and 1959 have now been analysed. Of the 4,960 fish tagged there were 1,020 or 20.6 per cent recovered. Analysis of the returns shows a definite seasonal pattern of movement which repeated in each of the three years. There is an easterly migration in the spring and summer and a westerly return in the fall and winter.

### 8. Silver Hake (*Merluccius bilinearis* (Mitchill))

Studies of silver hake were conducted by USSR on silver hake sampled from commercial catches taken during the period April to October from the northwest edge and in the southwest area of Georges Bank in depths of 40 to 110 meters and in temperatures of 5.0° to 11.5°C. The bulk of the catch were 28-32 cm in length and 94.1% of the catch were fish belonging to the 1958 year class. This year class is expected to continue dominant in 1963 when fishing is expected to be good according to the USSR report. Different spawning times and vertebral numbers show that the Sable Island stock and Georges Bank stock are different.

Silver hake on Georges Bank fed on invertebrates, euphausiids and prawns, during their early life, but fish over 35 cm fed chiefly on small silver hake, haddock, and red hake.

The French reported silver hake in temperatures of 7° to 12°C on the northwest and northeast sections of Georges Bank.

### 9. Herring (*Clupea harengus* L.)

Research on herring was conducted by the US on an inshore stock of immature fish (the Maine sardine) and by the USSR on the Georges Bank stock of mature fish. The US research is summarized in 1963 Meeting Document 12. It covers the following three subjects: racial studies to determine the origins of the coastal Maine stock; age compositions and abundance studies with a view toward forecasting abundance; and environmental studies designed to shed light on factors controlling abundance and availability.

The USSR research is presented in Document 54. It includes description of age compositions of the Georges Bank stock in 1961 and 1962. The dominant year classes were 1955 and 1956. The modal size remained near 25 cm. Herring older than 9 years did not occur in the catches. Abundance decreased in 1962 and is expected to decrease further in 1963, having an adverse effect on the fishery. The average monthly catch per net varied from 90 to 550 kg in 1961 and from 12 to 192 kg in 1962. Although the number of vessels was much greater in 1962 the decrease in catch per net was probably not due to gear competition. The November 1962 catch per net was three times lower than for 1961 even though the number of vessels was several times less in that month than in the same month in 1961.

The USSR report also describes the feeding and distribution of herring in the spring and summer, the pre-spawning concentrations in the late summer and the spawning in the fall.

The fat content of the herring reaches a maximum of 16% in July and then decreased to 4.5% during spawning as the gonads develop. Further decrease to 1.4% occurs in April.

Age of maturity is 4 years. In 1961, spawning reached its height in September to October and took place in the northern part of the bank at depths of 50 to 150 meters. In 1962, spawning took place in the same area but the peak was observed somewhat later.

The French report records herring principally in cold water (6°-8°C) but also in warm water (14°-15°C) on the northern edge of Georges Bank probably due to the abundance of euphausiids.

## 10. Sea scallop.

Research has shown that the sudden increase in abundance of sea scallops on Georges Bank in 1959 was due to an unusually large year class that reached commercial size that year. This year class supported the fishery for four years. It is now declining and there appears to be no similar year class coming along. Thus we expect abundance to decrease in 1963. The decline in abundance was observed by both Canadian and US scientists working in the area.

Canadian biologists have had success in rearing sea scallop larvae, probably beyond the normal age of settling; a foot was developed but no larvae settled.

## 11. Porbeagle (*Lamna nasus*)

Studies of the growth rate, age composition and other biological information were continued in the Gulf of Maine in June and July by Norway. A report on the data collected is in preparation.

## 12. Status of the Fisheries.

Commercial fishing was carried out by Canada, Poland, USSR and USA. The total harvest of fish and shellfish increased from 489,000 metric tons in 1961 to 680,000 tons in 1962. This increase of almost 40% was due to the USSR more than tripling its landings of all species from Georges Bank. USSR landings of herring more than doubled while new and major fisheries were established for silver hake, cod, haddock, redfish and other groundfish species.

Landings of haddock in 1962 were over 89,000 metric tons compared with almost 52,000 metric tons in 1961. USA and Canada landings accounted for most of this increase although the USSR landed over 1,000 metric tons.

Landings of cod in 1962 were over 26,000 metric tons compared with almost 18,000 metric tons in 1961. USA landings accounted for only a part of this increase; Canada increased its landings to over 2,000 metric tons and USSR to over 5,000 metric tons. Poland took a minor quantity of cod.

Landings of redfish held steady at over 14,000 metric tons. A drop of over 1,000 metric tons in USA landings was compensated by USSR landings.

Landings of plaice remained at almost 2,000 metric tons while yellowtail landings continued its sharp upward trend and increased by 50% to almost 26,000 metric tons. Both species are fished almost entirely by USA.

Landings of silver hake more than doubled to a total of over 86,000 metric tons due to the 42,000 metric tons taken by the USSR, its first year in the silver hake fishery.

Landings of herring rose sharply from 94,000 metric tons in 1961 to almost 223,000 metric tons in 1962 due to great increases in landings by both USSR and USA.

USA landings of sea scallops dropped about 8% in 1962 while Canada's landings increased about 26%. Total landings were over 129,000 metric tons.

## PART 4

## Lists of Scientists and Laboratories engaged in the Commission's Work

## Canada

W. R. Martin	Assistant Chairman, Scientific liaison	Fisheries Research Board of Canada, Ottawa, Ont.
W. Templeman	Director, Groundfish biology and distribution	Fisheries Research Board of Canada, Biological Station, St. John's, Nfld.
A. M. Fleming	Groundfish statistics, cod	" " " "
A. W. May	Cod	" " " "
A. T. Pinhorn	Cod	" " " "
V. M. Hodder	Haddock, mathematical statistics	" " " "
E. J. Sandeman	Redfish	" " " "
T. K. Pitt	Pleuronectids	" " " "
H. J. Squires	Invertebrates	" " " "
J. L. Hart	Director	Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B.
J. C. Medeof	Offshore fisheries	" " " "
F. D. McCracken	Groundfish	" " " "
L. M. Dickie	Population dynamics	" " " "
A. C. Kohler	Halibut, cod	" " " "
P. M. Powles	Pleuronectids	" " " "
S. N. Tibbo	Pelagic fish	" " " "
R. A. McKenzie	Herring	" " " "
J. E. Paloheimo	Mathematical statistics	" " " "
N. F. Bourne	Sea scallop	" " " "
L. M. Lauzier	Hydrography	" " " "
N. J. Campbell	Oceanographer-in-Charge	Fisheries Research Board of Canada, Atlantic Oceanographic Group, Dartmouth, N. S.
R. W. Trites	Hydrography	" " " "
J. R. Chevrier	Hydrography	" " " "
D. H. Loring	Geochemistry	" " " "
D. L. Peer	Marine biology	" " " "
B. L. Blackford	Physical oceanography	" " " "
G. P. Cant	Physical oceanography	" " " "
D. E. Sergeant	Harp seal	Fisheries Research Board of Canada, Arctic Unit, Montreal, P.Q.
E. H. Grainger	Zooplankton	Fisheries Research Board of Canada, Arctic Unit, Montreal, P.Q.
A. S. Bursa	Phytoplankton	" " " "
Y. Jean	Director of Fisheries	Department of Industry and Commerce, Quebec, P.Q.
A. Marcotte	Director	Marine Biological Station, Grand-Rivière, P.Q.
P. Brunel	Bottom fauna	" " " "
J. Bergeron	Biology	" " " "
G. Lacroix	Zooplankton	" " " "
Y. Boudreault	Engineering	" " " "
R. Boudreault	Oceanography	" " " "

**Denmark**

P. M. Hansen	Chief, cod, statistics	Grønlands Fiskeriundersøgelser, Jægersborg Allé 1B, Charlottenlund Fiskeribiologisk Laboratorium, Godthaab, Grønland
Sv. Aa. Horsted	Groundfish	" "
J. Nielsen	Groundfish	" "
E. Smidt	Groundfish	" "
E. Bertelsen	Director	Danmarks Fiskeri-og Havundersøgelser Charlottenlund Slot, Charlottenlund
F. Hermann	Hydrography	" " "
S. J. Joensen	Groundfish	Fiskirannsóknarstovan, Tórshavn, Faroes

**France**

R. Letaconnoux	Haddock	Institut Scientifique et Technique des Pêches maritimes, Laboratoire de Paris, 59 Avenue Raymond-Poincaré, Paris (XVI <sup>e</sup> )
J. Dardignac	Biology-Hydrography, fishes	" " " "
A. Vincent	Biology-Hydrography, fishes	" " " "
Allain	Physical oceanography	" " " "
C. Nédélec	Redfish	Institut Scientifique et Technique des Pêches maritimes, Laboratoire de Bou- logne-sur-Mer, Quai de la Poste à Bou- logne-sur-Mer, Pas de Calais

**Federal Republic of Germany**

G. Dietrich	Director, Hydrography	Institut für Meereskunde der Universität Kiel, Kiel, Hohenbergstr. 2.
G. Krefft	Fishes, systematics and distribution	Bundesforschungsanstalt für Fischerei, Institut für Seefischerei, Hamburg- Altona 1, Palmaille 9
A. Meyer	Cod, Haddock, Greenland fisheries	Bundesforschungsanstalt für Fischerei, Institut für Seefischerei, Hamburg- Altona 1, Palmaille 9.
U. Schmidt	Saithe, redfish	Bundesforschungsanstalt für Fischerei, Institut für Seefischerei, Aussenstelle, Bremerhaven-F, F.A.Pust-Platz
J. Messtorff	West Atlantic fisheries, redfish, hydrography	" " "
A. v. Brandt	Director, fishing gear	Bundesforschungsanstalt für Fischerei, Institut für Netz-und Materialforschung Hamburg-Altona 1, Palmaille 9
A. Kotthaus	Redfish	Bundesforschungsanstalt für Fischerei, Biologische Anstalt Helgoland, Hamburg- Altona 1, Palmaille 9
M. Gillbriecht	Plankton	" " "

**Iceland**

J. Jónsson	Director, cod	Atvinnudeild Háskólans Fiskideild, Skulagata 4, Reykjavik
J. Magnússon	Redfish	" " "
J. Hallgrímsson	Zooplankton	" " "
Mrs. Thorunn Thórdardóttir	Phytoplankton	" " "
U. Stefánsson	Hydrography	" " "
Sv. Aa. Malmberg	Hydrography	" " "

**Italy**

G. Cannone Fisheries Ministero Marine Mercantile, Rome

**Norway**

G. Rollefson Director, marine biology Fisheries Directorate, Institute of Marine Research, Bergen  
 B. Rasmussen Arctic fisheries, seals " " "  
 J. Eggvin Hydrography " " "  
 S. Olsen Halibut " " "  
 E. Bratberg Cod Greenland " " "  
 O. Aasen Dogfish, porbeagle, sharks " " "  
 J. Hamre Tuna " " "

**Poland**

F. Chrzan Fisheries Sea Fisheries Institut Gdynia

**Portugal**

Tavares de Almeida President, statistics Comissao Consultiva Nacional das Pescarias do Noroeste do Atlantico, Avenida da Liberdade 211, 4°, D°, Lisbon  
 (Captain, Portuguese Navy)  
 R. Monteiro Cod Instituto de Biologia Maritima, Cais do Sodré, Lisbon  
 L. Dias Cod " "

**Spain**

O. Rodriguez Martin Fishes Direccion General de Pesca Maritima, Ruiz de Alarcon 1, Madrid  
 Orestes Cendrero Fishes " "  
 Vicente Bermejo Statistics " "  
 Antonio Figueras Fishes, otoliths Inst. de Investigaciones Pesqueras, Laboratorio de Vigo, Orillamar 47, Vigo

**Union of Soviet Socialist Republics**

A. S. Bogdanov Population dynamics All-Union Research Institute of Marine Fisheries and Oceanography (VNIRO), 17 V. Krasnoselskaya, Moscow  
 T. F. Dementjeva Population dynamics " " "  
 A. A. Elizarov Hydrography " " "  
 G. K. Izhevsky Hydrography " " "  
 A. B. Kusmitchev Fishery statistics " " "  
 Ju. Ju. Marty Fishery biology (herring) " " "  
 A. I. Treschev Fishing gear technology " " "  
 V. B. Shparlinsky Fishery statistics " " "  
 E. V. Vladimirskaia Plankton " " "  
 L. N. Pechenik Fishery biology, cod, haddock, redfish Polar Research Institute of Marine Fisheries (PINRO), 6 Kolskaya Street, Murmansk  
 G. P. Zakharov Fishery biology, cod, haddock " " "  
 A. P. Noskov Fishery biology, cod, haddock, redfish Atlantic Research Institute of Marine Fisheries and Oceanography (ATLANT-NIRO) 5 Dmitry Donskoy Street, Kaliningrad  
 S. A. Studenetsky Fishing gear technology " " "  
 A. A. Volkov Fisheries law State Fisheries Committee for the USSR Moscow

**United Kingdom**

C. E. Lucas	Director, fishery ecology	Marine Laboratory, Victoria Road, Torry, Aberdeen, Scotland
J. H. Fraser	Plankton	" " " "
B. B. Parrish	Population theory	" " " "
Z. Kabata	Fish parasites	" " " "
A. D. McIntyre	Halibut	" " " "
D. F. S. Raitt	Redfish	" " " "
R. Jones	Haddock	" " " "
J. H. Steele	Hydrography and productivity	" " " "
R. J. H. Beverton	Population theory	Fisheries Laboratory, Lowestoft, England
A. J. Lee	Hydrography	" " " "
J. A. Gulland	Demersal fish (sampling)	" " " "
J. Corlett	Plankton	" " " "
R. W. Blacker	Otolith reading techniques	" " " "
J. Ramster	Hydrography	" " " "
B. C. Bedford	Demersal fish (ageing)	" " " "
R. S. Glover	Director, plankton	Oceanographic Laboratory, Edinburgh Scotland
G. T. D. Henderson	Plankton	" " " "

**United States**

J. L. McHugh	Chief	Division of Biological Research, Bureau of Commercial Fisheries, Washington, D.C.
Joseph King	Chief	Branch of Marine Fisheries, Bureau of Commercial Fisheries, Washington, D.C.
J. T. Gharrett	Regional Director	Bureau of Commercial Fisheries, Gloucester, Massachusetts
J. B. Skerry	Management	" " "
D. L. Hoy	Statistics	" " "
H. W. Graham	Laboratory Director	Bureau of Commercial Fisheries, Woods Hole, Massachusetts
R. L. Edwards	Fishery biology	" " "
R. L. Fritz	Groundfish	" " "
M. D. Grosslein	Haddock	" " "
R. C. Hennemuth	Population dynamics	" " "
A. C. Jensen	Cod	" " "
G. F. Kelly	Redfish	" " "
F. E. Lux	Flounder	" " "
J. A. Posgay	Sea scallops	" " "
R. L. Wigley	Bottom ecology	Bureau of Commercial Fisheries, Woods Hole, Massachusetts
D. F. Bumpus	Hydrography	Woods Hole Oceanographic Institution, Woods Hole, Massachusetts
B. E. Skud	Laboratory Director	Bureau of Commercial Fisheries, Boothbay Harbour, Maine
V. Anthony	Population dynamics	" " "
H. C. Boyar	Herring biology	" " "
J. J. Graham	Herring ecology	" " "
K. Sherman	Zooplankton	" " "
A. T. Stickney	Herring behavior	" " "
J. E. Watson	Herring biology	" " "