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ANNUAL MEETING - JUNE, 1963

Meeting of Scientists from Canada and the United States
St. Andrews, New Brunswick,
December 4-6, 1962.

Participants.

John Hart, Chairman: L. R. Day and H. W. Graham, Rapporteurs. From Canada: W. R. Martin, F. D. McCracken, Y. M. Jean, R. A. McKenzie, S.N/ Tibbo, L.M. Lauzier, E. Cadima, L.M. Dickie, J. C. Medcof, N. F. Bourne, P.M. Powles. From the U.S.A.: V. Anthony, J. Graham, C. Sindermann, H.C. Boyer, B.E. Skud, D. Bumpus, R. C. Hennemuth, J. A. Posgay, E. B. Haynes. From ICNAF Secretariat: E. M. Poulsen.

Herring

The United States.

A herring review was initiated by Mr. Skud who pointed out that there exists a background of knowledge regarding sardine herring along the coastal waters of Canada and the United States as a result of considerable effort put into this research on the part of the Canadians in the past, and as a result of joint efforts of the United States and Canada in connection with the Passamaquoddy Power Project Studies. He indicated several published summaries of these researches.

He then outlined the nature and scope of the research program now under way in the U.S. This research which is centered at the Boothbay Harbor Laboratory of the U.S. Bureau of Commercial Fisheries is now being expanded so that within six months the staff employed in this research will include 10 - 12 professional persons along with supporting personnel.

Dr. Sindermann, who is in charge of this program, then described briefly the various approaches which the staff was taking in meeting the problems posed by the herring of Georges Bank and the Gulf of Maine. The Herring Program is divided into the following projects: Abundance and Availability of Sardine Herring, Biostatistics, Subpopulations, Behavior and Migrations, Offshore Populations. Most emphasis is being placed on the first two projects.

A good statistical system is in operation. This was established in 1947, and provides for detailed information on all catches taken by U.S. fishermen and on catches taken in Canada and imported to the U.S. for processing. Abundance of the sardine herring is difficult to estimate since there is evidence that availability to the traps or inshore seines is extremely variable. Success has been achieved in age reading of otoliths so that age determinations can now be made of fish three years old and younger. The U. S. catch is being sampled for age composition of the sardine herring sizes.

Subpopulations of herring are studied through serological techniques and some meristic work. A new blood group has been found which is a valuable addition to the many factors which must be used to differentiate the subpopulations in the Gulf of Maine. So far nothing has been found to associate the Maine sardine herring definitely with Georges Bank herring.

In respect to migration studies, it is hoped that a long lasti tag can be developed that can be applied to the young, and that can later be identified in spawning populations. In this way some ligh may be shed on which spawning stocks provide the offspring for the inshore sardine herring populations.

Offshore populations are studied for age structure and other population characteristics of all known spawning groups, and intensive sampling of the Georges Bank area for adult and larval herring is under way.

Subpopulation research is concerned with definition of herring stocks and determining relationship of immature coastal herring with spawning aggregations. Methods include certain meristics, serology, natural and artificial tags.

Behavior and migration studies concentrate on understanding the nature of and reason for the inshore movements of immature herring The final experimental phases in development of a suitable long-term herring tag should be completed this winter, and a major tagging effort is planned.

Dr. Joseph Graham reported on an ecological program designed to determine the environmental factors that control or affect the abundance and availability of herring. These studies are divided into two parts: (1) surveys in the Sheepscot-Boothbay-Damarascotta area of Maine where 18 stations are established in three somewhat different environments: Lower estuary, Bay area, and combined weak lower estuarine and Bay and, (2) surveys inshore along the Maine Coast. Measurements are made of temperature, salinity, density, currents, transparency, and plankton collection are made monthly. There appears to be a peak in abundance of larvae during the period September-November and sometimes a secondary peak. The collected data are being analysed to determine the critical period in the life history as related to environmental conditions.

Canada.

Mr. Tibbo reported on the Canadian herring investigations. Th present program includes a good system of statistics in the Bay of Fundy which provides data on the distribution of catch by types of gear, as well as the time and location of each catch.

Larval surveys were made in the Bay of Fundy, chiefly in the St. Mary's Bay area, to follow the relative abundance, dispersal, growth of herring larvae from the southwest Nova Scotia spawning grounds. Spawning surveys were designed to map all herring spawnings in the southwest Nova Scotia and Bay of Fundy areas.

In a tagging program designed to study possible movements from one side of the Bay of Fundy to the other, 12,000 herring were tagged 1962. The commercial sampling program consisted of weekly samples taken chiefly at Yarmouth and Black's Harbour to provide information on length, weight, age, growth, vertebral numbers, sex and maturity, and hatching season.

Offshore studies included two cruises to Georges Bank for information on the distribution of herring along the northern edge of Georges Bank. Samples were taken for length, age, sex and maturity and hatching season.

Mr. Tibbo pointed out that future plans call for a reduction in the effort devoted to herring research due to a change of emphasis in the Canadian pelagic research program; more time will be devoted to the study of swordfish, tuna, and sharks. The following herring work will be carried out: landings statistics will be collected as at present;larval surveys will be reduced to monitoring one station in

St. Mary's Bay; spawning surveys will be discontinued; no field taggings will be conducted, but attempts to develop a more useful tag will continue in the Laboratory; sampling of commercial catches will be reduced to about 25 percent of present levels; the offshore survey will be conducted as in the past year.

Cooperative Agreements.

Following this report, the chairman asked Mr. Tibbo and Mr. Skud to serve as a subcommittee to work out a cooperative sampling program which would insure adequate coverage in the next few years. This subcommittee later reported that such a program had been agreed upon. Canada will expand its sampling for lengths only. This program will include weekly samples from fishery officers' districts throughout the Bay of Fundy area. The U.S. will expand its sampling program to include bimonthly samples in the Passamaquoddy area and irregular sampling in southwest Nova Scotia. In this way it is believed that no serious gaps will occur in the sampling series.

There is still a problem of standardization; in measuring fish, the U.S. and Canada using different methods. It was agreed that U.S. and Canadian biologists would meet before May in an attempt to resolve these differences.

Agenda for the May Meeting.

After some discussion the following agenda was proposed for the meeting on herring to be part of the agenda for the Scientific Advisors to Panel 5.

1. Report by countries of research conducted and general plans for the future. These reports to include bibliographies of published and unpublished reports by each countries' nationals, the unpublished items to be so labeled, (whole ICNAF area).

2. Plans for the exchange of information and coordination of effort.

3. Standardization of techniques and nomenclature and tag returns.

Environmental Studies

United States.

Bumpus reported on environmental studies conducted along the Atlantic Shelf. The oceanographic observation posts set up on 1955 continue to provide daily observations of surface temperature and salinity, bottom observations weekly, and drift bottle releases daily.

Information on the surface and bottom currents is being obtained through the release of drift bottles and Woodhead sea bed drifters from research vessels and weather ships.

The back accumulation of bathythermograph records for the area is being analysed and monthly mean temperature charts are being prepared for a series of depths.

The activation of the new research vessel Albatross IV will greatly accelerate the investigation of environmental conditions in Subarea 5. The vessel's entire research time will be spent in the Georges Bank-Gulf of Maine area. A series of 14 cruises are planned, on all of which some environmental data will be collected. Three of the cruises are designed especially for observing environmental conditions such as temperature, salinity, phosphate content, oxygen, and plankton.

The Boothbay Harbor Laboratory is conducting environmental research in connection with its herring research. This program includes a grid of stations along the central coast. Hydrography, plankton, and bottom trawling are included. Interest here is in determining the nature of the inshore environment of herring, and how it changes seasonally and annually. Another major aspect of the work includes periodic cruises along the northern New England coast, particularly concerned with herring larval distribution and abundance.

Canada.

Lauzier reported on the oceanographic studies conducted by the St. Andrews Laboratory. Environmental factor studies in the Gulf of Maine - Bay of Fundy area are the non-tidal drift, as inferred from drift bottle and sea bed drifter recoveries and from the temperature-salinity variations.

Environmental research is conducted under two projects: the monitoring project and the environmental cruise project in relation to herring larval drift. The monitoring non-tidal project was started on a small scale under International Passamaquoddy Fishery Board and enlarged to the present scale in 1960. The monitor temperature-salinity project was started in the 20's and gradually enlarged to the present scale in 1950. The results of the monitor project show marked year-to-year variations in the surface non-tidal drift and trends in surface and bottom temperature (cooling trend from the mid-fifties to the present time).

The non-tidal drift data from the environmental cruise project are analysed in an attempt to estimate the contributions into, and escape from, two main areas, St. Mary's Bay and Quoddy.

It is planned to continue the monitor project at about the present scale, but to discontinue the environmental cruise project in relation to herring larval drift in June 1963, when the biologists will discontinue the St. Mary's Bay project.

Agenda for May Meeting.

The following agenda was suggested for the May meeting of the Scientific Advisors to Panel 5:

1. Definition of the environmental problems in the Gulf of Maine and on Georges Bank.

2. Reports by countries of environmental research conducted in the area in 1962.

3. Reports by countries on environmental research planned for the future.

4. Development of a long range research program for the area.

Sea Scallops

Abundance.

Posgay reported on U.S. studies. In the Calendar Year 1962 Canadian effort on Georges Bank was about 6000 days while U. S. effort was 9000 days. Canadian landings increased from 10 million pounds in 1961 to 12 million pounds in 1962, while the U.S. catch decreased from 26 million pounds to 22 million pounds; the total combined catch of the two countries decreasing from 36 million pounds in 1961 to 34 million pounds in 1962.

This total decrease was due to decreased abundance and the decrease is expected to continue throughout 1963. Measure of abundance based on research vessel sampling and on the catch per day of commercial vessels both indicate that the landings in 1963 will probably be down 30 to 40 percent. Research vessel samples were taken in 25 unit areas in May of 1961 and 1962, and in 20 unit areas in September 1961 and 1962. These comparisons show an average decline of 40 percent in numbers of scallops larger than 70 mm. The year classes recruited in 1960, 1961, and 1962, were all much smaller than the unusually large year-class recruited in 1959, and there is no indication that the year-class that will be recruited in 1963 will be above average. The catch per day of U. S. vessels averaged about 1600 pounds during the period 1948-1958. It then rose to 3000 pounds in 1960 and is, at present, at a level of about 2300 pounds. It is expected to drop to 1600-1800 pounds per day in 1963.

Bourne reported on Canadian studies. Results of two sea sampling trips show agreement with U.S. results that abundance is down substantially from last year. Limited sampling indicates that the incoming year-class for 1963 is not large. Canadian landings for 1962 will exceed those of 1961, but this will be due to increased effort, the Canadian fleet having expanded from 28 to 39 boats. All boats are fishing harder, moving around much more than in the previous year, and the shucking crews are able to keep up to the fishing power of the boat which they were not able to do during the past few years.

Total Mortality.

Posgay reported that the U.S. has now accumulated mortality data for 85 pairs of unit areas and for 4 pairs of years. These studies indicate an average total mortality rate of about 50 percent on an annual basis ($Z = 0.7$).

Bourne reported that preliminary analysis of sea sampling trips in 1960, 1961, and 1962 showed a pronounced decline in the catch per unit of effort. Using catch (in bushels) per tow per drag per minute as the unit of effort, the catch has decreased from 1.93 in 1960, to 0.58 in 1961, and 0.39 in 1962. Canada is undertaking a similar analysis of log book data in the hope of obtaining further information of this type. It is hoped that the log book data will be useful for this purpose back to 1958.

Natural Mortality.

Posgay reported that Arthur Merrill has made an intensive study of clapper shells on Georges Bank with special reference to determining the time of death. Large numbers of clapper shells are found in a few relatively small areas. They appear to have accumulated in these areas over a long period of time and are not the result of mass mortalities. Some of the pairs of valves have remained attached for as long as two years. Fouling organisms frequently form at the hinge and effectively cement the two valves together after the ligament has deteriorated. The shells themselves disintegrate in about three years. These studies substantiate previous opinion that natural mortality is low.

Bourne reported that Canadian scientists undertook no new research in this field in 1962. They concurred with results of U.S. investigators that clappers remain as such for longer than 100 days, possibly up to one year. Nineteen sixty-two sea samples showed clappers comprised a small percentage of the total catch (less than 10 percent) except in three unit areas where they were as high as 40 percent of the total catch. These high frequencies are not regarded as real evidence of mass mortalities.

Gear Studies.

Posgay reported on an analysis of U.S. and Canadian gear select' data collected on experimental cruises of the Delaware and Cape Eagle. When the data for all linkages are pooled and then grouped by 5 mm. intervals, the results show for the 80 mm. size a 50 percent reduction in catch when comparing a 4 inch ring with a 3 inch ring. For the sizes 95-110 mm. there is a reduction of 20 percent with the 4 inch ring as compared with the 3 inch ring, and a reduction of 60 percent when the 5 inch ring is used. In the sizes 110-125 mm. the catch with the 4 inch ring is greater than with the 3 inch ring, and only a slight reduction when the 5 inch ring is used. The results are thus confusing. Apparently larger rings are more efficient for all sizes, but other conditions such as the amount of trash in the catch are so effective as to mask any selectivity which is intrinsic to the gear. As a consequence it is impossible to predict the effect of any given mesh size on the catch of scallops on any particular population of shellfish.

Canadian biologists agreed with these conclusions and the group concluded that they could not recommend increasing ring size in present scallop dredges as a means of permitting escape of "undersized" scallops. It was agreed that some new approach is required. Canada reported that she has initiated studies of scallop behaviour and fishing gear. This long-term project may eventually lead to radical changes in gear desig for selective fishing of marketable scallops.

Other projects.

Haynes reported on U.S. tank experiments on sea scallops. An experiment designed to test the effect of tags on the movement of scallops showed that the streamer tag now in use does not inhibit movement. In the course of this experiment it was discovered that sea scallops are positively phototropic and there are indications that the animals are sensitive to ultra violet light. In other experiments it was found that scallops react to low frequency sound.

Bourne described larval rearing work conducted by Canada. Scallops were spawned and larvae maintained for as long as 58 days and grew to 288 microns in shell diameter. However, they did not settle and hence the duration of the larval stage is not known. Results of preliminary predator studies were reported. Striking differences in the meat weight of animals of the same shell height from two localities 15 miles apart on Georges Bank were reported.

Program for 1963.

The U.S. will conduct two research cruises to Georges Bank to obtain information on abundance and mortality rates. Accumulated data on growth rates will be analysed. A new dredge will be designed for experimental sampling, and an underwater camera will be used for survey work if resources permit. Larval studies will be initiated.

Canadian biologists do not intend to initiate new research projects in 1963. They will continue with the log book coverage and the collection of catch and effort statistics. Most of the effort will be devoted to analysing data already on hand. This work will emphasize: the variability of scallop populations within a unit area; effects of the fishery on scallop stocks; study of catch per unit of effort since 1958 from log book studies; larval studies and studies of juvenile stages to devise better ways of measuring and predicting changes in recruitment. Gear research will be conducted to study the efficiency of different types of dredges.

Next Meeting.

It was decided that the next meeting to discuss sea scallop research should be held during the 13th Annual Meeting in Halifax.

Canadian-United States Cooperative 4x Haddock Program

Hennemuth submitted a report, co-authored by M. D. Grosslein, on a preliminary analysis of abundance, size and age composition of commercial landings of haddock caught off southern Nova Scotia by U.S. and Canadian fisheries from 1957 to 1961. Analysis was based on joint collections of statistics of landings and effort, and samples of length and age frequencies of the landings. The report contained a gross description of the commercially exploited stock and drew attention to the need for more adequate sampling in Division 4X. A more refined analysis is in preparation for publication.

Following discussion, it was agreed:

1) that the problem of ICNAF Division 4X and subarea 5 haddock stock characteristics and interrelationships warranted further joint study in Division 4X;
2) that Canada and the U.S. would continue collecting catch and effort statistics for Division 4X and attempt more adequate sampling of length and age frequencies from their respective commercial fisheries in this region;
3) that Canada would send length samples and scale or otolith samples to U.S. on a quarterly basis while U.S. would send the age composition data to Canada on an annual basis.
4) that Canada and U.S. would continue to take otoliths for age determinations of Division 4X haddock. For age determination of Subarea 5 haddock, Canada would continue to collect scales only;
5) that U.S. would provide back calculated lengths prepared by J. Wise from Browns Bank haddock for Dr. Dickie's study of apparent changes in growth rate.

Review of ICNAF Assessment Report for Haddock, Cod, Plaice, and Pollock

McCracken summarized observations on Sable Island Bank and Emerald Bank haddock (Division 4W) in relation to mesh assessment work. Surveys with small mesh nets in 4W during 1961 and 1962 indicate that pre-recruit 1958 and 1960 year-classes were well below average in numbers and that th 1959 year-class was about average. Landings of about 20,000 metric tons from 4W in 1960 and 1961 were virtually all taken by Canadian vessels. The extraordinarily abundant 1952 year-class had almost disappeared from the fishery and landings in 1960-61 relied mainly on the 1956 and 1957 year-classes. As a result, scrod made up a high proportion of the landings.

Attention was drawn to the difference in the optimum mesh size determined by the ICNAF Assessment Group in areas such as 4W and 4X, wher biological parameters, such as growth, etc., are similar. Comparison wit assessment for haddock in Subareas 5 and 3 suggest a need for considering a more uniform treatment of discard estimates.

Jean summarized observations on Gulf of St. Lawrence (4T and 4V north) cod in relation to mesh assessment work. The trend towards smaller sizes and lower catch per unit effort continues for both line and otter trawl summer fisheries by Canadians (line cod averaged 4.5 lb. in 1961, dragger cod 2.4 lb. in 1962). Increase in fishing effort has reduced abundance of large cod. Slower growth rates are also a contributing factor to the current small sizes of cod landed. Similar changes in size composition are evident in the European spring fishery in 4V north, but catch per unit effort has not shown the marked decline seen in the Canadian fishery. Recent surveys show that the commercial size cod (modal size 52 cm) congregate in deep water (80 to 120 fm) in the southern part of 4T and in 4V north in late winter and early spring, and are the basis of the European trawl fishery. In summer the commercia fishery is generally found in shoaler water over a great depth range (15-80 fm). These differences in depth distribution and concentrations during the two fishery periods may account for the differences in trends of catch per unit effort.

With continuing decrease in mean sizes landed in 1961 and 1962 an increase in mesh size from 4-1/2 inches would cause greater immediate losses than those suggested in the ICNAF Assessment Report. Long-term benefits may differ for the Canadian and European components of the fishery and may be lower than recorded. It was pointed out that recommended optimum mesh sizes as a result of assessment were useful only for present fishing situations and that future trends in the fishery have a great bearing on this usefulness. It was agreed that there was a need for reassessment of optimum mesh sizes for division 4T.

Powles reported on survey and tagging results for plaice in 4T and 4V north. Results indicate short seasonal movements take place into deep water along the Laurentian Channel in January - March. No emigration from 4T occurred, and while clines exist from north to south, two poorly defined stocks were evident. Little mixture took place between the Cape Breton stock (4T south - 4V north) and the Miscou stock (4T north). In both areas the numbers of large fish landed have decreased since 1947, but no changes in growth rate have been observed since 1952. Mortality due to wastage at sea is high, and varies with the relative abundance of younger year-classes. For a 4-1/2 inch mesh codend from 1957-61, wastage varied from 59 to 85 percent by number and 23 to 64 percent by weight. Releases by a 5-3/4 inch mesh would reduce these figures to 39 to 62 percent by number and 18 to 50 percent by weight. The 50 percent selection point of a 6 inch mesh would correspond to the current 50 percent cull length, and wastage would be further reduced by the use of such a mesh size.

Estimates of total mortality varied from .33 to .85 depending on the area, and calculations of growth rate and natural mortality have been completed.

Dr. Steele's paper on the biology of pollock was summarized. Pollock are found in greatest abundance at the mouth of the Bay of Fundy (4X) during summer and off Cape Cod (Subarea 5) and Browns Bank (4XO) areas in winter. Adult fish school in waters warmer than 1°C. Young pollock are found close to shore in Canada, particularly on the south coasts of Nova Scotia, New Brunswick and Newfoundland. Pollock grow rapidly on Euphausids in the Bay of Fundy and on fish in Nova Scotian Shelf area. Commercial fisheries land large fish, mainly above the selection range of 4-1/2 inch mesh otter trawls.

Effects of Minimum Meshes on Demersal Species other than Cod and Haddock

Martin presented a report on relative abundance and size composition of the various species of fish taken in survey and commerci otter trawling from Division 4T to 4X. The studies are providing data for fishery assessment in relation to mesh regulation. Small unmarketable fish of the species already under regulation, cod, haddock, and flounders, are released in large numbers by large-mesh nets. Other demersal species are not as effectively sorted by large-mesh nets. Some species (skates, dogfishes, pollock, catfish, cusk and goosefish) are mainly large in size for both survey and commercial otter-trawl catches. Relatively few are released by large-mesh nets. Other species (mackerel, herring, silver hake, argentines, capelin, sand launce, sculpins, eelpouts, and grenadiers) are of small average size, and most of them are released by large-mesh (4-1/2 inch manila) nets. As the human demand for fish protein increases, some of these small fish will become useful to the fishing industry and small otter-trawl meshes will be required to take them. It is accordingly important to intensify our studies of species distributions, abundances, and associations as background for future decisions on management of the major ground-fishing areas. Meanwhile, there appears to be little point in continuing with intensive mesh-selection experiments in Subarea 4. One exception to this generalization is for redfish, where studies of effects of minimum mesh sizes throughout the southern part of the ICNAF area may be worth while.

Graham (U.S.) submitted a report concerning the small haddock of Subarea 5 in which it was demonstrated that (1) small haddock are not taken in appreciable numbers by vessels using 4-1/2 inch mesh, (2) an increasing quantity of haddock is being taken under the 10 percent annual exemption, (3) the industrial trawl fishery which is not now active landed quantities of small haddock during the years 1957-59.

It was concluded that the drain on the small haddock is not an immediate problem, but that industry plans for reactivation of the industrial fishery requires that studies of the effect of small mesh fishing be continued.

Discussion of the reports under this item followed and it was agreed:

1) that U.S. prepare a report for the Scientific Advisers to Panel 5 on the effect of the application of minimum mesh sizes for species other than cod and haddock which might minimize the incidental catch of small cod and haddock by the whiting and industrial fisheries;

2) that serious consideration should be given in ICNAF to the value of emphasizing other approaches than mesh assessment to the problem of obtaining maximum sustained yield from the fisheries in the Convention Area. The need for a broader approach to species interrelationship was evident because of the complexity of the management problems in mixed fisheries and the lack of information on the association and relationships between species and between stocks of the same species. Information is required on the distribution of fish species in space and time, the distribution of fishing effort in relation to the distribution of species, and the effect of changing the level and distribution of effort. There is a need to know the maximum productivity of the Convention Area and how much drain fishery production has on this productivity.

1963 Programming.

Dr. Graham (U.S.) reviewed a tentative cruise schedule for Albatross IV for calendar year 1963. The schedule included:

1) 3 Groundfish surveys - N.S. to Hudson Canyon - Winter (Jan. 29 - Feb.25), Summer (July 9 - Aug.6), Autumn (Oct. 4 - Nov.14).

2) 3 Oceanographic surveys - N.S. to Hudson Canyon - Winter (Mar. 4 - 18), Spring (Apr. 16 - 30), Autumn (Sept. 24 - Oct. 4).

3) 4 Ecosystem dynamics surveys - N.S. to Hudson Canyon Winter (Mar. 4 - 18), Spring (Apr. 16-30), Summer (June 19-28), Autumn (Sept. 24 - Oct.4).

4) 2 Scallop surveys - Georges Bank - Spring (May 7 - 16), Summer (Sept.3 - 12).

5) 3 Gulf of Maine surveys - Cod (Jan.8-18), Haddock (Mar. 26 - Apr.4), Midwater distribution (Aug. 13 - 22).

6) 2 So. New England Studies - Benthos (May 26 - June 12), Underwater TV Camera (Nov.25-30).

Dr. Martin (Cda.) reported on St. Andrews cruise plans for the A. T. Cameron in 1962. They included 4 groundfish cruises:

1) Halibut - Grand Banks area, (early February).

2) Cod - Cape Breton area, (late February).

3) Haddock - Emerald Bank area - (early March).

4) Haddock and other species (hake, pollock, argentine, etc.) - S. W. Nova Scotia, (late March).

5) Pelagic species - Gulf of Maine and N.S. Banks, (Aug.).

During further discussion, it was agreed that U.S. and Canada would exchange species composition and length composition data for research vessel operations in Division 4X in the form of IBM Tabulations. United States agreed to send Canadian cruise tracks and plans for cruises in S.W. Nova Scotia area. Canada agreed to obtain haddock blood for serological studies and haddock for fecundity studies by U.S. from Browns Bank area. Canada agreed to send U.S. cruise plans for the Harengus. Invitations were extended from both U.S. and Canada to have visiting scientists take part in cruises when accomodation was available.
