

Trade News



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COVER PHOTOGRAPH: British Columbia salmon trollers and gillnetters.

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A New Digger for Soft-shell Clams

By J.S. MacPHAIL and J.C. MEDCOF

MECHANIZED methods of harvesting shellfish will likely replace manual methods, slowly but surely. The new harvesters vary greatly in design and cost, depending on the species fished and the intended scale of operations. But almost all those built for harvesting the burrowing types of shellfish now make use of water jets to remove them from the soil.

THE HYDRAULIC RAKE

The simplest and least costly of the new harvesters is the hydraulic rake. This was developed by clam fishermen on Martha's Vineyard, Massachusetts, U.S.A., for harvesting soft-shell clams from saltwater ponds. Water to operate the rake is forced from an engine-driven pump floated in a dinghy, through a hose, down the handle of the rake and escapes through nozzles which are the tines of the rake. When the nozzles are dragged through the soil the water jets bring clams to the surface of the soil where they can be picked up.

In 1959 when we first heard about this development we were immediately interested. Our own industry needed a cheap harvesting tool that would take the drudgery out of clam fishing and be less damaging to clam stocks than the conventional clam fork. And in 1960 the Fisheries Research Board of Canada, with financial support from the Industrial Development Service of the federal Department of Fisheries, built a hydraulic rake and studied its performance under experimental conditions and in commercial-type operations.

PHYSICAL PRINCIPLE IN HYDRAULIC RAKING

In descriptions of the hydraulic rake we had been told that it washed clams out of the soil. This is true but somewhat vague. Our experiments showed what actually happens. The water jets temporarily convert the upper layers of the clam flat from their solid to a fluid state. This fluid soil-water mixture is heavy and the clams in it, being light, pop up like corks. When the rake passes, the flat slowly returns to its solid state.

Mr. MacPhail and Mr. Medcof are on the staff of the Fisheries Research Board of Canada, stationed at the Board's biological station at St. Andrews, N.B.



Fishing clams in about $2\frac{1}{2}$ feet of water with the new hydraulic digger. The pump assembly is floated in a dinghy and the operator walks slowly backward wheeling the digger over the clam bed.

The tests also showed that the water jets could be modified in many ways and still be effective in harvesting so long as they brought about this essential solid-to-fluid conversion of the surface layers of the clam flat.

FEATURES OF PERFORMANCE

We found the Massachusetts hydraulic rake a rather cumbersome machine but there were almost no broken clams in the catches and the small clams it left behind on the flat quickly dug their way back into the soil. In these latter respects the rake was so much superior to the clam hack that we decided to try to improve and adapt it to our fishing conditions.

THE NEW DIGGER

Design of New Digger

The development work was done at the Fisheries Research Board's Biological Station, St. Andrews, N.B., with assistance in designing it from H.Y. Brownrigg and his staff. The present digger

will bury themselves before the tide falls low enough to expose them for picking. For underwater collecting we built a rake with a head 24-inches-wide and crescent-shaped to fit the contours of the digger track. The head is covered with $\frac{1}{4}$ -inch mesh wire screening to form a collecting pocket. By working carefully, a raker can gather 95 per cent of the marketable clams brought up by the digger.

Collection raking is a time-consuming chore. Ten minutes of hydraulic digging generally brings up enough clams to keep a man busy at collection raking for one hour.

COMMERCIAL FISHING TRIALS

In 1962, commercial fishing trials with the new digger were carried out in St. Mary's River, Nova Scotia, and Kouchibouguac Gully, New Brunswick.

In St. Mary's River the flats are exposed at spring tides and can be dug with a clam hack. Marketable clams were present in an average density of 1 per square foot and we harvested them with the hydraulic digger at a rate of $\frac{1}{2}$ bushel per man-hour of effort. This is about as fast as a clam-hack fisherman would gather them from the same flat but we fished with a great deal less physical effort and with practically no breakage.

At Kouchibouguac the productive flats rarely dry off and clams are normally fished with rubber force cups (plumbers' helpers) or with the bare hands. Marketable clams were found in densities of about 5 per square foot and we harvested them at a rate of $1\frac{1}{2}$ bushels per man-hour of work. This is approximately three times the rate that a man can fish by present methods of harvesting submerged clam beds.



The new hydraulic digger showing the flat sprays from its tapered nozzles when the pump is delivering 130 gallons of water a minute at 25 pounds pressure.



Fisherman in waders using the crescent-shaped metal rake designed to fit the contours of the digger track and gather clams before they dig back into the soil. Clams are collected in a wire basket supported by an automobile inner tube.

HYDRAULIC DIGGING AND THE FUTURE OF THE CLAM FISHERY

Our experiments show that in sandy soils the new digger harvests (digging and raking) about 6 square feet per minute; recovers 95 per cent of the clams in its path; damages less than 5 per cent of the harvested clams and destroys 5 per cent or less of the small clams left behind in the soil. In contrast, a clam hack covers about 5 square feet per minute; recovers 60 per cent of the marketable clams in the soils; breaks 15 per cent of the harvested clams and smothers or otherwise destroys 50 per cent of the small clams left behind.

In other words, the hydraulic digger is a manoeuvrable and efficient tool for harvesting soft-shell clams. It eliminates drudgery, increases fishermen's work capacity and has conservation characteristics that strongly recommend its use in preference to the conventional clam hack.

Since hydraulic digging occupies only one-sixth of the total harvesting time, one person operating the digger could keep several people busy collection raking. From this we might expect that hydraulic digging would encourage teamwork among clam fishermen. This would exploit the full fishing capacity of the machine. The family group is the simplest team to form and we think that family enterprises might develop from its use.

The greatest problem facing the clam industry today is the general scarcity of clams. However, small beds continue to come and go in most clam areas. Some are fished and some are not. Fishing with hydraulic diggers, instead of clam hacks and other manual methods, could ensure fuller use of these stocks, and should increase the annual per-acre yield from our clam flats. ✓

International North Pacific Fisheries Commission

CONSERVATION recommendations for the halibut of the eastern Bering Sea were made at two recent meetings of the International North Pacific Fisheries Commission.

At its 9th Annual Meeting in Seattle last November, the Commission determined that the halibut stock of the eastern Bering Sea no longer meets the conditions of Article IV of the International Convention for the High Seas Fisheries of the North Pacific Ocean, and recommended to the contracting parties (United States, Canada, Japan), that this stock of halibut be removed from the list of stocks under abstention as described in the Annex to the Convention. (See Trade News, January, 1963.)

At the Seattle meeting, also, the Commission decided to hold an interim meeting in Tokyo in February, 1963, for the purpose of developing recommendations for conservation measures for halibut to be applied to the fisheries of the eastern Bering Sea at such time as the contracting parties approve the Commission's recommendation that halibut of the eastern Bering Sea be removed from abstention.

At the interim meeting each national section of the Commission expressed fully its views on necessary and appropriate conservation measures for the stock and area in question. In view of the results of research now available and taking into consideration the fact that the United States and Canada have long taken measures for the conservation of halibut in the eastern Bering Sea on the recommendation of the International Pacific Halibut Commission, the International North Pacific Fisheries Commission respectfully recommended to the governments of the Contracting Parties the following measures for the conservation of halibut in the eastern Bering Sea. These measures will be required for the purpose of halibut conservation at such time as all the Contracting Parties accept the Commission's recommendation that halibut of the eastern Bering Sea be removed from the Annex to the International Convention for the High Seas Fisheries of the North Pacific Ocean:

1. That the area within which these joint conservation measures shall apply is that portion of the Bering Sea lying east of the meridian of 175 degrees west longitude.

2. That the period within which these measures shall apply is from 0000 hours on March 25, 1963, to 2400 hours on March 24, 1964. All times mentioned shall be local standard time.
3. That no halibut of length less than 66 centimeters (26 inches), as measured from the tip of the lower jaw to the extreme end of the middle of the tail, or halibut which, with the head off and entrails removed, are less than 2.25 kg. (5 lbs.) in weight may be retained at any time by any fishing vessel of any of the Contracting Parties.
4. That nothing within any of these recommendations shall apply to or restrict the operations of a bona-fide research vessel under the direct control of a Contracting Party.
5. That within the joint conservation area the opening date for the retention of halibut by any fishing vessel of any of the Contracting Parties shall be 1800 hours, March 25, 1963.
6. Outside the triangular area as defined in item 7, fishing vessels of any Contracting Party shall not retain any halibut captured after 1800 hours on October 15, 1963, except as stated in item 8 below.
7. That within the triangular area bounded by a line connecting Cape Navarin and the northern tip of Cape Sarichef, Unimak Island; the meridian of 170°W. longitude; and the Aleutian Islands: (a) the catch quota for halibut for the 1963 season shall be 11,000,000 pounds or 5,000 metric tons to be computed with heads off and entrails removed, (b) fishing vessels of any Contracting Party shall not retain any halibut captured after 1800 hours on the date the catch quota has been reached or after 1800 hours on October 15, 1963, whichever is earlier.
8. That, outside of the triangular area defined in item 7 above, linefishing vessels may retain incidentally-caught halibut at a ratio of one pound of halibut for each seven pounds of other species until 1800 hours, November 15, 1963.
9. All vessels employing any type of net trawl gear shall return to the sea immediately any

halibut taken within an area bounded by the meridian of 175 degrees west longitude; the Aleutian Islands and the Alaska Peninsula; a line from Cape Newenham to the intersection of a line from Cape Navarin to the northern tip of Cape Sarichef on Unimak Island with the meridian of 170 degrees west longitude, and a line from this point to the intersection of the meridian of 175 degrees west longitude with the line from Cape Navarin to the northern tip of Cape Sarichef on Unimak Island.

The Commission took note, in relation to the above recommendations for conservation measures in the eastern Bering Sea, that the Government of Japan, as a domestic measure in 1963, intends to prohibit trawling of all kinds in an area defined as follows:

An area delimited by the line of 160° west longitude; a line connecting the point of 58°10' north latitude, 160° west longitude, and the point of 57°10' north latitude, 163° west longitude; the line of 163° west longitude; a line running from the point of

56°20' north latitude, 163° west longitude, through the point of 56° north latitude, 164° west longitude, to its intersection with a line connecting Cape Navarin of the U.S.S.R. and the northern tip of Cape Sarichef, Unimak Island; a line connecting Cape Navarin and the northern tip of Cape Sarichef; the Aleutian Islands; and the Alaska Peninsula.

This action by Japan will, to a great extent, afford protection for the young juvenile halibut known to be concentrated in the region.

The Commission also noted that, in relation to the above recommendations, the Government of Japan intends to establish for 1963 a minimum size limit of 66 centimeters for retention of halibut throughout the Bering Sea.

Further, the Commission recorded that it is developing a research program to provide information which will extend and improve the scientific basis for the conservation of the groundfish of the Bering Sea. ✓

North Pacific Fur Seal Conference

RECOMMENDATIONS OF the North Pacific Fur Seal Commission on the methods of sealing best suited to achieve the objectives of the Convention, and other measures required to achieve maximum sustainable productivity of the North Pacific fur seal herds, were considered at a conference held in Tokyo in February, attended by representatives of the four countries concerned, Canada, U.S.A., U.S.S.R., and Japan. These countries are party to the interim Convention on Conservation of North Pacific Fur Seals of 1957.

The Conference adopted a report to the governments of the Contracting Parties recommending that they amend the present Interim Convention by concluding a Protocol to the Convention. If all the four governments, after reviewing a draft of the protocol, agree to its content, it will be opened for signature by the four governments in Washington, D.C. The protocol is to enter into force October 16, 1963, or on the date thereafter when ratification by the four governments is completed.

The Conference decided to record the understanding of the representatives of the respective governments that it is the intent of the Convention that the North Pacific Fur Seal Commission may make recommendations concerning the conservation of fur seals prior to having determined the relationship between fur seals and other living marine resources, it being understood that when the Commission makes such recommendations, it will take

into account all pertinent scientific information available at the time.

The suggested protocol would provide for the continued marking of adequate numbers of pups on the rookeries, and for continuation of pelagic research to an extent similar to that of recent years, provided that this shall not involve the taking of more than 2500 seals in the eastern Pacific and more than 2200 in the western Pacific, unless the Commission decides otherwise.

The number of seals to be marked on the rookery islands from time to time, as well as the numbers to be taken at sea for research purposes, the times at which such seals shall be taken and the numbers to be taken by each party to the Convention would also be determined by the Commission.

Also under the protocol, the Commission would study whether or not pelagic sealing in conjunction with land sealing could be permitted in certain circumstances without adversely affecting achievement of the objectives of the Convention, and would make recommendations thereon to the contracting parties at specified dates in the future.

The report transmitting the draft protocol to the four governments was signed in Tokyo on March 1 by the following representatives of the contracting parties: Canada, W.M. Sprules; Japan, Yoshimitsu Ando; U.S.S.R., A.S. Babaev; U.S.A., W.C. Herrington. ✓

Dr. A.W.H. Needler New Deputy Minister

DR. A. W. H. NEEDLER, O.B.E., Ph.D., F.R.S.C., of Nanaimo, B.C., has been appointed Deputy Minister of Fisheries of Canada to succeed the late George R. Clark, who died suddenly in Tokyo on February 12. One of the world's most respected fishery scientists, Dr. Needler for more than 35 years has studied the fishery resources of both the Atlantic and Pacific Oceans upon which the major part of Canada's fishing industry depends. This appointment was announced by Prime Minister John G. Diefenbaker.

Director of the Fisheries Research Board of Canada's Biological Station at Nanaimo, B.C., since 1954, Dr. Needler was also Director of the Board's Biological Station at St. Andrews, N.B., from 1941 until his transfer to the Pacific coast. For a period (1948-1950) he acted in the dual capacity of Assistant Deputy Minister of the Department and Director of the Board's St. Andrews Station.

In January of this year, Dr. Needler was appointed chairman of the recently-established FAO Advisory Committee on Marine Resources Research, which held its first meeting at FAO's headquarters in Rome from January 28 to February 2.

Born at Huntsville, Ontario, in August 1906, he is the son of George Henry Needler, former Professor of German at the University of Toronto. He is married and has six children. He attended University of Toronto Schools, and received his Bachelor of Arts (1926), Master of Arts (1927) and Doctor of Philosophy (1930) from the University of Toronto. He was awarded an Honorary Doctor of Science degree from the University of New Brunswick.

Dr. Needler first became associated with the Research Board in 1924 as a volunteer investigator and continued on as a full-time biologist in charge of Atlantic oyster investigations at the Biological Sub-station at Eglerslie, P.E.I. In 1929 and 1930, Dr. Needler was Scientific Assistant in Zoology, and Assistant Zoologist from 1931 to 1937. He was Associate Zoologist from 1937 to 1939, and Chief Zoologist from 1939 to 1941, when he became Director of the then Atlantic Biological Station, St. Andrews, N.B., of the Fisheries Research Board of Canada.

He was a member of the Committee on Fisheries Statistics, North American Council on Fisheries Investigations, 1928, and was Adviser to the International Passamaquoddy Fisheries Commission from 1931 to 1934. He was Secretary to the Fisheries Committee at the first FAO Conference in Quebec in 1945, and a member of the Canadian delegation to the second FAO Conference at Copenhagen in 1946. He was also Scientific Alternate Chairman of the Atlantic Herring Investigation Committee.



Dr. Needler was one of the delegates who attended the Northwest Atlantic Fisheries Conference in Washington in 1949 to negotiate the International Convention for the Northwest Atlantic Fisheries. He was appointed the first chairman of the Committee on Research and Statistics of the International Commission for the Northwest Atlantic Fisheries which was set up under the convention.

Dr. Needler's work has covered many areas of fisheries research, such as oceanography; life history, migration and ecology of haddock; biological study of fisheries statistics; ecology of the oyster of Canadian Atlantic waters; oyster culture and general fisheries biology. The development of the Irish moss industries and oyster culture methods in the Maritime Provinces are a direct result of Dr. Needler's work.

As head of the Fisheries Biological Station at Nanaimo, B.C., Dr. Needler has been responsible for directing research into salmon, groundfish, herring and other commercially important fish stocks of the Pacific Ocean. The work of his station has been closely identified with Canada's fisheries research commitments as a member of seven international fishery commissions, five of which are directly concerned with fish, crustaceans and mammals of the Pacific Ocean.

Dr. Needler is a member of the Skeena River Committee which was set up to advise on management of the Skeena River fisheries designed to develop and expand salmon resources of the area, and a member of the Departmental committee on

(Continued on page 10)

Canadian Fisheries News

Eel Fishing in Nfld.

A new venture in the fishing industry of Newfoundland is the shipment of live eels to European markets.

Recently, the Dutch Motor Vessel "Mercurius" loaded some 35,000 pounds of live eels at Grand Bank and Dildo. Already on board were 90,000 pounds of the species, taken on at fishing centres in the Maritime Provinces.

The 300-ton "Mercurius", a formal naval landing craft, has her hold space converted into a large tank in which the live eels are carried. Salt water is kept in continuous circulation in the tank-hold in order to keep the eels alive until they reach their destination.

The "Mercurius" ordinarily operates in European waters. Never before has a ship of this type been seen in Newfoundland waters:

Eels are considered a delicacy in some European countries, and in order to meet market demands this year the owners of the "Mercurius" decided to explore the supply available in Canada's Atlantic provinces. This first shipment is for discharge in the Netherlands.

While new to Newfoundland, eel fishing has been part of the fisheries of the Maritimes, Ontario and Quebec for quite some time. Quebec has been the big producer, responsible for 90 per cent of the Canadian catch. The yield comes principally from the St. Lawrence and its tributaries. The United States and Germany have been the main markets, the eels being shipped live to the U.S. and in a frozen state to Germany.

As recorded in history, eels have long been considered an epicurean delight. In Macedon, more than 2000 years ago, elvers were transported and held in ponds as a prized food delicacy. Even the Roman emperors served eels at their famous banquets.

Unlike other creatures of the sea, eels cannot be taken in immense quantities, and mass production is not possible. As far as is known, all eels originate in the same birth place--the Sargasso Sea, between Bermuda and the West Indies. The eggs are laid near the bottom of the sea, and like the salmon, the male and female die shortly after spawning. In their migration the young eels enter freshwater rivers from the Gulf of Mexico to Greenland, the males remaining in the brackish waters of estuaries, while the females continue upstream,

even to the very headwaters. Their stay in fresh waters covers a period of seven years or more.

Since they travel principally in darkness, catches are made generally at night, the fishermen using a baited trap or pot. Fishing is best during the autumn, from the end of August to the end of November.

Over a decade ago an experiment in shipping young eels by air from the Maritimes for planting in Saskatchewan rivers was undertaken by the Fisheries Research Board of Canada. The eels were shipped in sealed wax paper bottles. While this was the first time that elvers were transported by air over a long distance (2000 miles), the transfer of live eels from coastal areas to inland areas is not new. At the turn of the century, elvers were transported in tanks from England to Germany for planting in Hamburg rivers, and in Ireland they are moved by lorry from river mouth to headwaters.

The experimental eel fishery in Newfoundland is being watched with interest by many who are convinced that the venture holds promise of a lucrative, though small-scale enterprise.

New Guise for Freshwater Fish

Whitefish and pike are two of our most popular freshwater fish. The flesh of the whitefish is soft, gelatinous and noted for its delicate flavour. The flesh of the pike is firm, lean, and it too has fine flavour. Alone or in combination, both fish are delicious.

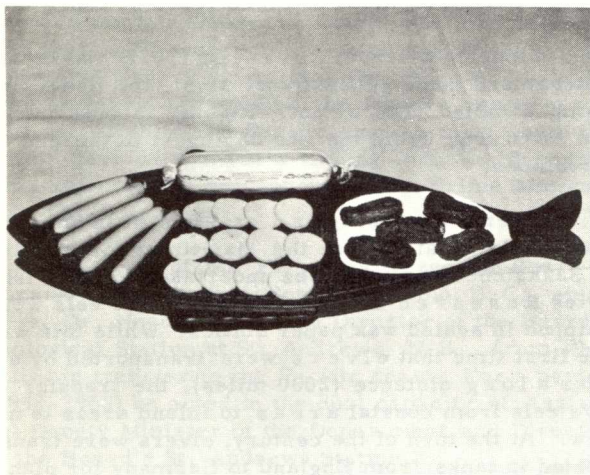
Up to the present, whitefish and pike have been principally marketed as whole, dressed fish, and as fish fillets. Now, among new fish products being offered to Canadian consumers are three which combine both species. These products give the fish both a new look and a new taste. They are fishfurters, fish loaf, and fish croquettes. All are being marketed in the frozen form.

The fishfurters, as their name indicates, are fish sausages. Although they resemble frankfurters in size and shape, they are not smoked. Their flavour is delicate and distinctive from that of meat sausages.

Somewhat similar in idea but different in flavour is a rounded fish loaf shaped like a small bologna roll. Sliced and served hot or cold, it provides a new mild flavour for the palate of Canadians.

Perhaps the most unique of these new products is fish croquettes. Oblong in shape and a deep,

rich brown colour, the croquettes are eye appealing. Inside they are firm, smooth and white. As they have been cooked in vegetable oil, folk whose diets restrict animal fats can enjoy them.



The plant in which the fishfurters and croquettes are processed operates under federal government supervision and cartons containing these products may show the maple leaf insignia of the Department of Fisheries of Canada.

Arctic Char

Providing a way can be found to spread small fishing operations over a large area of the north, there seems to be a promising future for arctic char, the northern fish which is rapidly becoming a favourite item on hotel and restaurant menus in both Canada and the United States. It is also gaining popularity as a sports fish, and anglers who like to travel far and explore new territory, as well as Eskimos who have found it a new source of livelihood, can take comfort in the fact that the species is widely distributed.

Scientists of the Fisheries Research Board of Canada have found arctic char practically everywhere in the Arctic Archipelago. Last summer they made an extensive survey, mainly on fishes and biological oceanography, and on marine mammals where possible, in the Canadian arctic islands.

A co-ordinating base was established at Cambridge Bay on Victoria Island, N. W. T., and four stationary camps were established at Eureka on Ellesmere Island, Assistance Bay on Cornwallis Island, Cresswell Bay on Somerset Island; and at the mouth of the Thomsen River on Banks Island. From these camps visits were made to Axel Heiberg Island, Grinnel Peninsula on Devon Island, Prince of Wales Strait, and lakes on several of the larger islands.

In addition to both landlocked and anadromous arctic char, the scientists found lake herring, lake trout, and whitefish farther north than had been considered the normal range of these species.

Scallop Regulations

The Department of Fisheries of Canada has announced that processed scallops in Canada are now subject to compulsory inspection. This latest move takes in frozen scallops and those processed in the breaded, cooked state. Fresh scallops have been subject to compulsory inspection since 1961.

The scallop fishery of the Maritime Provinces has experienced a phenomenal growth in recent years. In order to ensure that only a top quality product will reach the consumer, the Department has established standards for freshness, processing facilities and packaging. In 1960, the bulk of the scallop production was marketed in the fresh state only, but since then there has been a considerable growth in the production of frozen and breaded cooked scallops.

The new regulations also establish the maximum amount of breading and batter that can be used on scallop meat. This proportion is similar to that which was established for fish sticks several years ago.

The standards for plants processing scallops are identical to those for other plants which have qualified under Canadian Government Specifications Board requirements for certification. Scallops either in the fresh or frozen form which are of the highest quality -- those which are graded No. 1 -- may be stamped with the well-known "Canada Inspected" designation, the consumer's guarantee that rigid standards of production procedures have been observed.

NEW DEPUTY MINISTER . . .

(Continued from page 8)

British Columbia Herring Management. A member of the Pink Salmon Co-ordinating Committee established to investigate, co-ordinate and recommend action for the management of the Fraser River and contiguous pink salmon stocks of the Pacific Coast, Dr. Needler is in addition a member of the committee organized to study problems of mutual concern to the salmon fisheries of northern British Columbia and Southeast Alaska. He has also been a member of the Board of Management of the British Columbia Research Council.

In recognition of his work in fisheries during World War II Dr. Needler was made an officer, Order of the British Empire. He is also a Fellow of the Royal Society of Canada. ✓

Fishery Figures For January

SEAFISH: LANDED WEIGHT AND LANDED VALUE

	May 1961-January 1962		May 1962-January 1963	
	'000 lbs	\$'000	'000 lbs	\$'000
CANADA TOTAL	1,572,527	86,311	1,713,583	102,713
ATLANTIC COAST - Total	1,081,794	51,002	1,180,027	58,832
Cod	489,260	14,659	552,652	17,380
Haddock	55,113	2,212	60,732	2,807
Pollock, Hake & Cusk	68,548	1,482	78,628	2,102
Rosefish	54,437	1,429	59,099	1,542
Halibut	4,323	1,193	3,864	1,182
Plaice & Other Flatfish	102,154	3,166	89,946	2,811
Herring & Sardines	177,194	2,576	219,344	3,272
Mackerel	14,868	756	16,144	653
Swordfish	3,198	1,238	3,468	1,570
Salmon	3,490	1,451	3,827	1,603
Smelts	1,970	197	2,186	186
Alewives	7,528	142	10,323	168
Other Fish	17,798	398	15,720	464
Lobsters	45,301	16,575	44,214	18,662
Clams & Quahaugs	3,297	143	3,053	137
Scallops	9,052	2,622	11,642	3,897
Other Shellfish	24,263	763	5,185	396
PACIFIC COAST - Total	490,733	35,309	533,556	43,881
Pacific Cods	6,394	535	7,380	629
Halibut 1/	26,306	5,586	31,119	9,734
Soles & Other Flatfish	4,849	281	5,008	318
Herring	319,247	3,331	318,174	3,425
Salmon	117,706	24,660	154,620	28,748
Other Fish	6,180	175	6,274	205
Shellfish	10,051	741	10,971	822
BY PROVINCES				
British Columbia	490,733	35,309	533,556	43,881
Nova Scotia	370,000	22,381	347,221	26,137
New Brunswick	129,665	7,230	191,107	8,648
Prince Edward Island	36,404	4,167	37,480	4,355
Quebec	103,566	3,921	127,333	4,776
Newfoundland	442,159	13,303	476,886	14,916

(1) Includes halibut landed in U.S. ports by Canadian fishermen.

MID-MONTH WHOLESALE PRICES, Jan. 1963				PRICES PER CWT. PAID TO FISHERMEN (Week ending January 19th)		
		Montreal Toronto		1962		1963
		\$	\$	\$	\$	\$
Cod fillets, Atl. fresh, unwrapped	lb	.327	.387	Halifax		
Cod fillets, Atl. frozen, cello 5's	lb	.293	.333	Cod Steak	5.00	5.00
Cod fillets, smoked	lb	.360	.430	Market Cod	4.50	4.50
Haddock fillets, fresh, unwrapped	lb	.425	.490	Haddock	7.00	7.00
Herring kippered, Atl.	lb	.254	.300	Plaice	4.00	4.00
Mackerel, frozen, round	lb	.220	.267	<u>Yarmouth</u>		
Lobsters, canned, Fancy case 48- $\frac{1}{2}$ s		46.320	44.573	Haddock	-	-
Sardines, canned case 100- $\frac{1}{4}$ s		9.490	9.635	<u>Black's Harbour</u>		
Halibut, frozen dressed	lb	.487	.533	Sardines	2.00	-
Silverbright, frozen, dressed	lb	.552	.567	<u>St. John's, Nfld.</u>		
Coho, frozen, dressed	lb	.705	.713	Cod	2.75	3.00
Sockeye, canned, Gr. A case 48- $\frac{1}{2}$ s		26.737	27.620	Haddock	2.25	2.25
Pink, canned, Gr. A case 48- $\frac{1}{2}$ s		14.620	15.074	Rosefish	2.00	2.00
Whitefish, fresh	lb	.417	.433	<u>Vancouver</u>		
Lake Trout, frozen	lb	.451	.450	Ling Cod	17.00	16.00
				Grey Cod	6.00-7.00	7.00
				Soles	9.00	9.00
				Salmon (Rdspg)	-	-

Fishery Figures For January

STOCKS AS AT END OF JANUARY

	1962	1963
	'000 lbs	'000 lbs
<u>TOTAL - Frozen Fish, Canada</u>	<u>52,919</u>	<u>52,942</u>
<u>Frozen-Fresh, Sea Fish - Total</u>	<u>28,430</u>	<u>34,028</u>
Cod Atlantic, fillets & blocks	5,694	6,529
Haddock, fillets & blocks	2,790	1,906
Rosefish, fillets & blocks	1,221	1,495
Flatfish (excl. Halibut), fillets & blocks	3,472	2,084
Halibut Pacific, dressed & steaks	3,941	7,250
Other Groundfish, dressed & steaks	821	732
Other Groundfish, fillets & blocks	1,509	2,261
Salmon Pacific, dressed & steaks	3,526	4,762
Herring Atlantic & Pacific	1,040	888
All Other Sea Fish, all forms	2,836	4,264
Shellfish	1,580	1,857
<u>Frozen-Fresh, Inland Fish - Total</u>	<u>8,900</u>	<u>5,720</u>
Perch, round or dressed	438	168
Pickerel (Yellow & Blue) fillets	621	627
Sauger, round or dressed	517	-
Tullibee, round or dressed	216	95
Whitefish, round or dressed	1,030	906
Whitefish, fillets	1,481	160
Other, all forms	4,597	3,764
<u>Frozen-Smoked Fish - Total</u>	<u>1,519</u>	<u>1,372</u>
Cod Atlantic	713	608
Sea Herring, kippers	418	459
Other, all forms	325	305
<u>Frozen for Bait and Animal Feed</u>	<u>14,070</u>	<u>11,822</u>
<u>Salted and Pickled Fish, Atl. Coast</u>		
<u>Wet-salted - Total</u>	<u>14,571</u>	<u>18,639</u>
Cod	13,013	16,435
Other	1,558	2,204
<u>Dried - Total</u>	<u>17,376</u>	<u>21,725</u>
Cod	16,595	19,275
Other	781	2,450
<u>Boneless - Total</u>	<u>672</u>	<u>728</u>
Cod	591	642
Other	81	86
<u>Pickled - Total</u>	<u>20,693</u>	<u>26,576</u>
Herring	15,776	13,448
Mackerel	1,769	6,451
Alewives	2,742	6,575
Turbot	406	402
<u>Bloaters (18 lb. boxes)</u>	<u>32,734</u>	<u>115,258</u>
<u>Boneless Herring (10 lb. boxes)</u>	<u>60</u>	<u>4,107</u>

CANADIAN EXPORT VALUE OF FISHERY PRODUCTS MAY-DECEMBER

(Value in Thousands of Dollars)

	1961	1962
<u>Total Exports</u>	<u>107,006</u>	<u>115,889</u>
<u>By Markets:</u>		
United States	77,589	84,197
Caribbean Area	10,703	11,392
Europe	16,942	17,865
Other Countries	1,772	2,435
<u>By Forms:</u>		
<u>Fresh and Frozen</u>	<u>70,902</u>	<u>77,117</u>
<u>Whole or Dressed</u>	<u>26,180</u>	<u>28,201</u>
Salmon, Pacific	6,085	7,087
Halibut, Pacific	4,245	4,781
Cod, Haddock, Pollock, etc.	360	284
Swordfish	1,683	2,037
Other Seafish	3,121	3,844
Whitefish	4,207	3,842
Pickerel	2,241	2,145
Other Freshwater fish n.o.p.	4,238	4,181
<u>Fillets</u>	<u>27,151</u>	<u>29,794</u>
Cod, Atlantic	10,856	12,150
Haddock	2,726	2,610
Rosefish, Hake, Pollock, etc.	2,745	3,192
Flatfish	4,578	5,064
Pickerel	1,321	1,637
Other	4,925	5,141
<u>Shellfish</u>	<u>17,571</u>	<u>19,122</u>
Lobster (Alive & Meat)	14,609	15,123
Other	2,962	3,999
<u>Cured</u>	<u>14,135</u>	<u>14,803</u>
<u>Smoked</u>	<u>883</u>	<u>981</u>
Herring	566	677
Other	317	304
<u>Salted, Wet & Dried</u>	<u>11,579</u>	<u>12,250</u>
Cod	9,939	10,244
Other	1,640	2,006
<u>Pickled</u>	<u>1,673</u>	<u>1,572</u>
Herring	1,094	999
Mackerel	149	194
Other	430	379
<u>Canned</u>	<u>15,564</u>	<u>16,511</u>
Salmon	10,900	11,454
Sardines	2,072	2,218
Lobster	1,691	2,115
Other	901	724
<u>Miscellaneous</u>	<u>6,405</u>	<u>7,458</u>
Meal	3,503	4,230
Oil	490	382
Other	2,412	2,846

Fisheries News From Abroad

New Research Submarine

The United States Department of the Interior's first submarine, a 2-man, 12-foot research vessel, is now operating in San Francisco Bay.

The torpedo-shaped craft, destined for a major role in undersea studies by the Service's Bureau of Sport Fisheries and Wildlife, is a "dry" submarine. This means that the occupants--one operator and one passenger--are enclosed and protected from the sea.

A major problem in marine game fish research by the Bureau has been the inability of scientists to enter the undersea environment safely and to make direct observations. By using the new battery-powered submarine, research biologists now will be able to accompany electronic and photographic equipment under water to record and observe marine creatures for extended periods.

Capable of operating to depths of 300 feet, the 2,000-pound underwater craft offers each occupant 360° viewing, and can cruise submerged for 10 hours at speeds ranging from two to six knots.

The submarine will be used for observing schooling and feeding behavior of fish, surveys of bottom conditions, locating concentrations of fish, and studies of shark behavior.

There are two conning towers on the submarine, one for each occupant. The front tower is canted forward and down to increase visibility directly ahead of the craft and of the sea bottom. The submarine is controlled by an airplane-type stick to give rapid response of hydroplanes and rudder at all speeds. Ballast tank controls and trim tanks permit the submarine to operate at positive, neutral, and negative buoyancy. It has two forward and two reverse speeds. An air filter system removes carbon dioxide, permitting the occupants to breathe clean air.

U.S.S.R. Fisheries

The Soviet Union in 1961 both imported and exported less fish and fish products than during 1960, according to figures published by the Food and Agriculture Organization of the United Nations.

The FAO statistics show Soviet fisheries exports for 1961 - the latest year for which world figures are available - at 79,600 tons valued at \$42,091,000. In 1960 the Soviet Union exported 104,800 tons worth \$43,066,000.

Soviet imports meanwhile were down by almost half - from 109,000 tons valued at \$24,769,000 in 1960 to only 56,300 tons worth \$15,260,000 in 1961.

By far the Soviet Union's biggest money earner among her fishery exports was canned fish and similar products. She exported some 22,000 tons worth about \$22 million, the most of it going to countries of Eastern Europe.

The Soviets also exported 31,300 tons of dried, salted or smoked fish worth \$5,928,000; 3,700 tons of crustacean and mollusc products worth \$9,435,000; 17,400 tons of oils and fats of aquatic origin worth \$4,101,000; and 4,900 tons of fish meal for animal feeding worth \$623,000.

Top Import Items

Top items among Soviet imports were 28,900 tons of oils and fats worth \$7,415,000; and 18,700 tons of fresh, frozen or chilled fish worth \$5,117,000.

The rest of the Soviet fishery imports were made up of 8,600 tons of dried, smoked or salted fish worth \$1,922,000 and 100 tons of caviar worth \$806,000. The caviar came from Iran.

With a national catch of 3.2 million tons in 1961, the Soviet Union ranked fourth among the world's fishing powers. Only Japan with 6.7 million tons, Peru with 5.2 million, and Mainland China with five million tons (FAO estimate), caught more.

Following the Soviet Union the remaining top ten fishing nations were the United States, 2,874,000 tons; Norway, 1,509,000 tons; Canada, 1,020,000; Spain, 1,014,000; South Africa and South West Africa, 1,010,000; and India, 961,000 tons.

The Soviet statistics, though the U.S.S.R. is not a member of the Organization, were made available to FAO by the Soviet authorities.

San Pedro, California, now ranks as the largest fishing port in the United States. Its landings last year, mainly tuna and pilchards, amounted to 363 million pounds valued at \$36 million.

New Bedford was in second place with a landed value of \$17 million but this was an all-time record for a New England port. Brownsville, Texas, was in third place, followed by Boston, San Diego and Gloucester. In volume of catch, however, all the above ports except San Pedro were outclassed by some of those engaged in industrial fishing.

Iceland

EXPORTS OF PRINCIPAL FISHERY PRODUCTS

January - September 1962

Quantities in Thousands of Pounds

Value in Thousands of Kroner

DESTINATION	TOTAL EXPORTS		MAINLY COD						HERRING		FISH MEAL	OILS		OTHER PROD. (1)
	Quan.	Value	Fresh	Frozen	Dry Salted	Wet Salted	Stock fish	Other Types	Frozen	Salted		Cod	Other	
	th. lb.	th. kr.	th. lb.	th. lb.	th. lb.	th. lb.	th. lb.	th. l. b.	th. lb.	th. lb.		th. lb.	th. lb.	
Canada	4,878	9,642	-	-	-	-	-	-	-	-	-	-	4,878	-
U.S. A.	48,158	376,559	-	37,899	-	11	-	780	53	1,049	595	1,135	-	6,636
<u>Other Western Hemisphere</u>														
Argentina	11	44	-	-	-	-	-	-	-	-	-	11	-	-
Barbados	5	16	-	-	-	-	-	-	-	-	-	5	-	-
Brazil	3,346	29,942	-	-	3,075	-	-	-	-	-	-	271	-	-
Costa Rica	9	36	-	-	-	-	-	-	-	-	-	9	-	-
Honduras	22	97	-	-	-	-	-	-	-	-	-	22	-	-
Jamaica	2	7	-	-	-	-	-	-	-	-	-	2	-	-
Mexico	44	178	-	-	-	-	-	-	-	-	-	44	-	-
Panama	417	3,474	-	-	417	-	-	-	-	-	-	-	-	-
Peru	2	8	-	-	-	-	-	-	-	-	-	2	-	-
Trinidad	4	39	-	-	4	-	-	-	-	-	-	-	-	-
Venezuela	181	1,713	-	-	174	-	-	-	-	-	-	7	-	-
<u>Europe</u>														
Belgium	24	130	-	-	13	-	-	-	-	-	-	9	-	2
Bulgaria	132	487	-	-	-	-	-	-	-	-	-	132	-	-
Czechoslovakia	15,263	68,376	-	3,102	-	-	-	-	4,848	-	4,725	2,315	-	273
Denmark	26,690	80,510	0	0	-	712	5	37	-	529	22,445	990	1,118	854
Faroe Islands	1,299	3,242	-	-	-	-	0	-	1,299	-	-	-	-	-
Finland	18,695	73,520	-	-	-	-	-	-	-	10,864	4,478	452	-	2,901
France	4,854	28,885	-	2,721	-	-	-	2	-	-	-	-	-	2,131
Germany East	10,829	32,083	-	-	-	-	-	-	8,221	2,608	-	-	-	-
Germany West	81,734	210,422	16,695	-	-	807	132	1,568	4,475	1,905	35,623	101	5,851	14,577
Greece	6,700	34,745	-	-	29	3,497	4	-	-	-	-	9	-	3,161
Hungary	4	348	-	-	-	-	-	-	-	-	-	-	-	4
Ireland	2,590	7,529	-	-	-	-	-	-	-	-	2,590	-	-	-
Italy	19,764	118,237	-	-	9	16,590	948	2,176	-	-	-	-	27	14
Netherlands	4,507	27,689	-	1,931	225	-	-	-	2	-	1,047	364	891	47
Norway	50,394	88,919	-	-	-	-	-	4	77	-	-	844	39,850	9,619
Poland	11,630	38,999	-	-	-	-	-	-	2,284	4,409	4,606	331	-	-
Portugal	11,836	63,168	-	-	-	11,836	-	-	-	-	-	-	-	-
Roumania	4,407	11,997	-	-	-	-	-	-	3,305	1,102	-	-	-	-
Spain	13,948	80,363	-	-	172	13,298	-	-	-	-	-	-	-	478
Sweden	39,231	133,753	0	-	-	-	-	7	0	14,522	6,866	441	9,083	8,312
Switzerland	368	2,448	-	-	-	-	-	-	-	11	-	-	-	357
United Kingdom	107,320	425,473	21,061	10,265	123	5,919	6,299	-	421	-	42,471	200	11,764	8,797
U. S. S. R.	63,918	335,325	-	32,961	-	-	-	-	11,023	19,835	-	-	-	99
Yugoslavia	309	1,049	-	-	-	-	-	-	-	-	-	309	-	-
<u>Other Countries</u>														
Australia	92	595	-	15	-	-	-	-	-	-	-	22	-	55
Bolivia	5	19	-	-	-	-	-	-	-	-	-	5	-	-
Burma	9	36	-	-	-	-	-	-	-	-	-	9	-	-
Ceylon	4	12	-	-	-	-	-	-	-	-	-	4	-	-
China	5	17	-	-	-	-	-	-	-	-	-	5	-	-
Egypt	141	628	-	-	-	-	-	-	-	-	-	141	-	-
Ghana	7	23	-	-	-	-	-	-	-	-	-	7	-	-
Hong Kong	9	34	-	-	-	-	-	-	-	-	-	9	-	-
Israel	4	11	-	-	-	-	-	-	-	-	4	-	-	-
Jordan	22	250	-	-	22	-	-	-	-	-	-	-	-	-
Lebanon	9	104	-	-	9	-	-	-	-	-	-	-	-	-
Nigeria	7,057	79,819	-	-	-	-	7,057	-	-	-	-	-	-	-
Pakistan	11	145	-	-	-	-	-	-	-	-	-	11	-	-
Singapore	4	11	-	-	-	-	-	-	-	-	-	4	-	-
South Africa	6	24	-	-	-	-	-	-	-	-	-	6	-	-
Turkey	17	80	-	-	-	-	-	-	-	-	-	17	-	-
Total Jan.-Sept. 62	560,927	2,371,260	37,756	88,894	4,272	52,670	14,445	4,570	35,935	56,911	125,450	8,272	73,435	58,317
Total Jan.-Sept. 61	459,946	1,752,978	45,329	90,781	6,764	53,327	15,778	4,930	30,500	42,476	120,801	7,388	27,300	14,572

0 Less than half the unit used

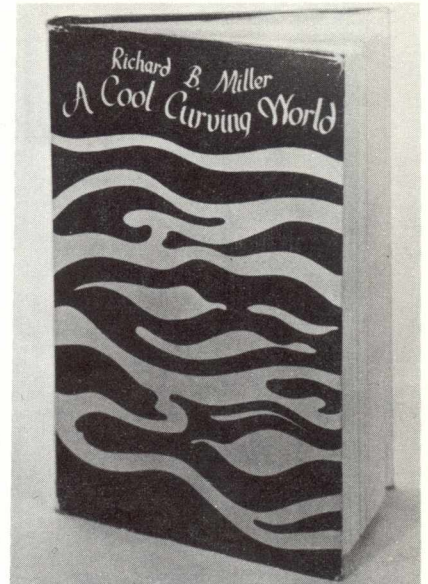
(1) Includes all whale products which totalled in Jan. -Sept. 1962, 6,999 thousand pounds and in the first six months of 1961, 7,712,000 pounds.

Current Reading

"A COOL CURVING WORLD" by R. B. Miller, (Published October 19, 1962 by Longmans Canada Ltd., 220 pages, six photos \$5.25).

One of the most important contributions to be expected from this book is the encouragement offered to research scientists in the new world to attempt to bridge the gulf between their scientific treatises and interpretative writing. Too few have attempted this task which has been so well done by the late Dr. Miller in an interesting and informative yet whimsical, humorous manner. The rather disjointed gathering of reminiscences (obviously purposeful) should attract readers who, from each sally, will be able to fill in other characteristics of the author and his close colleagues.

One cannot ignore the interpretation of biological principles in the fields of the author's particular endeavours. These run throughout the book and are slanted towards their possible effect on the fisheries and fishermen. Not only do they give a clear indication of the author's own feelings on progress, life and human values but they do it in such a way as to avoid the accusation of sermonizing. One cannot help but feel that this is a cleverly concealed autobiography of a portion of the author's life -- concealed because of his innate modesty. He makes his points cleverly to the accompaniment of "sugar-coated pills" to aid in digestion. It is too bad that Dr. Miller has not been spared to do an equally good job on his other interests which were many and varied.



To those who knew Dr. Miller throughout his career, the book can be no surprise. With due modesty he found a way to indicate his fervent attachment to outdoor life, fostered and encouraged from his youth. His intensity and keen ability to assess situations and clearly resolve problems is obvious. That he always had the gift of being able to express himself is accentuated by his descriptions such as that for the "fathead minnow" - "like goldfish with black socks over their heads". He displays, in addition, his great saving characteristics of being able to laugh at his difficulties and problems.

Although to some he may appear to overemphasize the importance of his contribution, his work was important and will only be judged in true perspective by history. The surveys which he described were sound and basic to development. His analysis of the tapeworm life history, its effects and possible control were realistic. His ideas on propagation were new and even disturbing at the time. He could have exhibited much more personal satisfaction in his accomplishments without boasting yet he chose to conceal any such attitude with humour and simple expositions on the animals he encountered.

This is a book well worth reading if one is interested enough to look for the many implications and messages. -- A. L. PRITCHARD

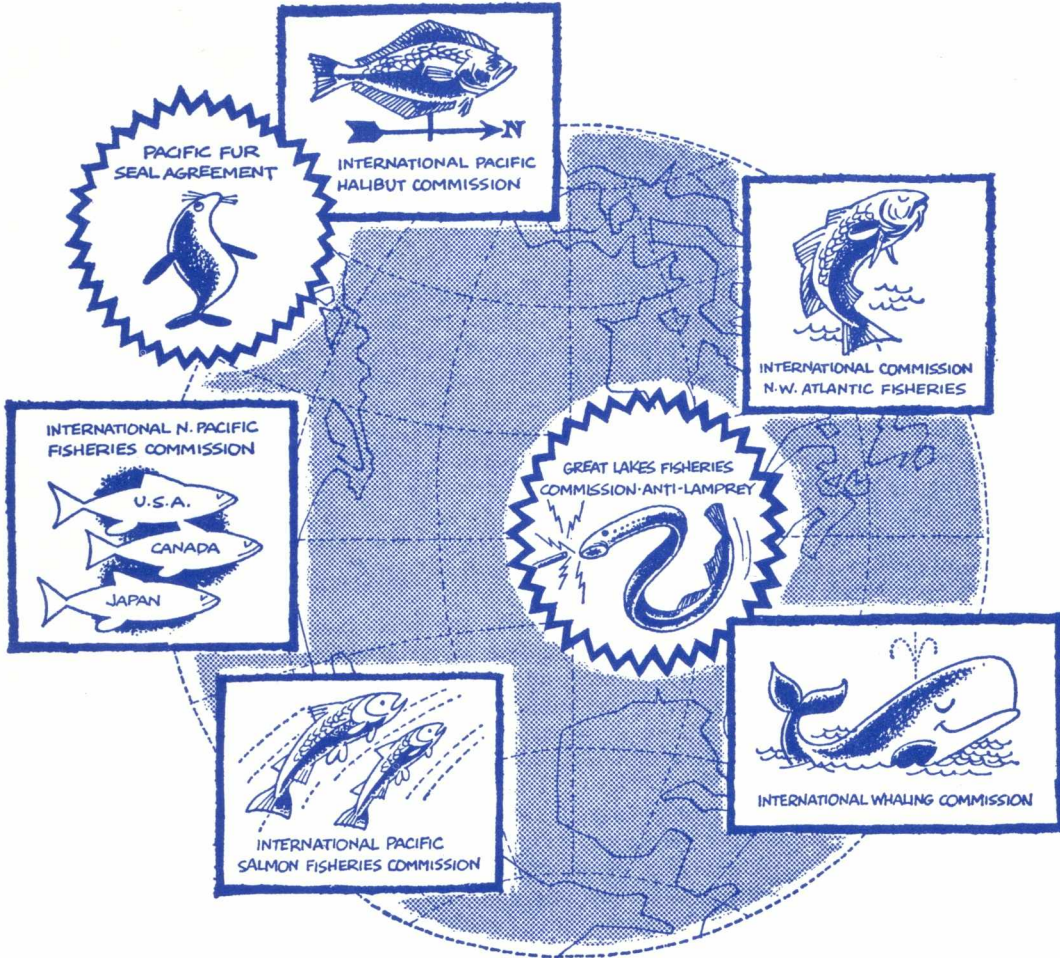
(Editor's Note: Before his untimely death in 1959, Dr. R.B. Miller, Head of the Department of Zoology at the University of Alberta and Chairman of the University Committee on Research, had served on a large number of national and international organizations connected with biology and particularly with fisheries. He was made a member of the National Research Council of Canada in 1956 and in 1957 he was elected Vice-President of the Wildlife Society of America and appointed a member of the Fisheries Research Board of Canada. He was posthumously elected a Fellow of the Royal Society of Canada. Dr. A. L. Pritchard is Director of the Conservation and Development Service of the Department of Fisheries of Canada.)

"Safety Manual for Fishermen, Captains and Owners of New England Fishing Vessels," adapted for the fishing industry by John J. Murray, (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.). This useful manual has been prepared in accordance with the safety philosophies and safety practices of industry as a guide, as information, and as an educational medium. It deals with fundamentals and presents, in condensed form, safety suggestions and practices which, it is hoped, will become common knowledge.

Cusneader

Deputy Minister.

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INTERNATIONAL CO-OPERATION **means wise use of fishery resources**

Canada has been a pioneer in the establishment of international commissions, the aims of which are to conserve and develop stocks of fish, sustaining their productive level whenever this is threatened by natural and human causes.

This country is a party to three bilateral fishery agreements with our neighbor to the south, and is also a member of four

international conventions which include other countries in addition to the United States.

Fish populations renew themselves if given the chance. The purpose of international co-operation is to make sure that they *are* given this chance . . . through practical programmes of scientific research and by common sense fisheries regulations.



DEPARTMENT OF FISHERIES
OTTAWA, CANADA