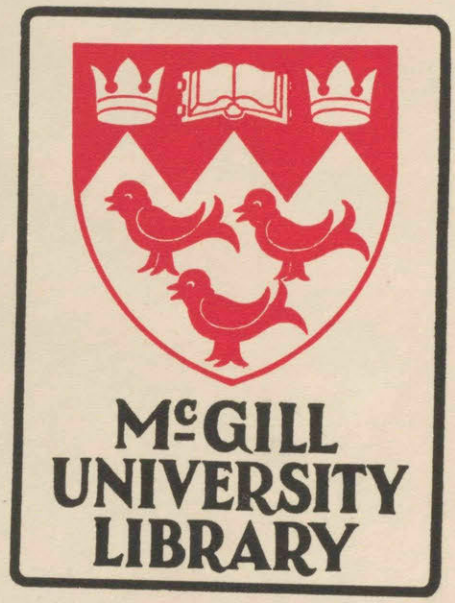

MARINE FISH OF ARCTIC CANADA

by

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A thesis presented as a partial fulfilment of the requirements for the degree of Master of Science in Zoology.

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History

A history of ichthyology in the North American Arctic reveals the very subordinate position which it has occupied to many other lines of endeavor. This can be explained by the fact, that even today there are no commercial fisheries in the arctic except in Greenland, and secondly the interest of early Europeans was directed toward the discovery of precious minerals and a short route to the riches of the far east. Since ichthyology has occupied this minor role, nearly all accounts of fishes are included in the narrative or appendices, as brief incidental items to the main story or purpose of the exploration. For this reason this paper will start with a review of some of the more important expeditions in the Canadian Arctic.

Probably the first Europeans to set eyes on the North American Arctic were the restless vikings, who colonized first Iceland and later Greenland in the ninth and tenth centuries. One of their number, Leif Eriksson reached the North American coast at a place, which he called Vinland. The location of Vinland is still much in dispute. Iceland maintained contact with Europe, but Greenland was not so fortunate. The full story of the fate of the Greenland colonists is still unknown. They had disappeared completely before Greenland's

rediscovery by Europe in the sixteenth century.

After the vikings, activity was at a standstill except for roving bands of eskimos. Discovery of America by Columbus in 1492 started a new wave of exploration. The Americas, which stood as a blockade to a short route to fabuously rich Cathay, must be explored because somewhere a water passageway must exist. England blocked to the south by Spain turned her attention to the north.

John Cabot discovered Newfoundland in 1497 and with this voyage England took a lead in Arctic discoveries.

Frobisher Bay was discovered by Martin Frobisher in 1576. He received financial support for two additional voyages to the same region, because among the rocks which he brought back to England was some iron pyrites, which a London alchemist identified as gold.

John Davis made three separate voyages of discovery in 1585, '86, and '87 respectively. He rediscovered Greenland and he navigated the strait, which bears his name, to latitude $66\frac{1}{2}^{o}$ north. His voyages opened a vast new area to the whaling industry.

Hudson Bay and Hudson straits bear the name of their discoverer, Henry Hudson. Henry Hudson made his ill fated voyage to Hudson Bay in 1610. His crew mutinied, and he was placed in an open boat along with the sick and the loyal men in his crew. No further trace of Hudson was ever found.

In 1615 and again in 1616 Baffin and Bylot were engaged

in voyages of discovery. Baffin passed through Davis straits and discovered and named Jones, Smith and Lancaster Sounds, three large sounds leading from Baffin Bay. His work was discredited and forgotten until the voyage of Sir John Ross in 1818 rediscovered the features described by Baffin.

The next event of major importance was the founding of the Hudson Bay Company in 1669. The company was incorporated on May 2, 1670. By Royal Charter the company was given an absolute monopoly over a vast area. The company remains in the region to this day. Data and collections gathered by the Hudson Bay company are a valuable source of information, but unfortunately the amount published is very small.

In 1721 Hans Egede led a band of forty men in an attempt to recolonize Greenland. Thus the Danes entered the Arctic region and their administration and the scientific development of Greenland serves as a model to neighboring arctic areas.

In 1722 Vitus Bering discovered Bering Straits, Russia was thereby added to the countries with territory in the North American Arctic.

In 1769 Hearne made his memorable trip down the Coppermine River to the Arctic sea.

Mackenzie discovered the river which bears his name and followed it to the polar sea in 1789.

The nineteenth century was a period of great activity in the Canadian Arctic. England made a determined

effort to negotiate the northwest passage by sending a large number of expeditions to that region during the first half of the century. Around the middle of the century a determined search was carried out for Sir John Franklin. The last part was spent in a steeple chase for the farthest north.

In 1818 Sir John Ross sailed into Baffin Bay and rediscovered many features described by Baffin. However, Ross' reputation as a seaman was damaged due to his mistaken notion that he saw all of the three sounds blocked by land.

Parry made his first voyage of discovery in 1819 to 1820. He sailed through Lancaster Sound and Barrow Strait discovering the North Georgia Islands, now called Parrys Islands, and Prince Regent Inlet. Winter quarters were at Winter Harbour on Melville Island.

Sir John Franklin in 1819 to 1822 led an expedition to the shores of the polar sea via the Coppermine River. They progressed to the eastward as far as Point Turnagain, a distance of five hundred and fifty miles. Present on the expedition were Back and Richardson. The suffering endured by this expedition is a well known story.

Parry took charge of another expedition in search of the northwest passage in 1821. He sailed into Hudson Bay by the way of the straits, thoroughly explored Repulse Bay and was finally forced to winter at Melville peninsula. The following summer he discovered Fury and Hecla Straits and then followed the strait to its western end and wintered at Igloolik.

Parry made his third and last attempt to discover the northwest passage in 1824 to 1825. He sailed from England in the Fury and Hecla. He sailed through Lancaster Sound and he was forced to winter at Port Bowen on the east shore of Prince Regent Inlet before returning to England.

In 1825 Franklin, Richardson and Back were again in the Arctic undaunted by their previous sufferings. This time the route was down the Mackenzie to the Arctic sea. Here the party was divided into two parts. Franklin and Back went to the west and reached Return Reef, where a delay caused by bad weather forced their return. Beechey's advanced party had reached Point Barrow, when Franklin had decided to return. Richardson continued eastward and explored the coast between Mackenzie and the Coppermine River.

Sir John Ross led another expedition in search of the Northwest passage in 1829. This expedition was forced to spend four winters in the arctic. He followed much the same route as Parry through Lancaster sound and down into Prince Regent Inlet, where he wintered at Felix Harbour. Ross passed Bellot straits without noting its existence. James Clark Ross, nephew of Sir John Ross, located the magnetic pole on Boothia peninsula.

Back descended the Great Fish River, now called Back River, to the sea in 1833, '34. The expedition was originally planned to ascertain the fate of Sir John Ross, but Back had learned of Ross' safe arrival in London before beginning the trip.

In 1836 the Hudson Bay Company started an energetic search by land for the northwest passage. Simpson and Dease were appointed to carry out this search. In 1836, Simpson and Dease descended the Mackenzie and turning westward they linked up the discoveries of Franklin and Beechey at Point Barrow. In 1838 Simpson and Dease set out from Fort Confidence on Great Bear Lake for the Coppermine River. They descended the Coppermine to the sea, turning eastward they passed Franklin's farthest point, Point Turnagain. They reached a portion of Victoria Island which they named Victoria Land before being forced to return. In 1839, the intrepid explorers again retraced their journey of the previous year, this time conditions favored them. They traced the coast to Back's Great Fish River and beyond to Point Castor and Pollux before returning.

Simpson 's career was cut short by his untimely death, the full circumstances of which are shrouded in mystery. The plan for completing the coastal survey was then passed on to John Rae for execution.

In 1846 John Rae left Churchill for Repulse Bay. He crossed the isthmus of Melville Peninsula, wnich now bears his name, to Committee Bay. He returned to Repulse Bay that same year, where he wintered. The following spring he explored the west side of Committee Bay to the southermost discovery of Sir John Ross. Then he explored the east coast to Fury and Hecla Strait.

The English admirality planned one last great expedition to discover the northwest passage. Sir John Franklin

was appointed to command this expedition. He sailed from England for the Arctic in 1845. His expedition consisted of two ships, the Erebus and Terror, and one hundred and twenty-nine men. Although Franklin was to fail and all his men perish miserably, the search for news of his fate was to add materially to our knowledge of the Arctic region. No other period has been so fruitful in scientific and geographical results as the ten years after 1847 when the search for Franklin was pushed with vigour.

No less than forty expeditions were dispatched during these ten years. They were financed by the British Government, Lady Franklin, and private individuals in the United States and elsewhere. These expeditions include many famous names in polar exploration. McClure completed the northwest passage although he was forced to abandon his ship. Collinson made important discoveries in the western arctic. John Richardson and John Rae carried on land expeditions in the Mackenzie and Coppermine districts.

The most ambitious effort of the British Admiralty was the four ship expedition commanded by Sir Edward Belcher in 1852. Belcher was a most unfortunate choice for commander, and except for the very able men who served under him the expedition would have ended in complete failure. As it was he unnecessarily ordered all four ships abandoned. Many sledging expeditions were carried out during the time the ships were frozen in at Northumberland Sound. Leopold McClintock,

the man most responsible for developing sledging in the arctic led several trips.

John Rae made three land expeditions. One was with Sir John Richardson from Mackenzie to Coppermine in 1848, one along the shores of Victoria Island in 1851, and the last one from Repulse Bay to the eastern side of King William Land where he obtained the first information concerning the loss of the Erebus and Terror.

In 1857 Leopold McClintock in the Fox, Lady Franklin's yacht penetrated to Bellot Strait and from there sledged to the eastern side of King William land and south to Montreal Island at the mouth of Back River. He brought back precise information concerning the fate of Franklin and his crew.

The end of the search for Franklin was to mark a new era in polar exploration. The northwest passage had been proven possible but impractical. Now the compelling urge was to reach the farthest north. The scene shifts from the Arctic coast of Canada to Smith Sound and the narrow waterway between Ellesmere Land and Greenland.

In 1852 Captain Inglefield penetrated Smith Sound as far north as Kanes Basin.

1853 to 1855 Kane entered Smith Sound with the avowed intent to search for Franklin and to reach the north pole. He reached only as far north as Kennedy Channel and thought that he saw an open polar sea to the north, which

focussed the attention on this region as the most likely area that an attempt on the north pole could be made.

In 1871 Charles Francis Hall led a third American expedition to the Smith Sound region. He sailed north to 82° 11' N before he was stopped.

Britain next decided to finance a determined attempt to reach the North Pole. An expedition was fitted out in 1875 consisting of two ships, the Alert and Discovery under command of Captain Nares. An attempt was made to have the ships fitted with gear for scientific exploration of the region. A special guide for scientific arctic work was compiled. The "Discovery" went into winter harbour in Lady Franklin Bay. While the "Alert" pushed northward to Floeberg Beach facing the polar sea. The supposed polar sea proved to be one of formidable ice packs. Nares reached latitude 83°20' N before turning back.

In 1872, the Austrian government outfitted the Tegetthoff for a north pole attempt. The route chosen was the Gulf stream to the north of Europe. The fate of this expedition has little to do with our narrative, except that aboard the ship was Lieutenant Karl Weyprecht. Lt. Weyprecht put forth a sound suggestion for international cooperation in scientific polar exploration. He suggested the establishment of a number of stations, where for one year a series of identical observations employing identical instruments could be carried out. This was probably the start of scientific effort being advanced as the primary justification for polar exploration. The first circumpolar year was in 1882 to 1883.

There were fifteen stations, eleven in the Arctic and four in the antarctic.

The Americans sent two polar year expeditions, one to Lady Franklin Bay on Ellesmere Island and one to Point Barrow. The Point Barrow expedition was quite successful. However, ill luck dogged the footsteps of the Lady Franklin Bay expedition. The crew underwent severe hardships and starvation due to the slow manner in which the war department conducted their rescue.

A second circumpolar year was not again attempted until 1932 when thirty-four nations cooperated.

In 1879 to 1882 the Jeanette commanded by DeLong made her fatal drift in the ice north of Alaska and Siberia. The revenue steamer, Corwin, made a number of discoveries in the Arctic region of Alaska during the search for the Jeanette. At various times between 1881 and 1884 the ship had aboard such well known American naturalists as E.W. Nelson, Townsend, and the geologist John Muir.

In 1891-2 Peary made his first expedition to Northern Greenland, which was to terminate in his attainment of the pole in 1909. Peary was smitten with a desire to reach the north pole, and although an indefagitable traveler, possibly more scientific results were accomplished by relief expeditions than by Peary.

Sverdrup in the Fram explored Jones Sound the last of the three great sounds discovered by Baffin to be investigated.

The expedition lasted from 1898 to 1902, a new series of islands, now known as the Sverdrup archipelago, were discovered, as well as scientific observations and collections made.

1903-05 Amundsen negotiated the northwest passage entirely by ship. He spent two winters at Gjoahavn on King Williams Land, making scientific observations in the region of the magnetic pole.

Canadian explorations have not been discussed previously. Much of the early Canadian exploration was done by the Geological Survey, which was founded and ably led by Sir William Logan. The early zoological explorations were carried out by geologists doubling as naturalists.

Dr. Robert Bell was a geologist active in the Canadian Arctic. He explored in the Hudson Bay Region in 1878-79. He was geologist and naturalist on the Hudson Bay expeditions conducted in 1884-5-6, under the command of A.R. Gordon.

In 1897 the Neptune under the command of William Wakeham was sent to Hudson Strait, Bay and Cumberland Gulf region. Robert Bell and A.P. Low explored the north and south side of Hudson strait respectively on this trip.

1903-4 A.P. Low in command of the Neptune made an expedition to Hudson Bay wintering at Fullerton Harbour, Hudson Bay. In 1904 the ship went north to Smith and Lancaster Sound.

The "Arctic" acting as a revenue steamer and flag

ship was sent on several expeditions to the arctic. In 1904-5 the "Arctic" was sent to Hudson Bay wintering at Fullerton Harbour. Two other expeditions were made by the "Arctic" under the command of J.E. Bernier. The "Arctic" took formal possession of the Parry Islands in 1906-07 and acted as a revenue schooner among the whalers. Again in 1908-09 the "Arctic" wintered at Parry's old quarters at Winter Harbour on Melville Island.

Stefansson and Anderson explored Victoria Land from 1908 to 1912.

The Canadian government sent an expedition to the western arctic from 1913 to 1918 under Stefansson, Bartlett and Anderson. Stefansson discovered new islands in the Parry archipelago, while scientific data and collections were accumulated by his colleagues.

1913 to 17 McMillan "Crocker Land" expedition proved the nonexistence of the land that Peary thought he had sighted to the north of Ellesmere Island.

1914 Explorations in James Bay were conducted by the Department of Marine and Fisheries under the charge of Lower and Melvill. The schooner Burleigh under the command of Nap. A. Comeau made a survey of a part of the Hudson Bay in the vicinity of Churchill the same year.

In 1920 Fritz Johansen carried out a fisheries survey for the Biological Board of Canada in the region of James Bay and Richmond Gulf.

Fritz Johansen was appointed naturalist aboard the "Larch" on a trip to Hudson Strait. The following year B. W. Taylor was appointed naturalist aboard the "Montcalm", on an expedition to Hudson Strait.

In 1930 H. B. Hachey conducted a hydrographic survey of Hudson Bay aboard the Loubryne.

In 1947 the Fisheries Research Board of Canada conducted a hydrographic survey of Ungava Bay under the leadership of Dr. Max Dunbar.

Knud Rasmussen conducted the Fifth Thule expedition in 1923-4. The northwest passage was negotiated by land and much scientific data was gathered.

Mention should be made here of the great commercial whale fisheries which followed in the wake of the explorers or even preceded them. The explorations of Davis was quickly followed by whaling ships into Davis Strait. Whaling north of Bering Strait commenced in 1848 and continued until the crash in the market price of whalebone just before the first world war.

Ichthyologists

The preceding section dealt with major explorations in the Canadian Arctic, this section will be concerned with major contributors to our knowledge of the fauna of that region. There are too many names to mention all the taxonomists who in the course of their work added to our knowledge of the ichthyofauna of the arctic. The base line for all taxonomic work in Zoology is Linnaeus' Systema Naturae published in 1758. Immediately following Linnaeus were a number of contributors

to systematic ichthyology. Cuvier, Walbaum, Pallas and Bloch were important early contributors. There were often errors in the locality from which the type specimen came in these early works. For instance, Bloch cited the type locality of several fishes to be the east Indies, which we now know to have originated from Greenland.

Otto Fabricius 1744 to 1822

Otto Fabricius was a Danish priest, who went to Greenland as a missionary. He was a missionary to the natives in the Frederikshaab district from 1768 to 1773. He learned the native language and was an excellent observer. His Fauna Groenlandica published in 1780 is the most quoted work on arctic fishes and is still valuable today to the student of ichthyology of that region.

Johannes Christian Hagemann Reinhardt 1776 to 1845

As a curator of the University of Copenhagen museum Reinhardt published a number of short articles on Greenland fish. Many of the forms occuring there were originally described by Reinhardt. He published in 1838 an Ichthyologiske Bidrag til den Gronlandske fauna, in which he included a catalogue of all the fishes known from Greenland.

Sir John Richardson 1787 to 1865

Sir John Richardson had a varied career. He made three trips to the Canadian Arctic, two with Sir John Franklin and one with John Rae in search of Franklin. Richardson was an observant naturalist and published a three volume work on the fauna of northern North America, one volume of which was devoted to fish.

Besides the Arctic he published on fishes from other parts of the world including China, Australia and Antarctica.

A brief mention should be made of other naturalists of this period, who published ichthyological appendices to the reports of various expeditions. Edward Sabine published the zoological appendices to Parry's first voyage. Captain James Ross is better known as an explorer in the Arctic and Antarctic, yet he wrote three zoological appendices, two to accounts of Parry's voyages and one to the second voyage of Sir John Ross.

Henrik Nicolaj Kroyer 1799- 1870

Kroyer made one voyage to Spitzbergen, the rest of his knowledge of Arctic fishes was gained by studying the collection of Greenland fishes which were sent to the Copenhagen Museum from Greenland. He succeeded Reinhardt as curator in 1845. He described several new fishes from Greenland as well as contributing to our knowledge of the fauna.

Christian Frederik Lutken 1827-1901

Lutken was connected with the University of Copenhagen as a professor in Zoology and curator in the museum. He contributed a number of articles on the fish fauna of Greenland. He added materially to the taxonomy of pelagic forms, notably the lantern fishes.

Tarleton Bean 1846-1916

Bean was an early taxonomist with the Smithsonian Institute in Washington D.C. He was sent to Alaska in 1880 to study the fish fauna. Besides publishing on the fishes

of Alaska, he published on several other small collections from the Arctic region.

There were a number of American naturalists who worked in Alaska at or near this time. They included John Murdoch, E.W. Nelson and Lucien M. Turner.

Lucien Mcshann Turner 1847- 1909

Turner was commissioned by the Smithsonian Institute to make natural history collections while engaged by the Army Signal Service. He collected in the Aleutians, St. Michaels, Alaska and Ungava Bay. He published only one Zoological paper on fishes, which was in his contributions to the Natural History of Alaska.

A.P. Low and Robert Bell were employed by the Canadian Geological Survey. Robert Bell did exploring in the Hudson Bay and Straits at various times between 1878 to 1900. A.P. Low did extensive explorations on the Labrador Peninsula.

David Starr Jordan 1851-1931

David Starr Jordan and his students dominated the American field of Ichthyology for over fifty years. He was an ardent field man as well as a prolific writer. He was in charge of the Fur Seal Investigation in Alaska for a number of years. Among his famous students were Henry Gilbert (1859-1928) who was co-author of the Fishes of Bering Sea and Barton Warren Evermann who was junior author of the Fishes of North and Central America.

Barton Warrn Evermann 1853-193

Evermann held a number of positions with the bureau of fisheries from 1886 to 1914 including the directorship of the Alaskan area. He visited Alaska and the Yukon in 1903 on a collecting trip with Dr. Jordan. From 1914 to 1932 he was director of the California Academy of Science.

Adolph S. Jensen 1886-

Jensen has been the most active of all ichthyologists in northern fisheries research. He conducted the Danish Government Fisheries investigation in Greenland in 1908 to 1909 in the Brig "Tjalfe". He has been connected with the University and museum in Copenhagen. He has published a number of articles on the rich collections from that region in the University museum.. His experience with the Greenland fisheries for nearly half a century has enabled him to evaluate a recent fauna change in that region.

Fritz Johansen

Johansen has been connected with a number of expeditions to different parts of the Arctic including the Mackenzie River region, Hudson Bay and Strait, and East Greenland. His only ichthyological publication is on his east Greenland work.

Vladim Vladykov

Vladim Vladykov direct contribution to northern ichthyology was a report of the ichthyofauna of Hudson Bay.

Collections of Arctic Fishes

The collections of Arctic fish are all small and many of the regions are uncollected or inadequately so. The

Greenland area is the best represented in collections.

The University of Copenhagen Museum has the largest collections but most of the specimens are from the Greenland region. A few specimens are present from the Canadian Arctic including the collection of the Fifth Thule Expedition.

The United States National Museum in Washington, D.C. contains a number of small collections which have been reported upon. These include the Kumlien collection from Cumberland Gulf, the Turner collection from Ungava Bay and the Bartlett collection from the eastern Arctic as well as various small collections from Arctic Alaska and Greenland. Through the kindness of Dr. L.P.Schultz the writer was permitted to examine the collections in the national museum.

The Royal Ontario Museum of Zoology in Toronto contains a number of specimens collected by different expeditions to the Hudson Bay Region and elsewhere. The Loubyrne collection is deposited in this museum. Dr. J.R. Dymond kindly permitted the writer to examine all specimens in the museum.

The material from the Canadian Arctic Expedition of 1913-18 is contained chiefly in the National Museum of Canada. This collection has been unreported in literature. Through the kindness of W. Earl Godfrey the writer was permitted to examine this collection.

The status of collections in the various museums in Europe was not determined. The British Museum contains isolated specimens from the Canadian Arctic. The Berlin

museum should contain specimens obtained on several expeditions to Greenland as well as exchange material.

McGill University, Montreal, Quebec, contains the collection made by Dr. Dunbar and the writer in Ungava Bay in 1947.

The Chicago Museum of Natural History contains the collection of the Rawson, McMillan, and Field Expeditions. These collections are chiefly from Labrador, Greenland and Baffin Island. A list of the fishes contained in this collection was kindly supplied by Mr. John Winn, the assistant curator of fishes.

Miscellaneous collections exist in other museums. The N.B. Scofield collection from Arctic Alaska and Herschel Island is deposited in the Stanford University Museum. The University of Michigan Museum contains a small collection from James Bay. Dr. Reeves Bailey kindly permitted the author to examine this collection. Information on collections in the American Museum of Natural History was supplied by Dr. J.T. Nichols. This consisted chiefly of a collection from Hudson Bay.

Review of Literature

The literature concerning Arctic fishes is very scanty and widely diffused into numerous small articles, and in narratives of travel and explorations in the Arctic Regions. Many of these are no more than the briefest of faunal lists. The literature is published in French, German, English,

Danish and Russian. Russian literature, while being quite extensive was not used, except where a resume was published in French, English or German. However all the Russian literature on ichthyology is confined to the seas around Russia, an area with which this paper is only indirectly concerned.

The areas most adequately covered by literature are the Greenland and Spitzbergen area. This review of literature will not be on a strictly chronological basis, but rather on a regional basis.

Thomas Pennants Arctic Zoology published in 1785 was the first attempt at an overall coverage of the Arctic region. The two volume work was followed by a second edition in 1792. Pennant originally intended to publish on American Zoology, but when the American colonies revolted he changed the title to Arctic Zoology and added a few addition notes on the Arctic. The fish coverage was composed of notes on Greenland fish gleaned from Fabricius' Fauna Groenlandica and brief notes on Hudson Bay fish. His brief mention of fifteen fish from Hudson Bay includes some which are obviously in error, such as Salmo salar and Lophius piscatorius. The rest are mostly fresh water and anadromous fish.

E. Ehrenbaum (1902) published on Fishes in Fauna Arctica (Romer and Schlaudin). 186 species of fish were discussed, many of which are Atlantic or subarctic in distribution.

Sir John Richardson published his three volume work Fauna Boreali Americana in 1836. The third volume was

devoted entirely to fish. Richardson was familiar with Arctic coast in the Coppermine, Mackenzie region having visited that area twice. This book along with Otto Fabricius' Fauna Groenlandica are important basic works for the study of the northern ichthyofauna.

A. Halkett in 1913 published a checklist of the fishes of Canada, which included the Arctic Region as well.

The northern high arctic regions from Lancaster Sound northward are discussed in only a few brief articles. Edward Sabine (1824) wrote the brief appendix to Parry's first voyage of discovery, which wintered at Melville Island. Sir John Richardson wrote the appendix to Belcher's Last of the Arctic voyages on the fishes taken at Northumberland sound which is located on the North west coast of Devon Island. A. S. Jensen (1910) published the ichthyological results of the Sverdrup expedition in the Jones Sound region. This contained a taxonomic discussion of the forms obtained. Albert Gunther (1877) published the ichthyological results of the British arctic expedition of 1875. He described two salmonids as new.

Holmquist (1898) compiled a list of the fishes collected during the Peary Relief expedition of 1894.

H. W. Fowler (1914) published the ichthyological results of the Peary Relief expedition of 1899. He described two cyclopteroid fishes as new.

J. T. Nichols (1919) wrote an article on the fishes of north-east Greenland. This collection was made by the Rawson, McMillan "Crocker Land" expedition and most of the specimens were collected at Etah, Greenland.

The literature on the fishes of Baffin Island is very meagre. Bean (1879) published on fishes of Cumberland Gulf. A. Halkett (1928) published on a small collection of fishes made by J.D. Soper in Southern Baffin Island. T.H. Manning (1942) published a few notes on fishes collected on southern Baffin. M. J. Dunbar (1947) reported on a collection of planktonic fish, most of which originated from Lake Harbour, Baffin.

The Bartlett collection from Fox Basin and the eastern Arctic was reported upon by S. F. Hildebrand (1939).

Hudson Bay is the best investigated region in the Canadian Arctic. Vladim Vladykov summed up the knowledge of Hudson Bay fish from collections and literature in 1933. Among the people, who published on Hudson Bay fish are the following:

Forster (1773) Rae (1855), Bean (1882), Bell (1879-1901), Low (1889-1906), Melvill (1915), Lower (1915) Comeau (1915), Huntsmen (1918), Halkett (1920), Cox (1920-1922), Bajkov (1928), Henn (1932) and Dymond (1933). These papers are all very short, some of them merely brief annotated lists, others are systematic details of certain groups. None of these papers give a survey of the entire area.

The central part of the Canadian Arctic from Melville peninsula to the Coppermine River is the least known section of the Canadian arctic. James Ross (1835) wrote the zoological results of Sir John Ross's second voyage of discovery, except for the Salmones, which was written by Sir John Richardson. Richardson (1836) wrote the ichthyological results of Back's trip down the Great Fish River.

The western Arctic from Herschel Island to the Coppermine River is better known and better represented in collections. Richardson (1823) wrote the appendix to Sir John Franklin's first journey to the Polar sea. He later summed up his knowledge of the fish fauna gained on two trips to this region in his Fauna Boreali Americana Vol. 3. published in 1836. John Macoun (1888) supplied a list of fishes known to occur in the Great Mackenzie Basin to a committee of the Canadian Senate investigating the resources of that region. R. M. Anderson wrote the appendix appearing in Stefansson's My Life with the Eskimos published in 1913.

Arctic Alaska is covered by only a few published papers. T.A. Bean (1883) supplied a list of fishes known to occur along the arctic coast of Alaska for the report of the Revenue Steamer Corwin. John Murdoch wrote up the ichthyological results of the international expedition to Point Barrow in 1883. N. B. Scofield (1898) wrote a report on a collection of fish made by himself on a trip to Herschel Island, N.W.T.

along the coast of Alaska. H. W. Fowler (1907) published a report on a collection of fish made at Point Barrow, Alaska. He described a new subspecies of Oncocottus.

A number of papers have been written on the fish fauna of Greenland. Greenland is much better known than any other region in the North American Arctic.

Otto Fabricius published his excellent work, Fauna Groenlandica in 1780. He considered forty-four species of fish. J.C.H. Reinhardt (1838) published a catalogue of Greenland fishes in (Ichthyologiske Bidrag til Gronlandske Fiskefauna) in which he considers 61 species of fish. J.T. Reinhardt compiled a list in 1857 in which he lists 69 species. Lutken (1875) compiled a list for the British Arctic Expedition of 1875 in which he lists 78 species. Ad. S. Jensen (1926) compiled the latest list of Greenland fish in which he lists 98 species.

Besides these main catalogues there have been a number of fauna surveys of limited areas in Greenland. Noteworthy are Van Hoffen (1898) survey of the Umanak district; Jensen (1903) Fishes of East Greenland; and Fritz Johansen (1914) Ichthyological results of the Denmark Expedition to Northeast Greenland.

There have been numerous articles on the systematics distribution and biology of different species of fish occuring in Greenlandic waters. J.C.H. Reinhardt published a number of short articles between the years of 1830 to 1845 in which

he records and describes many species of fish obtained from Greenland. Kroyer, who succeeded Reinhardt at the Copenhagen Museum published a few brief articles on the Ichthyofauna of Greenland. Chrs. Lutken (1875-1901) reviews a number of groups of fishes occurring in Greenland waters in a series of short papers. Ad. Jensen (1898--) has published a large number of papers on Greenland ichthyology. He has monographed certain groups such as the Lycodidae (1903) Selachians (1914) Lumpenidae (1944) and a number of the genera of fishes occurring in Greenland. He has carried out and reported on practical fisheries work. He has discussed thoroughly the biology of two important Greenlandic food fishes, Sebastes marinus (1922) and Reinhardtius hippoglossoides (1935).

H. G. Dresel (1884) published a paper on some Greenland fish, in which he sets forth a detailed taxonomic description. His work is much quoted by American authors. L. Pietschman (1932) gives a systematic appraisal of a collection made in Davis Strait.

There are other papers which are not concerned chiefly with the arctic which the author has drawn on heavily for material. Among these are Jordan and Evermann four volume work on the fishes of North and Middle America published from 1896 to 1900. Jordan, Evermann and Clark (1930) Checklist of the Fishes of North and Middle America has been used extensively. The taxonomic scheme of this work has

followed the above work, except where recent revisions indicate a change. E. Ehrenbaum (1903) Nordisches Plankton has been invaluable in identifying planktonic fish collected in Ungava Bay.

A large number of other papers dealing with different parts of the European and Russian arctic have been consulted. They are all listed in the bibliography and will not be discussed here.

Introduction and Methods

The area encompassed by this report includes all of the marine waters north of the northern coast of Canada from Alaska on the west to the west coast of Greenland on the east. While recognizing that faunal and hydrographic conditions are different in southern west Greenland due to the influence of the Atlantic water, the area was included in this report for three reasons. First, the Greenland west coast is the only area well investigated in the proximity of relatively unknown Canadian arctic waters, thus comparisons and inference can be made from its known fauna to the Canadian area. Secondly, West Greenland makes a well defined boundary to our area. Thirdly, the Canadian Islands of Baffin and Ellesmere are in part separated from Greenland by only narrow straits of water.

A great lack of exploration is evident in the Canadian Arctic, many regions are known only vaguely if at all. This paper is concerned with a survey of the existing knowledge of the Canadian Arctic fish fauna amplified by field collections and observations of the author in the Ungava Bay area.

Strictly freshwater fish are unknown in the Canadian arctic archipelago, which can be explained by the fact that only salt tolerant forms could recolonize these islands after glaciation. The arctic charr (Salvelinus

alpinus) is the most common of the anadromous fishes in the Canadian arctic. Sticklebacks (Gasterosteidae) are common residents of brackish and freshwater streams, and are often found in marine waters.

Along the Canadian north coast, whitefish (Coregonidae) are often found in marine waters. In the Hudson Bay region they spend a portion of the summer season in marine waters. The coregonidae are strictly freshwater forms further south. Many marine forms are tolerant of fresh water. Sculpins are often found most abundant where small fresh water streams drain into the sea. Relict forms of Oncocottus quadricornis, a common arctic sculpin, are found in fresh water in the Baltic sea area. Liopsetta glacialis a common arctic flat fish occasionally enters rivers and streams. The above discussion shows the paucity of strictly freshwater forms in the Arctic. All forms will be discussed here that are found in salt water, even if their primary habitat is fresh water.

Classification as used in this paper was taken from Jordan, Evermann and Clark's Check List of the Fishes and Fishlike Vertebrates of North and Middle America (1930), except where more modern revisions of groups indicated a change. The descriptions of many arctic forms are inadequate. Some of the forms recognized in this paper will undoubtedly be reduced to synonymy when better known, but no useful purpose is accomplished until such a reduction can be done with certainity.

The method of discussion adopted by the author is one of an annotated list of the species occurring in the Canadian Arctic.

The writer spent two and one half months in the summer of 1947 in Ungava Bay in the Canadian Eastern Arctic. He was a member of a hydrographic survey party under the charge of Dr. Max Dunbar. A number of methods of collecting were tried to obtain information concerning the fish fauna of that region.

Long lines fitted with codfish hooks were laid at several places along the east and west coast of Ungava Bay. This method of collecting was unprofitable due to the scarcity or absence of the Greenland Cod (Gadus ogac).

Line fishing (jigging) was tried in various sections of the bay. This method was especially productive in obtaining sculpins. In the Port Burwell area where the Atlantic cod (Gadus callarias) was abundant large numbers of this species were taken by jigging.

Seine nets were used with little success due to the rocky bottom.

Hand collecting in the tidal zone proved quite profitable for species such as small sculpins and sea snails (Liparidae).

Dredging with a small hand dredge produced a few bottom fish such as sculpins, sea poachers (Aspidophoroides olriki) and Eumicrotremus.

Numerous larval fish were taken in plankton nets hauled at different depths.

Much knowledge of the fish fauna was obtained by examining the contents of Atlantic cod stomachs obtained at Port Burwell. Many species taken nowhere else were obtained from cod stomachs.

The writer spent 28 days in March and April 1948 fishing with gill nets under the ice in freshwater lakes in the Ungava Bay region. The purpose was to obtain information of the winter habitat of some anadromous fish of that region.

The material gained on these trips was brought back to Montreal and is now deposited in the zoology department museum at McGill University. Material difficult to identify was taken to other museums for comparison.

The author examined material in collections of other museums in the United States and Canada.

CLASSIFICATION

Myxinidae
1. Myxine glutinosa Linnaeus
Petromyzonidae
2. Petromyzon marinus Linnaeus
Squalidae
3. Squalus acanthias Linnaeus
4. Centroscyllium fabricii (Reinhardt)
Somniosidae
5. Somniosus microcephalus (Bloch and Schneider)
Rajidae
6. Raja radiata Donovan
7. Raja fullae Lutken
8. Raja hyperborea Collett
9. Raja lintea Fries
10. Raja spinicauda
Acipenseridae
11. Acipenser fulvescens
Clupeidae
12. Clupea harengus Linnaeus
13. Clupea pallasii Cuvier & Valenciennes
Salmonidae
14. Oncorhynchus gorbuscha (Walbaum)
15. Oncorhynchus keta (Walbaum)
16. Salmo salar Linnaeus
17. Salvelinus fontinalis (Mitchill)
18. Salvelinus alpinus (Linnaeus)
Coregonidae
19. Stenodus leucichthys (Guldenstadt)
20. Leucichthys autumnalis (Pallas)
21. Leucichthys sardinella (Valenciennes)
22. Leucichthys artedi (LeSueur)
23. Coregonus clupeaformis (Mitchill)
24. Prosopium cylindraceum (Pallas)
Osmeridae
25. Mallotus villosus (Muller)
26. Osmerus dentex Steindachner
Microstomidae
27. Nansenia groenlandica (Reinhardt)
Bathylagidae
28. Bathylagus benedicti (Goode & Bean)
Stomiatidae
29. Stomias boa (Risso)
Gonostomidae
30. Cyclothone microdon (Gunther)
Sternoptichidae
31. Argyropelecus olfersi (Cuvier)

Notacanthidae
32. Notacanthus chemnitzi Bloch
33. Notacanthus rostratus Collett
Anguillidae
34. Anguilla bostoniensis Le Sueur
Synaphobranchidae
35. Synaphobranchus pinnatus (Gronow)
36. Histiobranchus infernalis Gill
Saccopharyngidae
37. Saccopharynx ampullaceus (Harwood)
Paralepidae
38. Paralepsis coregonoides borealis (Reinhardt)
39. Paralepis risso kroyeri Lutken
Myctophidae
40. Lampanyctus elongatus (Costa)
41. Lampanyctus crocodilus (Risso)
42. Myctophum arcticum (Lutken)
43. Myctophum glacialis (Reinhardt)
Alepisauridae
44. Alepisaurus ferox Lowe
Macrouridae
45. Coryphaenoides rupestris Gunner
46. Macrourus berglax Lacepede
47. Macrourus aequalis Gunther
48. Macrourus goodei Gunther
Gadidae
49. Gaidropsarus ensis (Reinhardt)
50. Gaidropsarus septentrionalis (Collett)
51. Ciliata argentata (Reinhardt)
52. Boreogadus saida (Lepechin)
53. Boreogadus agilis (Reinhardt)
54. Arctogadus pearyi (Nichols & Maxwell)
55. Pollachius virens (Linnaeus)
56. Eleginus gracilis (Tilesius)
57. Gadus callarias Linnaeus
58. Gadus ogac Richardson
59. Melanogrammus aeglefinus (Linnaeus)
60. Molva molva (Linnaeus)
61. Brosmius brosme (Muller)
Trachypteridae
62. Trachypterus arcticus (Brunnich)
Lampridae
63. Lampris guttatus (Bonnaterre)
Pleuronectidae
64. Reinhardtius hippoglossoides (Walbaum)
65. Hippoglossus hippoglossus (Linnaeus)
66. Hippoglossoides platessoides (Fabricius)
67. Platichthys stellatus (Pallas)
68. Liopsetta galcialis (Pallas)
69. Glyptocephalus cynoglossus (Linnaeus)

Gasterosteidae
70. Gasterosteus aculeatus Linnaeus
71. Pungitius pungitius (Linnaeus)
Scorpaenidae
72. Sebastes marinus (Linnaeus)
Icelidae
73. Artediellus uncinatus (Reinhardt)
74. Icelus bicornis (Reinhardt)
75. Triglops pingeli Reinhardt
76. Triglops nybellini Jensen

Cottidae
77. Myoxocephalus scorpius (Linnaeus)
78. Myoxocephalus scorpioides (Fabricius)
79. Porocottus polaris (Sabine)
80. Oncocottus quadricornis (Linnaeus)
81. Gymnocanthus tricuspis (Reinhardt)
82. Gymnocanthus pistilliger (Pallas)
83. Cottunculus microps. Collett
84. Cottunculus thompsonii (Gunther)
Agonidae
85. Leptagonus decagonus (Bloch & Schneider)
86. Aspidophoroides olriki Lutken
87. Aspidophoroides monopterygius (Bloch & Schneider)
Cyclopteridae
88. Cyclopterus lumpus Linnaeus
89. Eumicrotremus spinosus (Muller)
90. Eumicrotremus derjugini Popov
91. Cyclopteropsis malcalpini (Fowler)
92. Lethrotremus armouri Fowler
Liparidae
93. Liparis atlanticus (Jordan & Evermann)
94. Liparis tunicatus Reinhardt
95. Liparis major Gill
96. Liparis cyclostigma Gilbert
97. Liparis herschelinus Scofield
98. Careproctus reinhardti Kryer
Ammodytidae
99. Ammodytes lancea Cuvier
Pholidae
100. Pholis gunnellus Linnaeus
101. Pholis fasciatus (Bloch & Schneider)
Stichaeidae
102. Stichaeus punctatus (Fabricius)
103. Eumesogrammus praecisus (Kroyer)
Lumpenidae
104. Lumpenus maculatus (Fries)
105. Lumpenus lampetraeformis (Walbaum)
106. Lumpenus fabricii (Reinhardt)
107. Lumpenus medius (Reinhardt)

Anarrhichadidae
108. Anarrhichas lupus Linnaeus
109. Anarrhichas minor Olafsen
110. Anarrhichas denticulatus Kroyer
Zoarcidae
111. Lycodes vahlii Reinhardt
112. Lycodes reticulatus Reinhardt
113. Lycodes esmarkii Collett
114. Lycodes eudipleurosticus Jensen
115. Lycodes seminudus Reinhardt
116. Lycenchelys infolfianus Jensen
117. Lycodalepis polaris (Sabine)
118. Gymnelis viridis (Fabricius)
Brotulidae
119. Bythites fuscus Reinhardt
Ceratiidae
120. Ceratias Holbolli Kroyer
Himantolophidae
121. Oneirodes eschrichtii Lutken
122. Himantolophus groenlandicus Reinhardt

Discussion by Species

Myxine glutinosa Linnaeus Hagfish
Myxine glutinosa Linnaeus Syst. Nat. ed X, 1758, 650

Range: In general, the genus Myxine inhabits the North Atlantic from Davis Straits southward in deepwater along both coasts to at least North Carolina on the Atlantic side. In our region, it was first recorded by Fabricius (1780) from the Frederikshaab district. Reinhardt (1838) records a specimen from the Julienehaab district. This species is known from the Davis Strait in the deep water warmed by the west Greenland current.

There appears no description in literature of specimens of Myxine taken in Greenland waters. Ad. S. Jensen (1926) identifies specimens taken in Davis Strait (66°37' N.Lat., 56° 37' W Long., depth 450 meters) as the European form M. glutinosa.

Petromyzon marinus Linnaeus Sea lamprey

Petromyzon marinus Linnaeus Syst. Nat. ed. X, 1758,230, European Seas

Range: In general, the Atlantic coasts of Europe and America, ranging from Greenland, south to Florida in the western Atlantic. In our region, the sea lamprey is a rare form. Lutken (1875) states that the Copenhagen museum had received two specimens sent in from south Greenland. This form has yet to be taken in the Canadian Arctic region. That it may occur in the Ungava Bay region is indicated from information gathered from the natives in the winter of 1948 by the writer.

The lamprey is an anadromous form spawning in fresh water; whether it has spawned successfully in Greenland was not stated in the literature consulted.

The Petromyzontidae are represented by other forms in the Mackenzie River and Yukon River District. A single specimen of a lamprey in the Royal Ontario Museum of Zoology was collected at Aklavik, N.W.T. This form was provisionally identified by Dr. Carl L. Hubbs as Entosphenus japonicus. Species of the genus Lampetra occur in the Yukon, but none have been recorded from the rivers of Arctic Alaska or Canada.

Cetorhinus maximus (Gunner) Basking shark.

The basking shark has erroneously been listed from Greenland waters since Fabricius (1780). Fabricius recorded the shark on the basis of tales told him by the natives. This fish should be deleted from the list of arctic fish, although it occurs at Iceland and northern Norway.

Squalus acanthias Linnaeus Spiny dogfish
Squalus acanthias Linnaeus Syst. Nat. ed X, 1758, 233
coasts of Europe

Range: In general, the North Atlantic on both coasts south to the Bay of Biscay and Cuba. In our region the spiny dogfish is a rare form. Although recorded by Fabricius (1780) and Reinhardt (1838), there is some doubt as to the identification of the forms on which their records were based. Jensen (1914) lists two localities from which there were specimens in the museum in Copenhagen, Sarfangûak, south of Holsteinsborg, and Sukkertoppen. In recent years this form has been more abundant due to a climatic change.

Five specimens were sent to the Copenhagen museum between the years 1931 to 1936. Specimens were taken in the Holsteinsborg and Christianhaab districts, and, at Ikerasak in Umanak Fjord.[1]

The spiny dogfish is a migratory fish, its movements are governed by the fish on which it feeds. Dogfish are extremely voracious attacking commercial fish, and are a constant source of loss and nuisance to fishermen in more southerly regions. Their occurrence in our region is still too rare for them to have any economic importance.

Centroscyllium fabricii (Reinhardt) Black dogfish
Spinax fabricii Reinhardt Dansk. Vid. Selsk Forh. III 1828
XVI Greenland

Range: In general from Greenland south to Gloucester and the Nova Scotian Banks, and east to Iceland, Faroes and Hebrides Islands. In our region, Jensen (1914) lists the black dogfish as occurring in the southern part of Davis Strait outside the Fyllas Banks, also specimens were taken in Bredefjord in the northern part of the Julianehaab district.

The shark is typically a deep water form preferring the "warm" water in the Davis Strait south of the submarine ridge between Greenland and Baffin Island. Jensen (1914) lists depths from 100 to 737 fathoms.

The black dogfish is viviparous. Jensen (1914) reports a gravid female taken in February with embryo's 124mm. long.

[1] Jensen, Ad. S. Concerning a Change of Climate in Recent Decades p 18

Somniosus microcephalus (Bloch & Schneider) Greenland shark
Squalus microcephalus Bloch and Schneider Syst. Ichth. 1801, 135, northern seas

Range: In general the Arctic seas south to Cape Cod, San Francisco and France. In our region the Greenland shark is very common. Jensen (1914) listed the occurrence of the Greenland shark along the entire west coast of Greenland from Cape Farewell in the south to Wolstenholme Sound in latitude 76° 30' north. It is common in the fjords and good way out into the straits. Vladim Vladykov (1933) reported a specimen taken by Fritz Johansen at Port Burwell in October 1927, the spines and teeth of which were preserved. Records from the rest of the Canadian arctic are based on sight records only.

Turner[1] states: "A large individual of this species was caught August 30, 1883 in a net set for salmon at the mouth of the Koksoak River. A second individual was obtained on August 10, 1884 a few miles further up the Koksoak in one of the nets set for salmon. Indians report these sharks are found in the vicinity of Fort George on the Whale River (Hudson Bay)."

The writer was told during his stay in Ungava Bay in 1947 that sharks were very common at Port Burwell, and were often caught in seal nets in the fall. The Hudson

[1] Turner, L.M. Unpublished Manuscript 1885
An attempt was made by the author in 1947 to locate the specimen on which Turner's record was based. The specimen was identified by T.H. Bean and entered in the U. S. National Museum Catalogue, although the specimen is no longer extant there appears to be little doubt as to its proper identification.

Bay Factor's wife at Payne Bay state's that the natives some times take sharks off the mouth of Payne River. Bob May the Hudson Bay Factor at George river reports that he saw a dead shark off the mouth of George River in the winter of 1948. The opinion of the natives, as stated by Bill Saunders to the author, is that a few sharks follow the salmon run into the rivers every year in the Ungava Bay region, and that one or two sharks are left stranded in the Koksoak every year.

Two sight records for Baffin Island exist in literature. The Department of Interior report on the Canadian Eastern Arctic gives a RCMP constable's report of seeing a shark swimming in the waters of Pond Inlet in the summer of 1933. Harry Ford, a factor of the Hudson Bay Company at Clyde Inlet , on the east coast of Baffin Island, in replying to a questionaire of the Royal Ontario Museum of Zoology reported a ground shark as occurring in that region.

That this shark is not an uncommon resident in Hudson Bay is indicated by various sight record reports. Bob May, who spent some time at Port Harrison on the East Coast of Hudson Bay, reports that small sharks were often seen during the walrus hunts. G. M. Sutton told the writer that sharks were known by the natives of Southampton Island.

The sight record reports as outlined would indicate a greater range for the shark than is known from existing specimens. Possibly, the shark being a migratory form is

found in all localities suitable to the larger marine mammals such as the walrus.

The Greenland shark is typically a bottom form, it is very rarely seen on the surface. However, during whaling operations it is sometimes seen on the surface, where it gouges out hunks of flesh from the dead whales. This has probably given rise to the stories that the shark is a determined enemy of the whales. Scoresby (1820) reports that the shark bites and annoys the whale when living and eats it when dead. This is probably the basis of Jordan and Evermann statement in their Fishes of North and Middle America that this species regularly attacks whales. Equally false are the stories of attacks on native fishermen in kayaks as reported by Richardson (1836) and others. The natives of Greenland show no fear of this sluggish animal, regularly fishing for it from kyaks. It offers little resistance when hooked.

Hofsten (1919) reported this form as being common down to 550 meters. Hjort (1902) reported a capture at 1000 meters. Saemundson (1909) stated that along the Iceland coast this form winters in toward the coast while in the summer it seeks greater depths.

Food: This fish is a great carrion eater, the more putrid and ill smelling the better. Its greatest abundance are in areas where whale and seal fisheries are in operation. Besides carrion it feeds on ground fishes

such as halibut and cod in Greenlandic waters. It is apparently able to catch live seals as whole ones are often found in its stomach and where sharks gather, seals soon become very scarce.[1]

Reproduction: Nothing is definitely known concerning breeding habits. Females have been obtained containing a great number of eggs (up to the size of a goose egg) and has led to the belief that this form is oviparous.[2] Fabricius and Faber two early workers on the fauna of Greenland and Iceland respectively stated that the form was viviparous. Lutken (1879) summed up the evidence concerning reproduction in the shark, and as he could find no evidence of any shark caught with embryos present and no evidence of a protective integument on the eggs as present in rays, he concluded that it must lay its numerous soft globular eggs in the soft mud at the bottom of the deep sea. The concensus of opinion today is that the shark is viviparous due to the fact that a closely related species S. brevipinna has proven viviparous.[3]

Economic importance: The Greenland shark has long been of economic importance to the Greenlanders. Oil was first extracted from the liver in 1805. The Danish trading company has long bought the liver for its oils. Within the

1. Bigelow & Welsh Fishes of the Gulf of Maine p 54
2. ibid p 54
3. ibid p 54

present century, the company has also purchased shark skins. When tanned the sharkskins make fine upholstery leather. Jensen (1914) estimated that the average annual catch of Greenland sharks for the years 1907-12 was 32,000 sharks. In 1928 the annual catch appeared to be around 35,000 sharks.[1] Dunbar (1947) states that since 1900 an average of about 650 metric tons of shark liver has been taken.

The great shark fisheries couldn't have been developed in Greenland except by primitive boats and fast ice in the winter, which makes the cost of obtaining sharks so cheap.

The meat of the shark is dried and used by the natives for dog food. Fresh shark meat makes the dogs violently ill producing what is known as "shark intoxication". The exact nature of these toxins are unknown, also the reason why dried meat can be eaten with impunity and fresh cannot.

Raja radiata Donovan
Raja radiata Donovan Hist. Britl Fish V. 1820 Great Britain.

Range: In general, Davis Strait, Hudson Bay, South to Great Britain and the Gulf of St. Lawrence. In our region the form was first reported from the Frederikshaab district of Greenland by Fabricius (1780) as Raia fullonica. Jensen (1914) states that this ray is known from Frederikshaab, Godthaab Fjord, and many places along the coast from 59°55' N. Lat. to 69° 17' N. and in the middle of the strait from 56° 30' N. to 66° 45' N. Lat. Van Hoffen's identification of

1. Greenland Vol 1 Kbhvn

R. radiata from Umanak fjord is an error, the correct identification is R. hyperborea.[1]

Vladykov (1933) lists a record from Hudson Bay. Rev. W.G. Walton obtained this specimen from just south of Richmond Inlet, Hudson Bay and the skin was identified by Dr. Bigelow as R. radiata.

Hofsten (1919) gives the vertical distribution of this form as being mainly between 30 to 200 meters with it being recorded from 10 to 839 meters. According to Jensen (1914) this ray is confined to the warmer waters of Davis Strait. Its occurrence in Hudson Bay is a little surprising, however additional specimens may prove that the Hudson Bay form is distinct.

Raja fyllae Lutken
Raja fyllae Lutken Vid Medd. Naturh. Foren Kbhvn. 1887, 1
Davis Strait 65 35' N 54 50' W Depth 75 fm.

Range: In general, Davis Strait, Danmark Strait, and Faeroe Islands to Skagerak. In our region this ray is known only from Davis Strait. These localities are all south of the submarine ridge between Greenland and Baffin Island, where the bottom temperature is 3°C or more. Jensen (1914) gives a vertical distribution of 75 to 582 fathoms in Davis Strait.

This is one of the rarer rays in Greenlandic waters and has no economic importance.

1. Jensen Selachians of Greenland

Raja hyperborea Collett
Raja hyperborea Collett Forhandl Vid. Selsk. Chris. 1878 No. 14 p 7 North Atlantic

Range: In general, the North Atlantic deep basin and Davis Strait. In our region, Jensen (1914) summarizes its occurrence as follows, on the north it has been taken from Jacobshavn to Upernavik and on the Southwest coast of Greenland at Nuk in Ilua fjord (60° 12') near cape Farewell. This discontinuous distribution is accounted for by its preference for the colder water. Jensen (1914) states that this fish has been taken from 1309 fathoms upward, the boundary of its distribution coincides with the boundary of the cold polar water and the overlying gulf stream, a distribution which is well shown in Greenland waters.

The food consists of small fish and crustacea

Economic importance: None

Raja lintea Fries
Raja lintea Fries Kgl. Sv. Vet Acad. Handl. 1838 p 154

Range: In general, Greenland and the northern coasts of Europe to the Skagerak. In our region this fish has been recorded in Davis Strait west of Store Hellefiske Bank.. Jensen (1914) Raja ingolfiana described from Davis straits by Lutken in 1898 is synonymous. Jensen (1914) states that this fish has been recorded from depths of 225 to 319 fathoms and it frequents positive temperatures of 3°C. or more.

Raja spinicauda Jensen
Raja spinicauda Jensen Mindeskr. fur J. Steenstrip 1914 p30
Davis Strait 64° 14' N.l. 55°55' W. long. 440 fm

Range: This form is known only from Davis Strait

south of the submarine ridge, where the bottom temperatures are a positive 3° C or more.

Jensen (1914) is of the opinion that the egg cases of this ray are the basis of Fabricius (1780) Zeus galleus, which be recorded on the strength of native tales.

This rare fish inhabits of the deeper water of Davis Strait from 125 to 440 fathoms and has no economic importance.

Acipenser fulvescens Rafinesque Sturgeon
Acipenser fulvescens Rafinesque Amer. Monthly Mag. I Agu. 1817, 288 Great Lakes.

Range. In general, fresh water from the Mississippi Valley northward to Hudson Bay and Saskatchewan. In our region, this form occurs in the brackish river mouths of streams in the James Bay area. Whether it enters the Bay as do the whitefish is unknown., Vladykov (1933) lists the habitat of this form in the James Bay region as fresh water.

Clupea harengus Linnaeus Common Herring
Clupea harengus Linnaeus Syst. Nat. Ed. X 1758 p 313 seas of Europe

Range: In General, the north Atlantic south to Massachusetts and Straits of Gibraltar. In our region, the herring was first reported from Greenland by Fabricius (1780). In recent years herring have been much more common along the west Greenland coast. Jensen (1939) reviews a changing climatic cycle in Greenland in recent decades and its profound effect on the ichthyofauna. He states that in 1909 herring occurred only in small schools in the Frederikshaab

district, but in 1937 there were large numbers in the region from Frederikshaab to Sukkertoppen. In August 1934 two large herring were taken at Proven in latitude 72½° north. In 1932 herring were found spawning in the Julianehaab district. The counting of vertebrae by Paul Hansen revealed that the herring belong to the summer spawning race of Iceland.[1]

The herring is an extremely common fish to the south, but its abundance in Greenland fluctuates with the climate. An increase as previously noted has been very apparent the past few decades.

Food: The herring is a plankton feeder, chiefly copepods, amphipods, pelagic shrimps, decapod larvae etc.

Reproduction: The eggs of the herring are demersal. They lie on the bottom where they become attached to rocks and bits of seaweed.

Economic importance: The herring is one of the most common fish in the north Atlantic and has enormous economic importance both directly and indirectly. It is caught in large numbers by man for food, and it is also preyed upon by many other important commercial fishes. The recent change in climate has enabled the setting up of a small but profitable herring fishery in Greenland.

Clupea pallasii Cuvier and Valenciennes California Herring
Clupea pallasii, Cuvier and Valenciennes, Hist. Nat Poiss.XX 1847 Kamchatka

Range: In general, the Pacific coast from California

1. Jensen Ad. S. Concerning a Change of Climate p 16

and Kamchatka north, entering the Arctic ocean to at least as far east as Cape Bathurst. In our Region, John Richardson[1] collected herring in Bathurst inlet on the 5th of August 1821. R. M. Anderson (1913) writes; "Great numbers come into Cape Bathurst sandspit during the latter part of August. Only occasional stragglers appear during the middle of the month. On August 3, 1911 we ran one end of a 200 foot sweep net out from the beach with a dory and drew in about 13 barrels of herring (about 3,000 fish). A very few Leucichthys lucidus were taken in this haul. ----------The Baille Island eskimos say that herring were never caught there before white man came (a little over twenty years ago. ---- The explanation seems to be that herring schools come in only periodically and not often close inshore, while the eskimo did not use long seines, confining their fishing operation to short gill nets along the beach."[2] The Royal Ontario Museum of Zoology contains six specimens. One taken August 24, 1937 at Tuktuyaktuk near Akalavik, N. W. T, and 5 taken Sept. 3, 1938 six miles north of Kidluit, N.W.T.

The California herring resembles the common Atlantic herring very closely, some authors recognize only a subspecific distinction. The habits of the two forms are very similar.

Economic importance: Great to the South. In our region its occurrence is of such a transitory nature that it has only a slight importance.

1. Richardson Fauna Boreali Americana p 231
2. Anderson Fishes in My Life with the Eskimo p 452

Oncorhynchus gorbuscha (Walbaum) Humpback salmon
Salmo gorbuscha Walbaum Artedi Pisc. 1792, 69 Kamchatka

Range: In general, the Pacific coast and rivers of North America straying north into the Arctic. In our region, Bean (1888) reported this form from the Collville River Arctic Alaska. Murdoch (1885) reported that this species occurred sparingly in the salt water at Point Barrow. J. R. Dymond (1940) reported on two specimens of humpback salmon taken at Kigtluidt on Richardson Island, Sept. 1936 and one at Kittigasiut Aug. 10, 1938. These specimens are deposited in the Royal Ontario Museum of Zoology.

This common Pacific salmon is here at the extreme limit of its range. The full extent of its occurrence is unknown, but reported specimens indicate that this form is quite rare.

Oncorhynchus keta (Walbaum) dog salmon
Salmo keta vel kayko Walbaum Artedi Pisc. 1792, 2, Rivers of Kamchatka.

Range: In general, the Pacific coast from San Francisco North straying into the Arctic, Borisov (1928) reported a dog salmon caught in September at the mouth of the Lena, which is about 2,000 miles west of Bering strait. In our region, Dymond (1940) reported this form from the Mackenzie River.

"On Sept. 20, 1938'Mr Lang wrote we got quite a few salmon fishing at the coast about thirty in all and I hear several more were caught over the Delta. According to Mr. Lang a notable run of dog salmon came up the Mackenzie

River as far as Arctic Red River and Peel River in 1914. Some of these salmon were very large from twenty to twenty-five pounds."[1] The Royal Ontario Museum of Zoology has specimens taken on August 26 & 28, 1938 at Whitefish Station near Akalavik, one from Peel River 50 miles south of Aklavik on October 4, 1937, and two from six miles north of Kigtluidt, Richardson Island, taken on Sept. 6 and 11. 1938 respectively.

Salmo salar Linnaeus Atlantic Salmon
Salmo salar Linnaeus Syst Nat Ed X, 1758, 308 Seas of Europe

Range: In general the North Atlantic ascending all suitable rivers in North Europe, and North America from Cape Cod north to Ungava and south west Greenland. In our region this form is known from Greenland and Ungava Bay.

Salmo salar is not common in Greenland waters. Fabricius (1780) reported this form from the Frederikshaab district. Jensen (1939) listed the place that the Atlantic salmon is known to occur in the Greenland Region as Kapesigdlit, Godthaab fjord Amerdlok fjord near Holsteinsborg, and Ikerasak. In 1935 a group was seen migrating at sea off the Sukkertoppen district. In 1935, 200 were caught off Ikerasak, Sukkertoppen district. Jensen (1939) mentions this fish as one that has benefitted by the recent climatic change in Greenland.

While the Atlantic salmon has long been known to occur in Ungava Bay the record has been queried because no specimens of that form existed in museums from that region.

1. Dymond, J.R. Pacific Salmon in the Arctic Ocean p 345

Early authors reporting this form were Bell (1884), Turner (1889) Low (1895) and others. Jordan and Evermann's statement in their Fishes of North and Middle America that this form occurs in Hudson Bay is in error.

The writer saw salmon (S. salar) which were taken in the Koksoak River near Fort Chimo, Ungava, and also specimens taken in the George River. Inquiries among the natives revealed that atlantic salmon are taken in all suitable rivers between the George and Koksoak Rivers. They occur only sparingly in Leaf River to the north of the Koksoak and none are ever taken in Payne River.

An interesting comment on the salmon of Ungava Bay is that the Eskimos use only the English name salmon for this form. L. M. Turner[1] states that the explanation given to him was that before white men came the eskimos had no nets, hence, they rarely caught the salmon. This lack of knowledge of the fish caused them to give it the name kavesilak, which is an appellation they now use for whitefish and means simply a fish with scales.

Food: The salmon is a voracious fish, it is entirely carnivorous feeding upon live bait, chiefly fish, but also crustaceans. When making the spawning run it feeds little or not at all. Stomachs seen by the writer at George River Hudson Bay post which is approximately twenty miles from the mouth of the river were empty. Turner[2] states that specimens examined by him contained

1. L. M. Turner 1885 Unpublished manuscript.
2. Ibid

fish Boreogadus saida and sculpins. As these form are marine, Turner's specimens must have been taken shortly after their entrance into the estuary of the River.

The salmon is an anadromus fish coming into fresh water to spawn. The length of time which the parr spend in fresh water varies from less than two years to eight years. The length of time which the parr spend in Ungava Bay region in fresh water is unknown, but investigation elsewhere indicate a much greater length of time in fresh water for the northern part of the salmon range, Blair (1943).

The data on the time of the spawning migrations up the Ungava region is meagre. Turner[1] states that the salmon arrive in the Koksoak on variable dates, but seldom before the 24th of July and on several occasions as late as the 20th of August. In 1882, salmon arrived on the 14th of August, the reason for the delay that year was contributed to the prevailing winds which kept the bay filled with ice. According to Turner, the Salmon run has two definite peaks. The earliest run being the greatest and is composed of larger fish than the second run which occurs later.

Economic importance: Great as a food fish. The salmon fishery is the only successful exploitation of a commercial fisheries in the Canadian Arctic territorial waters, and this lasted only a brief period. The Hudson

1. Turner L. M. unpublished manuscript.

Bay Company carried on a salmon fishery in the rivers of Ungava sporadically from 1881 to 1934, the fish were originally shipped to the London markets. A specially refrigerated ship the "Diana" of 55 tons capacity was charted by the Hudson Bay Company to carry on this trade from 1881 to 1884. After 1884 the company found that salting the fish was more profitable.

There is no published data on the statistics of the salmon catch in this region. Turner[1] states that the Salmon run from 9 to 45 pounds in the Koksoak region. The largest seen by Turner was a 44 pound specimen. The price obtained on the London market was 20 to 65 cents a pound. The following statistics are taken from Turner's unpublished manuscript.

Year	Aver. Wt. of Salmon	Tons
1881	19 lbs.	40
1882	16 lbs.	24
1883	14 lbs.	38
1884	14 2/3 lbs.	less than 40

A. P. Low (1895) wrote that the salmon catch averaged 100 tierces a year for export from the Koksoak River, 50 tierces from Whale River and 120 tierces from George Rive. In 1899, A.P. Low wrote that the salmon industry had steadily declined and in 1898 was almost a total failure.

Since that time the salmon fisheries have been sporadically revived, the last attempt of the Hudson Bay Company to fish the rivers commercially was in the early 1930's. The writer would estimate the native catch on the Koksoak in 1947 as 35 barrels. Salmon is now used almost exclusively as

1. Turner Loc. cit.

dog food except for the ones that are used by the natives for food during the short fishing season.

Salvelinus fontinalis (Mitchill) Brook trout
Salmo fontinalis Mitchill Trans. Lit. Phil. Soc. New York 1 1815, 435 near New York City.

Range: In general this fish ranges in fresh water from the Appalachian mountains in Georgia northward to Ungava Bay and James Bay. In our region, Valdykov records this fish from James Bay to 24 miles north of Great Whale River on the East coast of Hudson Bay. The writer obtained specimens of this form in the vicinity of Fort Chimo, Ungava Bay in 1948. This fish appears to be more common than the Arctic charr in the Koksoak district.

This fish is predominantly fresh water, but goes to the sea in the summer. Weed (1934) found that at Anataluk Bay near Nain, Labrador, that the brook trout was found in the sea from the time the ice first opened in early June until late in the summer. The food of the trout while in the sea in that district was chiefly Gammarus and the larvae of rock crabs.

Economic value, great as a food and sport fish.

Salvelinus alpinus (Linnaeus) Arctic charr
Salmo alpinus Linnaeus Syst Nat. Ed. X 1758

Range: In general the arctic coasts and streams of Europe and Asia south to the Gulf of St. Lawrence and British Columbia on the American coasts. In our region, nearly every author of a fauna list of any part of the Canadian Arctic or Greenland has included this form. Richardson,(1836), Ross,

Simpson and Rae have collectively mentioned this form from all parts of the Canadian Arctic coast. Bell, Bean, Wakeham, Low, Halkett, Hildebrand and Manning have reported this form from parts of Baffin Island. Sabine (1824) was first to record this form from Melville Island in the Parry Archipelago. Jensen (1910) recorded this form from Jones Sound. The farthest north record is a specimen reported by Gunther from Floeberg Beach, Ellesmere Island facing the polar sea in Latitude 82° 28' N. Numerous authors have recorded this form from nearly all places on the west coast of Greenland. Published reports would indicate the presence of this form in all parts of the Canadian Arctic archipelago with the possible exception of the Northern Parry islands which have not been explored ichthyologically.

There exists considerable confusion as to the taxonomic status of the charrs in the Canadian Arctic. This is to be expected due to the absence of collections in museums and the known variability of the charr in regard to color and habit, depending on habitat, fresh or salt, spawning or non-spawning fish, and age. The writer is not prepared at the present time to pass judgment on the validity of described species due to a lack of study specimens from many regions of the Arctic and especially from the type localities of described forms. Descriptions in literature are inadequate, and are often based on single specimens. The following species have been described from the Canadian Arctic or Greenland.

1. Salmo stagnalis Fabricius 1780 Fauna Groenlandica. The type locality are large lakes in the Frederikshaab district of Greenland. Many American authors including Jordan, Evermann and Clark do not recognize the presence of S. alpinus in American waters, stating that it is replaced by S. stagnalis.

2. Salmo rivalis Fabricius Fauna Groenlandica 1780 small streams of the Frederikshaab District. This form has long been considered as synonymous with S.stagnalis of Fabricius.

3. Salmo hearnii Richardson 1824 App. to Franklins First Journey, Bloody falls on the Coppermine River. The description of this form is inadequate.

4. Salmo rossii Richardson 1835 Salmones App. to Ross' 2nd Voyage. Regent inlet, Boothia Felix. Jordan Evermann and Clark recoghized this form as being distinct in their checklist, with a range from Boothia Felix to Greenland.

5. Salmo alipes Richardson App. Ross's 2nd Voyage 1835 Small lake in Boothia Felix discharging into Prince Regent Inlet. Jordan Evermann and Clark place this form in synonymy with S. rossii.

6. Salmo nitidus Richardson App. Ross. voy. 1835. This type specimen came from the same lake as S. alipes, so possibly the difference between the two is due to secondary sex characteristics.

7. Salmo naresi Gunther. Proc. Zool. Soc. Lond. 1877 Fresh water Lake near Discovery Bay, Ellesmere. This form was recognized as distinct by Jordan Evermann, and Clark(1930)

8. Salmo arcturus Gunther Proc. Zool. Soc. London, 1877 Floeberg Beach, and Victoria Lake of Arctic America, Ellesmere. This species was recognized as distinct in the 1930 checklist of Fishes of North and Middle America.

9. Salmo hoodi Richardson is not a charr but a lake trout Cristivomer namaycush.)

10. Salmo malma (Walbaum) described from Kamchatka has long been recognized as the appelation for the Arctic charr of Alaska.

The writer is inclined to place all the above names except S. hoodi into synonymy with S. alpinus until additional specimens are available, however, it will undoubtedly be found that there are racial and perhaps specific distinctions in the Arctic charr.

The arctic charr is typically an anadromous fish, although landlocked forms exist throughout the Arctic. Weed (1934) writes of the charr of Labrador that they are to be found in all the lower streams and ponds at some season of the year, but spend a larger portion of the year in the sea. Manning (1942) writes that the Charr of southern Baffin winter at the bottom of lakes, and whether they occur in the sea in the winter was undetermined by him. Vladykov (1933) stated that they occur in the coastal salt water of Hudson Bay but go up the streams to spawn.

The spawning time of this form is probably September to October. Turner in an unpublished manuscript writes that in the Fort Chimo region of Ungava Bay the fish

start to ascend the Koksoak on the 28th of July, rarely earlier, and occasionally later, the run lasting from 8 to 15 days., decreasing as it increased with only four days when the fish are abundant. Weed (1934) stated that at Nain, Labrador the fish start to ascend the streams in August, by October 18th he observed fish on their spawning beds nearly spent. The writer observed these fish as being abundant in the George River area in August presumably ascending the streams.

That the arctic charr also make a spring run to the sea is well known. In the Ungava Bay area according to native accounts given the author, the charr leave the rivers and lakes right after break up and feed along the coasts where they are taken in Gill nets by the natives.

The biology of the arctic charr is little known, in salt water it prefers fishes, Capelin and Ammodytes forming its main diet. In the Ungava Bay region it is reputed to feed chiefly on crustacea (Gammarus) and sculpins.

Economic importance: In the native economy this fish is probably the most important throughout the Canadian Arctic. It is fished for by the natives right after break-up and during the fall migration run when large numbers are taken. That it sometimes occurs in large numbers is evident by reports such as Ross (1835) that 3,378 individuals were taken in the mouth of a small river in Bothia Felix with a small seine, a total of 6 tons of fish. The only place this form is fished commercially is Greenland where several

hundred barrels a year are exported to Denmark. Conservation is important in regard to this fish due to its slow growth and congregation in small streams which can be easily blocked by a net. However, the native fisheries could easily be increased.

Stenodus leucichthys (Guldenstadt) Inconnu
Salmo leucichthys Guldenstadt Nov. Comm. Acad. Sc. Petropol. XVI 1771-2, 533.

Range: In general North west Territory, Alaska and Siberia west to the White Sea, with an isolated colony in the Caspian Sea. In our region, Richardson (1823) first reported this form from the Mackenzie River region. Anderson (1913) states that the inconnu is common in the Mackenzie River and Great Slave Lake, it is found in brackish and salt water as far west as Herschel Island and to the east of the Delta to Toker Point. Melville (1914) gives the eastern limit of the inconnu as Anderson River.

The inconnu is usually regarded as anadromous, wintering about the delta and entering the Mackenzie and tributaries for spawning (Dymond 1943)

Food: In freshwater consists chiefly of fish. Dymond (1943) reports Esox lucius, Pungitius pungitius, and Amphiodon alosoides as taken from 6 stomachs examined.

Economic value: Great as a food fish. It is used by the natives for food and dog food. A commercial fisheries has developed for this form in Great Slave Lake.

Leucichthys autumnalis (Pallas)
Salmo autumnalis Pallas Reise II, 1787, 705

Range: In general Northwestern coasts and streams

of North America, ranging into Siberia. In our region reported by Dymond (1943) from the Mackenzie Delta region. Dymond considers L. laurettae (Bean) to be a synonym of this form.

This fish is used for food and dog food by the natives in the Mackenzie River region.

Leucichthys sardinella (Valenciennes)
Coregonus sardinella Valenciennes, Hist. Nat Poiss XX, 1847, 517

Range: In general Siberia and Northern Alaska to the Mackenzie River. In our region reported from the Mackenzie River Delta region by Dymond (1943). Dymond reduces L. pusillus Bean to synonymy with this form.

Important as a food fish for the natives in that region.

Leucichthys artedi (Le Sueur) cisco
Coregonus artedi Le Sueur Journ. Acad Nat Sci. Phil I, 1818, 231 Lake Erie

Range: In general from the Great Lakes north to Hudson and Ungava Bay. Its distribution in the Northwest territory is not known due to the lack of specimens. From our region reported by Melvill 1915 from James Bay. Dymond, (1933) from the Churchill District. Kendall (1909) Northern Labrador. The writer obtained a small cisco tentatively identified as this species from a fresh water lake in the vicinity of Fort Chimo, Ungava.

In the James Bay region this fish is reputed to spend the summers in salt water. Melvill (1915) writes that great quantities of this coast wise fish are caught in

nets set haphazardly from the shore and left for the tide. Whether this fish also occurs in the salt water of Ungava Bay was not determined. The natives emphatically stated to the writer that no whitefish entered the sea although they were occasionally taken in brackish estuaries of the larger rivers.

Coregonus clupeaformis (Mitchill) common whitefish
Salmo clupeaformis Mitchill Amer. Month. Mag II, 1818, 321
Falls of St. Mary, northern extremity of Lake Huron.

Range: In general Great Lakes north to Ungava, Hudson Bay and Mackenzie River delta. In our region reported from Kittigasuit, N.W.T. by Dymond (1943), James Bay North to Churchill by Melvill and others. From Ungava Bay by Kendall in 1909; The writer obtained a number of specimens of this species from Ungava Bay region in fresh water in the winter of 1948.

Melvill (1915) reported "that the sea run whitefish in the James Bay area are said to occur in large runs in the estuaries of the rivers and along the coasts with the first open water in the spring. They apparently go back into deep water amongst the numerous islands as the season progresses and about the middle of August another movement toward the shore takes place and this increases as the spawning season (beginning of October) draws near. So far as is known they stay in the river until December when they return to sea, probably remaining in deep water until the following spring."

This fish has great economic importance as a food

fish, although in much of our region it does not make satisfactory growth.

Prosopium cylindraceum (Pallas)

Range: In general Northern North America and Asia, chiefly in fresh water, from the Yenisei River in Siberia to New Brunswick and Maine. In our region has been reported from brackish water in James Bay and near Churchill, Hudson Bay, Dymond (1933). L. M. Turner obtained a specimen of this species in the Koksoak river near Fort Chimo in 1883. This specimen is deposited in the U. S. National Museum.

This species is not common in the region under consideration and does not appear to make satisfactory growth to be of economic importance.

Mallotus villosus (Muller) Capelin
Clupea villosus Muller Prodr. Zool. Dan. 1777, 245, Greenland.

Range: In general Arctic America south to Cape Cod and British Colombia and East to Norway and White Sea. The Pacific capelin is recognized as specifically distinct by some authors. Sleggs (1933) states that the southern limit of the capelin coincides approximately with a mean annual temperature isotherm of 45°F. In our region they have been reported by a number of authors. Richardson (1823) reports large shoals appearing in Bathurst Inlet, N.W.T. in order to spawn. Murdoch (1885) reports large numbers running along the beach July 20-25, 1882 at Point Barrow, Alaska.

L. A. Learmouth, a former Hudson Bay Factor on King Williams Island writes in a letter to the Royal Ontario Museum of Zoology the capelin appear in immense numbers in the vicinity of Bellot Strait, about the beginning of August just before the ice is all gone. Pfaff (1937) reports capelin from Roes Welcome, Lyons Inlet on Foxe Basin, Coronation Gulf, and Bathurst Inlet. Vladykov (1933) in summing up the reported occurrences of capelin in Hudson Bay lists the relatively well collected areas around Churchill and Long's point in James Bay. Turner (1885) in his unpublished manuscript reports that capelin abound in myriads along the Labrador coast in May, June and July, but were not detected in Ungava Bay until a few years before his stay at Fort Chimo which began in 1882. On the 8th of August 1883 a school of several thousand individuals were observed by Turner four miles within the Koksoak River. This was the first appearance of Capelin in the southern part of the bay known to white or native. Dunbar obtained three young specimens of 55mm in a plankton net set in the tidal current near Tunulik in Ungava Bay in 1947. The capelin is extremely common along the east and west coasts of Greenland. Jensen (1939) reports that specimens have been taken as far north as Thule 76° 30' N. lat. in west Greenland.

Vladykov (1933) stated that spawning occurs in Hudson Bay in the last of June. The same date would be indicated for Ungava Bay by the size of planktonic young taken on August 29, 1947 by Dr. Dunbar. Capelin prefer

sandy beaches for spawning although they will spawn on rocky beaches. The species spawns in the warmest months of the year and on beaches where water temperatures will be highest. Gravel forms a protection to the eggs, because the churning action of the waves tends to bury the eggs out of the reach of their enemies, Sleggs (1934).

The appearance of capelin along the Newfoundland coast indicates the movement is from deep water to land (Sleggs 1934). The capelin are said to precede the cod in migration up the coast of Labrador, which would indicate a migration up from south to north. The capelin young obtained in Ungava Bay in 1947 would indicate the first winter being spent in that area.

Food: The capelin in Newfoundland waters feeds chiefly on euphausids and schizopods, (Sleggs 1934).

Economic importance: The capelin bulks large in the Greenland native economy. In localities where they occur in abundance they are dried and used as food both for man and his dogs. However the greatest economic importance is indirect, the capelin is an important food of commercial fishes such as the cod.

Osmerus dentex Steindachner smelt, Rainbow herring
Osmerus dentex Steindachner Sitz, Kais, Akad. Wiss. Wien LXVI, 1870, 429 Northern China

Range: In general the coasts of Alaska to Mackenzie and south on the Asiatic side to Northern China. In our region, Murdoch (1885) reported this smelt from

Wainwright Inlet, Alaska. Anderson (1913)reports that this species is rare along the Arctic Coast, one specimen was taken at Cape Bathurst, N.W.T. The Royal Ontario Museum of Zoology hastwo specimens, one taken July 15, 1937 from Kittigasuit, N.W.T. and one from Aklavik.

Nothing is known concerning spawning or food habits of this rare species in our region.

Nansenia groenlandica (Reinhardt)
Microstomus groenlandic Reinhardt Vid. Selsk Naturh, Afh. VIII, 1841, LXXIV Greenland.

Range: In general Deep water from Greenland to Nova Scotia. In our region, this form was originally described from Greenland by Reinhardt. This deepwater fish is not common.

Bathylagus benedicti Goode & Bean
Bathylagus bendicti Goode & Bean Oceanic Ichthyology. 1895 p 55 Gulf Stream.

Range: In general the gulf stream. In our region this fish has been reported from Davis Strait south of the submarine ridge in the deep "warm" water. Jensen (1926).

Stomias boa Risso
Stomias boa Risso Ichth. Nice 1810, p.330

Range: In general Atlantic and Mediteranean.. In our region this deep water fish was described from Greenland as S. ferox by Reinhardt in 1842. This form has been reported from a number of places south of the submarine ridge in the deep "warm" water of Davis strait (Jensen 1926) Lutken(1898) reported a specimen from Jacobshavn which is north of the

submarine ridge between Baffin and Greenland. This deep water form is not an uncommon inhabitant of the deep water of Davis Strait.

Cyclothone microdon (Gunther)
Gonostoma microdon Gunther Ann. Mag. Nat. Hist. II, 1878, 188 near Bermuda.

Range: In general this deep sea fish has been reported from all the oceans of the world. In our region this form has been taken in Davis Strait. Lutken (1898) reports this form from southwest of Godthaab in 582 fathoms of water and southwest of Sukkertoppen in 1435 fathoms of water. This form has also been reported from Baffin Bay.

Argyropelecus olfersi (Cuvier)
Sternoptyx olfersi Cuvier Regne Anim Ed. 2, 1829, 316 near Cape of Good Hope.

Range: In general the open Atlantic from Norway to Cape of Goode Hope and from Greenland south in the Gulf stream. This fish is included in the fauna of our region on the basis of its appearance in Jensen's 1926 list of the fishes of Greenland.

Notacanthus chemnitzi Bloch
Notacanthus chemnitzi Bloch Abh. Bohwischen Gesellsch. Wise, I, 1787, 278 Northern seas.

Range: In general, West Indies, Iceland, Scandinavia and South Greenland. In our region, this specimen is known from South Greenland. Fabricius received a specimen of this fish from Greenland on which he read a paper before the Copenhagen Natural History society in the 1790's. Reinhardt (1838).

Notacanthus rostratus Collett
Notacanthus rostratus Collett Bull. Soc. Zool France, 1889, 307, of Newfound at Albatross Station 2216 in 963 fathom.

Range: In general the Gulfstream. Danish Ingolf Expedition obtained a specimen of this form in Davis Strait (Lat 65° 16' N, 55°05' W.) in 1895 (Lutken 1898).

Anguilla bostoniensis (Le Sueur) American Eel
Muraena bostoniensis Le Sueur Journ Acad. Nat. Sci. Phila. 1817, 81 Boston

Range: In general the coast of America from the West Indies to South Greenland ascending suitable streams. In our region, this species is a rare form. Jensen (1938) lists six specimens sent from Greenland to Copenhagen from the area of the southwest Greenland Coast from Nanortalik north to 62° 18' N. Lat.

Synaphobranchus pinnatus (Gronow)
Muraena pinnata Gronow Cat. Fish 1854, 19 locality unknown

Range: In general the North Atlantic and Western Pacific. In our region this form has been taken in Davis Strait in the "warm" deep water south of the submarine ridge between Greenland and Baffin. Jensen (1926)

Histiobranchus infernalis Gill
Histiobranchus infernalis Gill Proc. U.S. Nat. Mus. VI, 1883 255 Gulf stream at Albatross station 2037.

Range: In general the Gulf stream. In our region Lutken (1898) reported a specimen from west Greenland Lat 61° 50' N at a depth of 1435 Fm. and one from 60° 17' N,L and 54° 05' Long W. Those are the only known occurrences of this deep sea form from our region.

Saccopharynx ampullaceus (Harwood)
Ophiognathus ampullaceus Harwood Phil. Trans. 1827, 52 Atlantic

Range: In general the Atlantic. The specimen

upon which the species was based was captured at the entrance of Davis Strait in Lat. 62° N and 57° w Long. It was discovered in a helpless condition almost worne-out by an unavailing effort to gorge a fish seven inches in circumference (Richardson 1836)

Paralepis coregonoides borealis Reinhardt
Paralepis borealis Reinhardt K.D. Vid. Selsk Nat. Math. Afh. VII 1838, p 115 & 125

Range: in general, the north Atlantic from 30°N to Greenland. Post larvae are known from the southern part of this range while only adults are known from the northern part of the range. Clupea encrasicholus of Fabricius 1780 has been considered synonymous with this form by Jensen. Jensen (1942) lists localities where this form has been taken from Cape Farewell to Umanak Fjord in Lat 72° N.

This fish is often taken from the stomachs of seal and fish or found alive on the surface of the water or dead along the beaches. This would indicate that they were carried into Greenland waters with the Gulf Stream where the cold water makes them sluggish. (Jensen 1942).

Paralepis risso kroyeri Lutken
Paralepis kroyeri Lutken Vid. Medd. Naturh. Foren Kbhvn, 1891 227

Range: In general the range of this fish parallels that of the preceding species, however the adults are much rarer in collections. In our region, Jensen (1942) lists its occurrence in West Greenland on the basis of 6 specimens; two from the Umanak fjord district and three from extreme southwest Greenland. The author obtained 6 badly damaged

specimens from Cod stomach (Gadus callarias) at Port Burwell. They were provisionally assigned to this species on the basis of vertebrae count.

The distribution of the post larvae of this species and the preceding one clearly shows that they are a migratory fish as Jensen has pointed out, probably following the Gulf Stream with its various ramifications, Irminger Current, North cape current and Norwegian Atlantic current "So strongly does the water gradually become cooled, that these fishes are paralyzed, many examples of which we have seen in the foregoing becoming an easy victim of seals and fishes of prey, or they float dying or dead up to the surface of the water and may drift ashore."[1] The list of the places where post larvae have been taken and the water temperatures clearly indicate that this genus cannot reproduce in the colder northern waters.

Lampanyctus elongatus (Costa)
Scopelus elongatus Costa Fauna D'regno di Napoli Pesc, Pt. 1 gen, Scopelus pa, 1844

Range: In general widespread in the Mediterranean, Atlantic and Pacific. In our region is known from two specimen taken at Godhavn, Greenland. Lutken (1892). This is not a common form and Lutken specimens were in poor condition which made him dubious about his identification.

Lampanyctus crocodilus (Risso)
Gastropelecus crocodilus Risso Ich. deNice, 1810, 357

Range: In general the Mediterranean and Atlantic.

1. Jensen Contributions to the Ichthyofauna of Greenland I-3 1942 p 19

In our region this species has been taken at a number of places in Davis strait south of the Submarine ridge (Jensen 1926). The writer took 19 specimens of a Lampanyctid from cod stomachs (Gadus callarias) at Port Burwell in the middle of Aug. 1947. The specimens were tentatively assigned to this species. This was one of the most common fish found in cod stomachs in that locality.

Myctophum arcticum Lutken
Scopelus arcticus Lutken Spolia Atlantica 1892, 29, Davis Strait

Range: In general North Atlantic and Arctic waters. In our region, this species was originally described from Davis Strait in 1892. Jensen (1926) reported that the "Dana" took specimens of this form south of the submarine ridge in Davis Strait; they are not known to occur north of the ridge.

Myctophum glacialis (Reinhardt)
Scopelus glacialis Reinhardt Overs. 1835, 36 Greenland

Range: In general this species is known from the Northern Atlantic and Arctic waters. In our region this species has the widest distribution of all the lantern fish, It has been reported both north and south of the submarine ridge in Davis strait. Jensen (1926) lists a specimen from 70° 41' N Lat. in Davis strait. The writer took a number of small specimens from cod stomachs at Port Burwell in 1947. They were in such a bad state that assignment to species was not attempted. A consideration of known geographic ranges would indicate this species.

Alepisaurus ferox Lowe Lancetfish
Alepisaurus ferox Lowe Trans. Zool Soc. Lon. I, 1833, 395 Maderia

Range: In general, the deep water of the Atlantic north to Davis strait. Lutken (1898) listed localities of Godthaab, Sukkertoppen, Frederikshaab, and Jacobshavn for this small deepsea fish.

Coryphaenoides rupestris Gunner
Coryphaenoides rupestri Gunner Trond. Selsk Skrif. III, 1765, 50

Range: In general the Banks of Norway west to Iceland and Greenland. In our region this form was first reported from south Greenland by Fabricius (1780). The natives fish for it with a long line, the flesh being much prized by the Greenlanders. (Richardson 1836) (Jensen 1926) report 262 specimens of this species taken in Davis strait in Lat. 66° 37' N and 56° 37' W at a depth of 450 meters.

Macrourus berglax Lacepede Rattail grenadier
Macrourus berglax Lacepede Hist Nat. Poiss. III, 1802, 170 Greenland.

Range: In general from Massachusetts to Greenland and Norway. This fish has been recorded from Davis strait on both sides of the submarine ridge by Jensen (1926) under the name M. fabricii. It is most common Macrourid in the deep water of Davis strait.

This deep water fish feeds on small fish and crustacea.

Macrourus aequalis (Gunther)
Corphaenoides aequalis Gunther Ann. Mag. Nat. Hist 1878, (5) II, 25

Range: In general deep water Maderia to Greenland.

This species is included in our report on the basis of Jensen (1926) including this form in his list of the fishes of Greenland.

Macrourus goodei Gunther
Macrourus goodei Gunther Challenger Rept XXII, 1883, 196

Range: In general, deep water of North Atlantic. Lutken (1898) recorded two specimens from Davis strait (61° 50' N.L. 56° 21' W Long and 60° 17' N - 54° 05' W)

Gaidropsarus ensis (Reinhardt)
Motella ensis Reinhardt D. Vid Selsk Afh. VII, 1838, 116,128, Greenland.

Range: In general from Greenland to New York. In our region described in 1836 from two specimens taken from a seal (Cystophora) at Umanak (lat. 70° North). The Albatross obtained specimen at depths of 858 fathoms to 1081 (Goode & Bean 1895), in the north Atlantic

Gaidropsarus septentrionalis (Collett)
Motella septentrionalis Collett Ann. Mag. Nat. Hist. 4,15, 1875, 82 Lofoton

Range: In general the coast of Norway to Greenland, in our region reported from Greenland by Lutken (1881).

Ciliata argentata (Reinhardt)
Motella argentata Reinhardt D. Vid. Selsk. Afh. 1838, 116, 128 Greenland.

Range: In general coasts of Greenland to Faroes and Bear Island. In our region this species has been reported from Davis Strait from whence it was described by Reinhardt in 1838. Jensen (1936) reports this form from both sides of the submarine ridge in Davis Strait.

Boreogadus saida (Lepechin)
Gadus saida Lepechin Nov. Comm Acad. Sci. Petro. XVIII, 1774

Range: In general the Arctic seas. In our region Boreogadus has been reported from nearly all parts of the Canadian Arctic. Ellesmere Land, (Gunther 1877); Jones Sound (Jensen 1910); Northumberland Sound and Southhampton Island (Richardson 1854 & 1836 respectively,);Prince Regent Inlet, Gulf of Boothia (James Ross 1835); Fury and Hecla Straits, Eclipse Sound, Baffin and King William Land (Pfaff 1937); Lyon Inlet, Melville Peninsula, (Hildebrand 1939); widespread in Hudson and James Bay (Vladykov 1933); Herschel Island, N.W.T. (Scofield 1898). A number of specimens were taken from cod stomachs (Gadus callarias) by the writer at Port Burwell, Ungava in 1947. Numerous writers since Fabricius (1780) have reported this form from numerous localities along the entire west Greenland coast.

This fish is a pelagic salt water form from the surface to 160 meters. Murdoch (1885) states that this form is abundant at most seasons of the year near Point Barrow Alaska. And that in the latter part of October when the sea has closed in the natives catch a good many of them at the very edge of the beach in about a foot of water.

Richardson (1854) wrote that the polar cod when hotly pursued by the beluga or white whale has been observed in its endeavor to escape to leap by the hundred on the ice. The members of the Belcher expedition took advantage of this circumstance and also by it being left in rocky pools by the

receding tide to obtain several excellent meals.

Scofield (1898) obtained this species by the use of a seine in very shallow water at Herschel Island. He reports that the fish was very abundant at the surface among the ice floes. This habit of appearing at the surface among the ice floes is also noted by Turner in Ungava Bay in his unpublished manuscript of 1885.

Food consists chiefly of crustacea.

Economic value is only slight as a food fish for the native population.

Boreogadus agilis (Reinhardt)
Gadus agilis Reinhardt D. Vid. Selsk. Afh. VII, 1838, 126, Greenland. Northern Bays of Greenland

Range: The northern Bays of Greenland.

This species has not been recognized for a number of years until revived as a valid name by Svetidov (1935). Svetidov states that Reinhardt species was based upon specimens belonging to both saida and agilis.

Boreogadus saida varies greatly within the species and until specimens are available to delimit this variability, it will not be possible to delimit the species of this genus with certainity.

Arctogadus pearyi (Nicols and Maxwell)
Boreogadus pearyi Nichols and Maxwell Copeia 1933 No 1 p26 Lincoln Bay Greenland.

Range: This species has been recognized only from the type locality. Schultz and Welander (1935) refer this species to Arctogadus because of the presence of a row of well spaced unequal teeth on the vomer and on the palatines.

Arctogadus borisovi is known from northeastern Siberia, so when additional collecting is done the genus may be found to be present all across the Canadian Arctic.

Pollachius virens (Linnaeus)
Gadus virens Linnaeus Syst Nat Ed X 1758, 253, oceans of Europe

Range: In general the north Atlantic, common northward along both coasts, ranging southward to Cape Cod on the American coast. Jensen (1939) in discussing the change of fish fauna due to a recent amelioration in the climate in Greenland states that this fish has appeared in greater numbers in recent years. He lists the districts of Julianehaab, Godthaab, Sukkertoppen and Holsteinborg as places where this fish has been taken. At Arsuk in the south Frederikshaab district large shoals of two year old coal fish were seen near the coast in 1930 and 1932.

While an important commercial fish to the south its occurrence in our region is too rare and sporadic for commercial development.

Eleginus gracilis (Tilesius) Tom Cod.
Gadus gracilis Tilesius Mem. Acad. Sci. Imp. St. Peters. II 1810 354 Kamchatka.

Range: In general the North Pacific entering the arctic ocean to the Mackenzie Region. In our region the exact status of this species is unknown, it has been confused with Microgadus proximus and with Eleginus navaga, which Shultz and Welander (1935) recognized as a distinct species.

In our region, a species of this genus, listed as navaga was reported by Pfaff (1937) from Simpson Strait there is a specimen in the Royal Ontario Museum of Zoology

collected by K.H. Lang at Kidluit near Aklavik, N.W.T. on August 31, 1938. Anderson (1913) in reporting on their occurrence in the Northwest Territories states that tomcod are abundant at certain spots in the eastern end of Langton Bay and are very easily hooked through the ice all winter long. He also states that they are common at certain places in Coronation Gulf.

This species has considerable value as a food fish, but the extent of its occurrence in the Arctic is unknown.

Gadus callarias Linnaeus Common Atlantic cod
Gadus callarias Linnaeus Syst Nat ed X, 1758 252 Baltic sea and oceans off Europe.

Range: In general both sides of the North Atlantic north to Greenland and south to Cape Hatteras on the American coast. In our region, it has been reported by numerous authors since Fabricius (1780) in the Greenland region Jensen (1938) reported that it occurs all along the west Greenland coast to Upernavik at Lat. $72\frac{3}{4}^{\circ}$ N. where a few isolated individuals have been taken. The cod has been recorded from Port Burwell by Vladykov (1933). The author found cod abundant at Port Burwell in August of 1947. The Chicago Museum of Natural History has two specimens collected at Griffin Bay on the south shore of Frobisher Bay on August 14, 1927. The specimens were identified by Dr. A. Weed, who was familiar with the northern fishes.

The cod is a migratory fish following the fish upon which it feeds. Its migrations have not been critically studied in our region except in west Greenland.

Robert Bell[1] writes concerning its migration in the Ungava Bay area. "During our stay August 5-8, the water teamed with fine cod, which were taken in numbers by jigging. On our return to Port Burwell on the 27th and 28th of September the fish were still abundant. From all I could learn by enquiries along the Labrador coast and from our crew, it would appear that though the date varies in different places, the average time for the cod to strike the shores is in the middle of July and the particular time at any locality depends more on the presence or absence of ice than on latitude."

Low[2] states "Fishing beyond Cape Chidley along the east coast of Ungava Bay was not undertaken until 1893, when a Newfoundland steamer was so successful that in 1894 two steamers and three schooners made successful catches in the neighborhood of Port Burwell. The eskimos report cod as abundant at George River in the month of August."

The cod appearance seems to fluctuate at Port Burwell. Turner (1886) in his unpublished manuscripts states that in the early 1880's the cod was extending its range northward. Dr. Dunbar and the writer found cod abundant at Port Burwell in 1947 in shallow water of 10 to 30 meters. However no commercial fisheries have been carried out at Burwell for a number of years.

The appearance of cod in West Greenland have fluctuated greatly between periods of extreme abundance

1. Robert Bell Observ. on Geol. Miner. Zool. & Botany of Labrador Coast, Hudson Strait and Bay p 20
2. A.P. Low Report on Exploration of Labrador Peninsula p 337

and periods of scarcity. 1820 to 1840 was one period of abundance during which a commercial fishery was carried on, but by 1850 cod had become so scarce that the fishery was abandoned (Jensen 1939). Jensen in discussing a recent amelioration of climate in the west Greenland traced the yearly change in the northward movement of the cod in west Greenland waters as a fauna manifestation of this change in temperature. In 1909 cod were very rare in Greenland, and were found in only a few places. In 1917 they appeared in abundance at Julianehaab and Godthaab fjord, by 1922 they had reached Sukkertoppen; by 1929 everywhere in the Egedesminde district; 1931 they had reached Umanak district, and in recent years a few isolated individuals have reached Upernavik in Lat 72¾° north.[1] The cod arrive later as the latitude north is increased. In 1932, cod arrived at Egedesminde in the middle of July, at Ritenbank on August 24, and at Umanak at the beginning of September.[2] The same cycle can be traced for the east coast of Greenland.

The cod regularly spawns in Greenlandic waters. The "Dana" investigation of west Greenland waters in 1925 obtained pelagic cod eggs on the banks in Davis strait from June 6 to 23 between latitude 63° 15' to 66° 45' north.

1. Jensen Concerning a recent changeof Climate p5
2. Jensen loc. cit p 6.

Food: The cod is a very voracious feeder, feeding on anything which is available. The writer examined about 220 cod stomachs in the vicinity of Port Burwell, and found both vertebrate and invertebrate remains present. Present in all cod stomachs were sea butterflies (Limacina) which were especially abundant in the water at that time. All bottom crustacea were eaten including shrimps, crabs, amphipods etc. The vertebrate remains consisted of a large number of species. Especially abundant were lanternfish (Lanpanyctus and Myctophun), small Greenland halibut (Reinhardtius), and sea snails (Liparis), in lesser numbers Boreogadus, Sebastes, Lycodes, Lumpenus, Paralepis, Eumesogrammus, Gymnelis and Triglops were taken from cod stomachs.

The codfish is a very important economic fish in the area where they occur. To show how the amelioration of climate has affected the Greenland economy the following statistics from Jensen (1939) are given.

1911-1916	18-125 tons
1917-1925	250-1000 tons
1926-1929	2000-5600 tons
1930-	8160 tons

The catch between the year 1930 to 1938 has oscillated between 6125 tons to 8000 tons.

Gadus ogac Richardson Greenland cod.
Gadus ogac Richardson Fauna Bor. Amer. III, 1836, 246, Greenland.

Range: In general, Greenland, Arctic coast of America south to the Gulf of St. Lawrence. In our region, Vladykov (1933) listed the following places in Hudson Bay

and Strait, Old Factory Bay, Cape Jones, Cape Merry, Fort Churchill, off Great Whale River and Port Burwell. The writer took no specimens of this form in Ungava Bay in 1947, although, Turner in his unpublished manuscript reported seeing specimens from George River and a report of one being caught off the Koksoak in the 1880's. L. A. Learmouth, a Hudson Bay factor reported in a letter to the Royal Ontario Museum of Zoology that a species of rock cod is taken full of spawn at the end of March and is abundant in the inlets off the east shore of Adelaide Peninsula, Cambridge and Wellinton Bay on south Victoria Island and Kent Peninsula and is taken as far west as the Mackenzie. Pfaff(1937) reported a specimen from Simpson strait. Ross (1835) obtained a species of rock cod from Prince Regent Inlet. The Ottawa Museum has a specimen taken in Bathurst Inlet in 1916 by the Canadian Arctic Expedition of 1914-18. Jensen (1939) states that the recent amelioration of climate has affected this fish, and it has become rarer in the south part of its range. It ranges north to 74° north latitude on the west Greenland coast.

The biology of this fish has not been critically studied. It is usually taken in the coastal salt water over rocky grounds. The food habits appear to be the same as Gadus callarias. Vladykov (1933) reports the food of two specimens taken in James Bay consisted of fish and amphipods.

Different from the Atlantic cod, this form spawns early in the year usually in March.

The economic importance of this fish is chiefly as a food fish for the native population.

Melanogrammus aeglefinus (Linnaeus) Haddock
Gadus aeglefinus Linnaeus Syst Nat ed. X, 1758, 251, oceans off Europe

Range: In general the north Atlantic on both coasts. In our region this is a rare fish, which was taken from west Greenland for the first time in 1929. Jensen (1939) listed the following occurrences, Sydproven, in the south district of Julianehaab in 1929, Sukkertoppen district, 1931, and Holsteinsborg in 1937.

This fish is predominantly a southern form, in recent years a few have entered Davis Strait due to a hydrographic change, but not in enough numbers to be of economic importance.

Molva molva (Linnaeus)
Gadus molva Linnaeus Syst Nat. ed 10, 1758, 254, seas of Europe.

Range: In general Spitzbergen to Gulf of Gascony, Iceland and straying to Greenland. In our region this form was first recorded by Fabricius in the Frederikshaab district of Greenland in 1780. Jensen (1939) reported a specimen taken at Narssalik in Frederikshaab district in Sept. 1928.

This is a very rare form in our district.

Brosmius brosme (Muller) Cusk
Gadus brosme Muller Prodr Zool. Dan. 1776, 41, Denmark.

Range: In general, the North Atlantic south to

Cape Cod. In our region this form is known only from west Greenland. Jensen (1939) recorded a specimen taken in July 1936 in Ikertok Fjord in the district of Holsteinsborg. Although first recorded by Fabricius (1780), records available would indicate that this form is merely a stray in West Greenland waters.

Trachipterus arcticus (Brunnich) Deal fish
Gymnogaster arcticus Brunnich Nya Handl. D. Vid. Selsk Skr. III 1788, 408

Range: In general, North Atlantic, Greenland to Norway. In our region this form has been reported only from west Greenland. The following records of this deep water form found washed up on beaches in Greenland are listed by Jensen (1939), Frederikshaab district, Julianehaab and Sukkertoppen districts. Jensen (1939) wrote that the increased occurrences of these specimens in recent years was another manifestation of the recent climatic and hydrographic change in west Greenland.

Lampris guttatus (Brunnich)
Zeus guttatus Brunnich D. Skr. III 1788, 403, Elsinore Denmark

Range: In general the open seas of the Atlantic and Pacific. Included in this report on the basis of its inclusion in Jensen's (1926) list of the fishes of Greenland.

Reinhardtius hippoglossoides (Walbaum)
Pleuronected hippoglossoides Walbaum Artedi Pisc. 1792, 115 based on Fabricius

Range: In general, Arctic parts of the Atlantic south to Norway and the Grand Banks. In our region this form has been reported from West Greenland. Jensen (1935)

summarised the reported occurrences in west Greenland as follows, the bays and fjords of west Greenland and out in the strait to Umanak in the north. The writer took 29 specimens of this species from codfish stomach (Gadus callarias) at Port Burwell, Ungava Bay, in 1947. They ranged in length from three to four inches. This was the most abundant fish remains in the codfish stomachs.

Jensen (1935) states that Reinhardtius spawns not in the bays and fjords where the adults occur, but out in Davis Strait over the deep water from 62° 53' to 66° 45' north latitude at depths of 680 to 1660 meters. The young are bathypelagic. The submarine ridge forms the northern boundary of the spawning area.

Food: Jensen (1935) lists capelin (Mallotus villosus) arctic pollach (Boreogadus saida), rose fish (Sebastes marinus) and crustacea (Pandalus borealis) and cephalopods (ten armed squids) as the principle food in the Davis Strait area of the adults.

Economic importance: This is a very important fish in the native economy in Greenland. 2,000 to 3,000 barrels are exported each year to Denmark.

Hippoglossus hippoglossus (Linnaeus) Halibut
Pleuronectes hippoglossus Linnaeus Syst nat ed. X, 1758, 269 European Ocean.

Range: In general, the north Atlantic from Greenland and Spitzbergen south to the Cape Cod and the Bay of Biscay, and the North Pacific to California. In our region this form is known only from the west coast of Greenland.

Jensen (1939) states that formerly the northern limits of this species was at the north edge of Store Hellefiske Bank, but in recent years it has been fished as far north as Umanak and a few isolated individuals have been taken in the Upernavik district in latitude 73½° north.

In the spring the halibut keeps to the deep and continually "warm" water off Store Hellefiske Bank, later in the summer when the temperature has risen it moves to the banks.

Economic value: Great as a food fish. The commercial fishery in Greenland is quite small.

Hippoglossoides platessoides (Fabricius) Sand dab
Pleuronectes platessoides Fabricius Fauna Groen. 1780. 164, Greenland

Range: In general, the North Atlantic from Greenland to Cape Cod and west to the coasts of England and Scandinavia. In our region reported only from the west coast of Greenland. Jensen (1926) defined its occurrence in Greenland as 61° 47' N to 69° 10' north. This species was taken in Umanak Fjord by Vanhoffen (1897).

Pelagic eggs of this species were found from the same area as listed above by the "Dana" in 1925 (Jensen 1926).

This species is not taken in very large numbers by the native Greenlanders.

Platichthys stellatus (Pallas) California flounder
Pleuronectes stellatus Pallas Zoogr. Ross. Asiatica III 1811, 416 Kamchatka, Aleutian and Kurile Islands

Range: In general, the Pacific coast of America

from Point Conception to Arctic Ocean and south to Sakhalin on the Asiatic side. In our region, Anderson (1913) wrote that flounder were taken occasionally in his nets at Langton Bay, N.W.T. Norman (1934) reported a specimen in the British museum from the Haslar Collection labeled Coronation Gulf, Bering Straits, which is obviously an error. Richardson (1836) reported this species at mouths of rivers running into the Arctic sea, giving the Coppermine as the only definite locality. Angus Gavin, Hudson Bay Company employee, reported in a letter to the Royal Ontario Museum of Zoology that two flounders occur in the Queen Maude Sea, from the description, the rough backed form must belong to this species. Royal Ontario Museum of Zoology has a specimen collected at Kittigasiut, N.W.T.

Lippsetta glacialis (Pallas) Arctic flounder
Pleuronectes glacialis Pallas Itin. III app. 1776, 706 mouth of the Ob.

Range: in general the Arctic coast of Russia, Siberia, America and south to St. Michaels Alaska, entering fresh water.

In our region Richardson (1836) listed a specimen from Bathurst Inlet, Northwest Territory. The Ottawa Museum has a specimen collected by the Canadian Arctic Expedition of 1914-18 at Bernard Harbour, N.W.T. Pleuronectes franklini which is now placed in synonymy with this form is based on types from Arctic America collected by John Rae. Angus Gavin in replying to a questionaire sent out by the Royal Ontario Museum of Zoology describes two different

species of flatfish from Queen Maude Sea, one of which probably is identical with this species.

This flatfish is too small and too rare to have economic importance in our region. The flesh is not highly valued by the natives.

Glyptocephalus cynoglossus (linnaeus) Gray sole
Pleuronectes cynoglossus Linnaeus Syst Nat ed. X, 1758, 269

Range: In general, the North Atlantic southward to Cape Cod and the Bay of Biscay. In our region taken in Davis Strait south of the submarine ridge. Jensen (1926) listed two specimens obtained in latitude 66° 37' N and 56° 37' Long in 450 meters of water.

This is the rarest of the flatfish occurring in Davis Strait.

Gasterosteus aculeatus Linnaeus three spined stickleback
Gasterosteus aculeatus Linnaeus Syst Nat. Ed. X, 1758, 489 Europe.

Range: In general, circumpolar in Arctic and subarctic regions. In our region this form is abundant in many of the streams of the Arctic. Specimens of this form were taken in the Koksoak River, Ungava (Kendall 1909) The Royal Ontario Museum of Zoology possesses specimens taken at Lake Harbour and Pond Inlet on Baffin Island. Richardson (1854) reported a specimen taken at Northumberland Sound on the Northwest Coast of Devon Island in deep water at a distance from any fresh water. In Greenland this form has been listed as far north as Umanak along the West Coast. VanHoffen (1897). This stickleback is more tolerant of

sea water than Pungitius pungitius, and is the only stickleback occurring in Greenland. Vladykov (1933) reported this form from Hudson and James Bay.

Pungitius pungitius (Linnaeus)
Gasterosteus pungitius Linnaeus Syst Nat. ed. X, 1758, 296 Europe

Range: In general, Arctic North America and Eurasia, ranging south to New York in America. In our region this form is predominantly an inhabitant of small streams and brackish estuaries. The writer found this species extremely common in small brackish water streams throughout Ungava Bay. One specimen was taken in a plankton net set in the tidal current near the mouth of Tunulik River in Ungava. Pfaff (1937) reported this form from Chesterfield Inlet and Baker Lake, Hudson Bay region. Hildebrand (1939) reports this form from Fox Channel. Vladykov (1933) reported this form as being common in the Hudson and James Bay region. The National Museum of Canada contains a number of specimens obtained near Bernard Harbour in the Northwest Territory. Royal Ontario Museum has specimens collected at a number of localities on Baffin Island.

This fish has no economic value because of its very small size, but it is an important source of food for the Arctic charr.

This is a very variable fish, dorsal spines on fifteen specimens collected by the author in Ungava Bay varied between eight and eleven. The subspecies brachypoda

described from Cumberland Gulf by Bean (1879) does not appear to be valid judging from material which the writer has examined.

Sebastes marinus (Linnaeus) rosefish
Perca marina Linnaeus Syst Nat Ed X, 1758, 290 Norway

Range: In general the north Atlantic, on the American coasts ranging from Greenland to New Jersey in deep water. In our region, Jensen (1939) states that this form ranges from the most southern point of west Greenland to 71° north, both in the fjords, along the coast and out in Davis Straits. The writer obtained two specimens of this form 2½ inches long from cod stomachs (Gadus callarias) at Port Burwell in August of 1947.

This fish is a deep water form as an adult. Jensen (1922) states that the depths it may be met with in Davis Strait are 30 to 470 fathoms. It inhabits chiefly the deep "warm" water of the straits. Many fish in winter are often found dead at the surface probably indicative of a hydrographic disturbance.

This form is viviparous, pelagic young of this species was taken by the "Dana" at numerous places between 61° 47' to 66° 30' north latitude over the banks and the deep water of Davis Strait.

Food: The food consists of small fish and crustacea. Jensen (1922) listed Mallotus villosus, Pandalus borealis as the main items of food in Davis Strait.

Economic importance: This fish is important as a commercial fish in Greenland. The natives catch this fish

at all seasons of the year. Many are caught through the ice.

Artediellus uncinatus (Reinhardt)
Cottus uncinatus Reinhardt K. Dansk. Vid. Selsk. Natur Math. Afh. VI, 1833, XLIV, 1837, Greenland

Range: In general, deep water from Greenland to Newfoundland. In our region has been reported from the Greenland west coast from which it was described. Hossten (1919) reported a specimen from Inglefield Gulf. The National Museum of Canada has two small specimens collected in Dolphin and Union Strait west of Cockburn point in 10 to 15 fathoms of water on Sept. 14, 1915 by Fritz Johansen.

This deep water form which commonly inhabits depths from 100 to 400 meters (Hofsten 1919) has an immense area between Greenland and Dolphin and Union Strait where it is unknown. More collecting may reveal its presence in this region.

Icelus bicornis (Reinhardt)
Cottus bicornis Reinhardt, Vid Selsk Naturh og Math Afh VIII, 1841, LXXV, Greenland.

Range: In general, circumpolar, on the American east coast south to Cape Cod. In our region this is not an uncommon species. Jensen (1910) reports this form from Jones Sound in 8 to 36 fathoms; Gunther (1877) from Franklin Pierce Bay and Discovery Bay, Ellesmere, Fowler (1914) reports this form from Foulke Fjord, Ulrik Bay and Granville Bay in northwestern Greenland, Pfaff (1937) from Chesterfield Inlet, Hudson Bay, Hildebrand (1939) from Fox Basin, Vladykov (1933) from several stations in Hudson Bay. The U. S. National Museum at Washington D. C.

has a larva of this form collected at Dundas Harbour, Devon Island in August, 1946. The National Museum of Canada contains three specimens collected in Dolphin and Union Strait off Cockburn Point by Fritz Johansen during the Canadian Arctic Expedition of 1914-18.

The vertical distribution of this sculpin is given as 4 to 280 meters (Hofsten 1919).

Triglops pingeli Reinhardt
Triglops pingeli Reinhardt Vid. Selsk. Natur., V, 1832, LII, Greenland

Range: In general, Greenland and Canadian Arctic, also present in Alaska and Kara Sea. Additional collections may prove this form to be circumpolar. In our region, Gunther (1877) recorded this form from Arctic Ellesmere Island, Jensen (1910) from Jones Sound, Dunbar (1947) Lake Harbour, Baffin. The National Museum of Canada contains specimens taken in Dolphin and Union Strait by Fritz Johansen. Vladykov (1933) recognizes three specimens from Hudson Bay as belonging to the Pacific subspecies beani.

Of this species' occurrence in Greenland, Jensen[1] writes "on the west coast of Greenland T. pingeli has been taken from 60° to 77° north both in the fjords, on the coast and at sea at depths from 15m to 500m, a single time even at 930m depth. When the bottom temperatures were registered they ruled between -1.35 and 4°C."

Jensen recognizes two subspecies from Greenland. T. pingeli pingeli with a distribution of northwest Greenland,

1. Jensen Skr.Uni.Zool.Mus. Kbhvn IV,1944 p 11

Southwest Greenland and east Greenland.

T. pingeli pietschmanni with a distribution of central west Greenland from Frederikshaab to Godthaab.

Vladykov recognizes T. pingeli beani (Gilbert) which would thus have a distribution from Puget Sound to the Arctic and east to Hudson Bay.

The writer obtained specimens of this species from cod stomachs at Port Burwell in 1947. Also seven larval forms were taken in plankton nets. This material was not adequate to identify subspecifically.

Triglops nybelini Jensen
Triglops nybelini Jensen Skr. Uni. Zool. Mus. Kbhvn IV, 1944, 24 Greenland

Range: In general, West Greenland, East Greenland and Jan Mayen. Jensen (1944) gives Amerdlok Fjord near Holsteinsborg and Spraglede Bay near Umanak, also various places in Davis Strait and Baffin Bay from 69° 30'N to 78° 14' north.

Jensen states that T. nybelini generally lives in deeper water (200 to 930m in west Greenland) than T. pingeli, and also T. nybelini appears from distribution to be a high Arctic species.

Myoxocephalus scorpius (Linnaeus) common sculpin
Cottus scorpius Linnaeus Syst Nat ed. X, 1758, 265 Atlantic ocean off Europe.

Range: In general, the Arctic and Atlantic oceans south of the American coasts to New England. In our region this common littoral sculpin has been recorded from numerous localities. Along the west Greenland coast it has been

recorded from Cape Farewell to the Thule District.[1] It has been recorded from Jones Sound (Jensen 1910); Northumberland Sound in 9 fathoms of water (Richardson 1855); Cumberland Gulf, Baffin (Bean 1879); Pond Inlet, Frobisher Bay, Baffin, Cobourg Island, Lyon Inlet, Melville Peninsula (Hildebrand 1939); Lake Harbour, Baffin (Dunbar 1947); Eclipse Sound, Baffin and Roes Welcome, Hudson Bay (Pfaff 1937). The Ottawa Museum has several specimens of this form collected by Fritz Johansen at Bernard Harbour, N.W.T. Vladykov(1933) reported this species as being common in Hudson Bay.

The status of M. Groenlandicus is still in doubt, although a number of authors including Pfaff, Jensen and Pietschmann conclude that it is not specifically distinct from M. scorpius of Europe.

The writer found this form very common in Ungava Bay. It is extremely common in the shore zone rarely taken at depths greater than thirty meters. This fish would move in toward shore with the tide, and only small specimens would be left in tide pools where they could be picked up by turning over the rocks under which they were hiding. The small ones seemed quite sluggish and could easily be picked up by hand. The color varies from almost black to a dark olive green on the back, the sides splotched with yellow or brown which blends very well with the laminaria and sand bottom.

This fish is very voracious, feeding on anything which comes within the gape of its wide mouth. In Ungava

1. Greenland Vol I Kbhvn

Bay the fish were found to be feeding almost exclusively on Gammarus which occurred so abundantly along the shore. At Port Burwell in the last part of August specimens were taken that were feeding almost exclusively on Pteropods (Limacina)

This fish spawns in December and January under the ice. The eggs are attached to sea weeds. Pelagic young of this form were taken in plankton nets in nearly all parts of Ungava Bay in 1947.

This fish has only slight economic value as food for the native population. They value the flesh quite highly.

Myoxocephalus scorpiodes (Fabricius)
Cottus scorpiodes Fabricius Fauna Groenl. 1780, 157 Greenland

Range: In general the Arctic region of America and Greenland. In our region this form has been reported at a number of places along the west coast of Greenland since its description from that region by Fabricius. The northmost record is Etah, Greenland (Nichols 1918). Vladykov (1933) reported this form from a number of stations in Hudson Bay and James Bay. Bean (1879) recorded this form from Cumberland Gulf, Baffin Island. Pfaff (1937) reported this form from Chesterfield Inlet and Roe's Welcome. Gunther, (1860) reported this form from Port Leopold in Prince Regent Inlet. Two specimens are in the National Museum of Canada collected by Fritz Johansen at Bernard Harbour, N.W.T.

This species was found quite common at a number of

localities in Ungava Bay by the writer in 1947. Numerous specimens were taken under rocks in tidal pools. None were taken by jigging as were M. scorpius. This form is said to prefer estuaries and the entrance sites of small fresh water streams into the sea.

Porocottus polaris (Sabine)
Cottus polaris (Sabine) App. Parrys First Voyage CCXIV, 1824 North Georgia.

Range: This small inadequately described cottoid is known only from the type locality on Melville Island and the West Coast of Prince Regent Inlet were it was taken by Ross (1835). The writer follows Jordan, Evermann and Clark, Checklist of Fishes of North and Middle America (1930) in recognizing this form as distinct. However, when more adequately known this form may be placed in synomymy with one of the two species of Myoxocephalus occurring in the Arctic.

Sabine (1824) writes of its habits as follows: "A species of cottus similar in habit to C. gobio was very abundant on the shores of North Georgia inhabiting pools of water left by the tide, and the mouths of small rivulets by which the snow on melting found its way to the sea."

Oncocottus quadricornis (Linnaeus) fourhorned sculpin
Cottus quadricornis Linnaeus Syst. Nat. ed. X, 1758, 264, Baltic Sea.

Range: In general, Arctic America to the Baltic.

This genus has long been divided into two species in the Arctic, the author found no distinction between specimens at his disposal from the western Arctic at Bernard Harbour and specimens from Baffin and Hudson Bay. Richardson

who originally described hexacornis as a distinct species concluded later after he had examined more specimens that he was in error.[1]

In our region this form has been taken in Fox Basin, Melville Peninsula (Hildebrand 1939) Southhampton Island (Henn 1932), a number of stations in Hudson and James Bay (Vladykov 1933) Southern Baffin Island (Manning 1942). Pfaff (1937) listed this form from Chesterfield Inlet and Vansitart Island, Danish Island and King William Land. Ross (1835) reported this form from Prince Regent Inlet.

The National Museum of Canada has a large number of specimens of this form taken at Bernard Harbour in Northwest Territory, where judging by the number of specimens brought back this was the commonest sculpin in the area.

This fish is recorded farther north than any marine fish in the Canadian Arctic. Gunther (1877) reports on a specimen taken at Dumbell Harbour on Ellesmere, Land in lat. 82° 30' north by the British Arctic expeditions of 1875-6.

Of its occurrence in west Greenland Jensen (1903) states that this form does not go further south than Baffin Bay.

A single small specimen of this fish was taken by the Dunbar expedition of 1947 in Leaf Bay at about fifteen meters. No specimens were recognized in the hundred of

1. Sir John Richardson App. to Belcher's Last of the Arctic Voyages in Search of Franklin 1854.

cottoid larvae obtained by this expedition in Ungava Bay.

This form replaces M. scorpius in the littoral zone of high arctic regions. The habits of this form are much the same as M. Scorpius.

Gymnocanthus tricuspis (Reinhardt)
Cottus tricuspis Reinhardt Vid. Selsk Nat. Math., V. 1832, LII, Greenland

Range: In general, the Arctic seas south to Norway and Labrador.

Considerable taxonomic confusion exists as to the delination of species of this group. Dr. L.P. Schultz of the United States National museum kindly granted me use of his manuscript on the taxonomic characters of species belonging to this genus. In our region this form has been recorded from the following regions, localities along the west Greenland coast by many authors since Fabricius in 1780; northernmost locality Sauder Island (Fowler (1914); Jensen (1910) Jones Sound, Bean (1880) Cumberland Gulf, Baffin; Gunther (1860) from Port Leopold, Prince Regent Inlet, Hildebrand (1939) Barrow River, Fox Basin; Vladykov (1933) Hudson Bay, James Bay and Port Burwell, Ungava; Dunbar (1947) Lake Harbour Baffin Island. Pfaff (1937) Eskimo Point, Hudson Bay.

Four adult specimens of this species were taken off Keglo Bay on the east coast of Ungava Bay by jigging in 25 meters of water. These specimens were all adult ranging in length from 190mm to 200mm. The two males and two females in this group exhibited wide sexual dimorphism.

The rays of the ventrals were prelonged in the males to nearly the middle of the anal fin, while those of the female barely reached the vent. The anal papilla is greatly developed in the male while only slightly so in the female. The abdomen was white in the females while in the males it was flecked with black pigment. The first dorsal fin of the males were elongated and black with three rows of light bars across the fin, while in the females, the first dorsal was light with a few dark streaks. The pectoral fins and ventrals were roughened in the males. The upper surface of the head was entirely smooth, while in the males bony granulations were present from the interorbital spaces to the insertion of the first dorsal.

The last named character prompted the author to investigate more closely this character of specimens of Gymnocanthus in the United States National Museum and in Michigan University Museum of Zoology as this character was one which had prompted Vladykov (1933) to describe a new subspecies from Hudson Bay and to recognize the Pacific form G. galeatus from Hudson Bay. Twenty-three adult specimens of Gymnocanthus tricuspis.from Greenland, Labrador and Ungava were examined. Entire absence of bony granulation was found in 6 females and one male, very few scattered granules in 4 males and 1 female,granules abundant and present in the interorbital space in 6 males and five females. This would show that the taxonomic value on which Vladykov based his subspecies G.t. hudsonicus is not valid. Eighteen specimens of Gymnocanthus pistilliger from Alaska were examined. Bony

granulation was found to be abundant on fourteen, 9 females and five males, and weak on the remainder. Eight specimens of G. galeatus were examined, bony granulation on the head was found to be abundant in all, 3 males and 5 females. The one specimen of G. galeatus identified from Hudson Bay on the basis of this character, must be placed in the doubtful list as occurring in our region.

This species is commonest around 30 meters just outside the shore zones of M. scorpius. The writer took only one small specimen about 2 inches long in tidal pools in Ungava in 1947. Hofsteen (1919) gives the vertical range of this form as from 2 to 150 meters.

Food: It feeds mainly on crustacea.

This form has no economic value, and is rarely taken by the natives.

Gymnocanthus pistilliger (Pallas)
Cottus pistilliger Pallas Zoog. Rosso Asiat III, 1811, 143, Unalaska

Range: In general, the coasts of Alaska to the Mackenzie River district. In our region this form is included on the basis of two small specimens in the National Museum of Canada collected by Fritz Johansen in Dolphin and Union Strait at Bernard Harbour. These specimens were identified by Fritz Johansen, at the present time they are in too poor a state of preservation for the author to check the identification. This species is closely related to G. tricuspis, and further critical study may prove them the same species.

In habits this form is similar to G. tricuspis

Cottunculus microps Collett
Cottunculus microps Collett Norges Fiske, 1875, 20
Hasvig near Hammerfest, Norway in 200 fm.

Range: In general, the North Atlantic south to Rhode Island in deep water. In our region, this form is known from Davis Strait where it has been taken from both sides of the submarine ridge between Greenland and Baffin. (Jensen 1926).

This deep water sculpin has no economic importance,

Cottunculus thompsonii (Gunther)
Cottus thompsonii Proc. Roy Soc. Edinburg XI 1883, 679,
Faroe Channel in 535 fathoms.

Range: In general, the North Atlantic in deep water from Davis Strait to Faroes Islands. Jensen (1926) records two specimens of this form taken in Davis Strait at latitude 66° 37' N and 56° 37' west Long. in 450 meters of water.

This deep water form is rare in our region and has no economic importance.

Leptagonus decagonus (Bloch & Schneider)
Agonus decagonus Bloch and Schneider Syst Ichth, 1, 1801, 105
erroneously recorded from East Indies type from Greenland.

Range: In general, the Arctic Ocean south to Newfoundland and Norway. In our region, Jensen (1942) summarized its occurrence in West Greenland waters as follows, it occurs along the coast and in the straits from Fiskeness (about 63° N) to Smith Sound (about 78°N). Other localities in our region are Exeter Sound, Baffin (Jensen 1942) and Dunbar (1947) reported planktonic young from Lake Harbour Baffin.

Habits: Jensen (1942) writes that this is a high northern form which thrives at bottom temperatures ruling around 0°C, with a bathymetrical distribution from 36 to 740 meters.

This fish has no economic importance except as food for seals and other marine fish.

Aspidophoroides monopterygius (Bloch) sea poacher
Cottus monopterygius Bloch Ichth, II, 1786, 156 Tranquebar an error, probably Greenland.

Range: In general, Greenland to Cape Cod, accidental to New York. In our region known only from the west coast of Greenland, and Exeter Sound Baffin. Jensen(1942) gives stations for its occurrence in west Greenland from Ivigtut to Jacobshavn along the coast, and in the strait from 61° N to 71° north latitude. The one occurrence recorded from Baffin was taken by the "Godthaab" on Sept. 17, 1928.

This fish has no economic importance.

Aspidophoroides olriki Lutken
Aspidophoroides olriki Lutken Vid. Medd Naturh Foren Kbhvn. 1876, 386, Greenland.

Range: In general, West Greenland, Hudson Bay, Murman Sea, Kara Sea, Bering Straits and south to Newfoundland Banks on the east coast of North America. In our region Jensen (1942) listed stations for this form on the west coast of Greenland from latitude 67° to 71° North. Vladykov (1933) recorded this form from Hudson Bay, Loubryne Stations 27 & 28. Dunbar (1947) recorded plankton young from Lake Harbour, Baffin.

Two plankton young of this form were obtained in southwest Ungava Bay in 1947. One adult specimen was taken in a dredge in Keglo Bay on the east coast of Ungava Bay in about 25 meters of water.

This bottom living form has no economic importance.

Cyclopterus lumpus Linnaeus Lumpfish
Cyclopterus lumpus Linnaeus Syst Nat Ed. X, 1758, 260 Baltic and North Sea.

Range: In general, the north Atlantic from Greenland south to Cape Cod on the American coast and south to France on the European coast. In our region Jensen (1942) summarized its occurrences as follows, sparingly in the Umanak district and from there southward to the southwestern tip along the shore and among the islands. Bean (1879) recorded this form from Cumberland Gulf, Baffin. Specimens from the Hudson Bay are usually separated into a separate subspecies hudsonicus. In Hudson Bay they are known from James Bay and the vicinity of Churchill (Vladykov 1933).

This fish has no commercial importance although valued highly as food by the Greenland natives.

Fabricius (1780) stated that they eat chiefly jelly fish (Ctenophores, Beroe, Pteropods, Clione borealis and similar jellyfish).

In Greenland they spawn toward the end of May or beginning of June. The male guards the eggs.

Eumicrotremus spinosus (Muller) spiny lumpfish
Cyclopterus spinosus Muller Prodr. Zool. Dan. IX, 1777, after Fabricius

Range: In general, widespread, the North Pacific south to Kuriles, east and west Greenland, Cape Napoleon

Grinnel Land to Hudson Bay and Maine, East to Spitzbergen and Norway. In our region, Jensen (1942) summarised its occurrence as along west Greenland from 60°N to 77° 17' north latitude. Elsewhere in our region it has been reported at Cape Napoleon, and Franklin Pierce Bay, Ellesmere, Gunther (1877), Jones Sound, Jensen (1910); Frozen Strait, Fox Basin, Hildebrand (1939); Pfaff (1937) Roes Welcome. Vladykov (1933) reported this form from Hudson Bay "Loubryne" station 49. Dunbar (1947) obtained plantktonic young at Lake Harbour, Baffin.

One young specimen of this form was taken in a dredge in Keglo Bay on the east Coast of Ungava in 1947.

This small lumpfish has no economic importance.

Eumicrotremus derjugini Popov.
Eumicrotremus derjugini Popov Trans. Soc. Nat. Leningrad Sect. (ICR) Vo. 56, 1926 Kara & Barents Seas.

Range: In general, circumpolar, reported from Kara and Barents Sea, Okhotsk Sea, Hudson Bay and Strait and Labrador. In our region this species was first recognized by Vladykov in 1933. The "Loubryne" obtained 14 specimens of this form at 6 different stations in Hudson Bay.

Habitat as given by Vladykov is deep salt water (54 to 150 meters) on muddy, gravelly, or stony bottoms and low temperatures.

This form has no economic value. Two specimens were taken from cod stomachs at Port Burwell (Vladykov 1933).

Cyclopteropsis malcalpini (Fowler)
Lethotremus macalpini Fowler, Proc. Acad. Nat Sci. Phil Vol LXVI, 1914, 360 Ulrik Bay, Greenland.

Range: In general, known from northwest Greenland and Barents Sea. In our region, known only from Ulrik Bay, northwest Greenland from whence it was described.

Lethotremus armouri Fowler
Lethotremus Armouri Fowler Proc Acad Nat. Sci. Phil LXVI, 1914, 361 Upernavik.

This rare form is known only from the type specimens taken at Upernavik by the Peary Relief Expedition of 1899.

Liparis atlanticus (Jordan & Evermann) sea snail
Neoliparis atlanticus Jordan and Evermann, Fish of North and Middle America, 1898, 2107 Godbout, Quebec.

Range: In general, the rocky shores from Ungava Bay to Cape Cod.

In our region, the inclusion of this species is based on a single specimen which the author took in 1947 in a tide pool in Keglo Bay, east coast of Ungava Bay. This specimen agrees with the description as given in Jordan and Evermann. A very pronounced dorsal notch is present with the four rays in front of the notch prolonged.

Liparis tunicatus Reinhardt
Liparis tunicata Reinhardt Overs Kong. D. Vidensk, Selsk Vi. CXI 1836, Greenland after Fabricius.

Range: In general, west and east Greenland south to Ungava and Labrador. The taxonomy of the northern Liparids are in need of revising. The author has followed Burke(1930) the latest revisor of the genus Liparis. However, the writer is aware that Danish authors do not recognize the

Greenland liparids as being distinct from the European forms. Reinhardt's[1] description of Liparis tunicatus is inadequate to properly determine the form to which the name should be applied. All records of Liparis liparis from our region will be given under Liparis tunicatus in this paper.

In our region, a number of localities along the west coast of Greenland. The farthest north locality is Etah (Fowler 1914). Elsewhere this form has been recorded from Lyon Inlet, Fox Basin (Hildebrand 1939); Vansittart Island (Pfaff 1937); Jones Sound (Jensen (1910); Prince Regent Inlet Gunther (1860); Cumberland Gulf, Baffin (Bean 1779).

In Ungava Bay this species was taken in a dredge in 15 meters of water in Leaf Bay, Ungava and also in tidal pools in Keglo Bay on the east coast of Ungava Bay. In Burke's Revision of the Liparidae, his description of Liparis tunicatus was based on specimens collected in Ungava Bay by L.M. Turner in 1882.

This is a shallow water species inhabiting the tidal pools down to three hundred metres (Burke 1930).

This form has no economic importance although it forms a small item of food for the seals and codfish in this region.

Liparis major Gill
Liparis major Gill Proc. Acad Sci. Phila;, XVI, 1864, 193 Greenland

Range: In general west and east Greenland.

1."there also exists in Greenland seas the Cyclopterus liparis of Fabricius, which is named Liparis tunicatus on account of the peculiar loose adherence of the skin and which in its character has much similarity with the European species ilustrated by Yarrel in the British fishes but as the museum had in its possession only one badly preserved specimen no certain identification could be made." (translated by Gill 1864)

We have doubtfully placed Liparis fabricii in synonymy with this form. As the status of this form is unknown and the liparids in general have not been correctly determined we will give only a general range in our region. Jensen (1910) identified a specimen from Jones Sound as belonging to this species and Liparis fabricii has been reported from a number of places along the west Coast of Greenland. Dunbar (1947) identified planktonic young from Lake Harbour as belonging to L. Fabricii.

Liparis herschelinus Scofield
Liparis herschelinus Scofield in Jordan and Evermann Fishes of North and Middle America 1898, 2123, Herschel Island, Arctic Ocean.

This form is not well understood taxonomically, it may prove to be synonymous with L. tunicatus. It is known from the type locality at Herschel Island, N.W.T. and the author doubtfully refers a small specimen collected in Dolphin and Union strait by Fritz Johansen to this species.

Liparis cyclostigma Gilbert
Liparis cyclostigma Gilbert Rept. U.S. Fish Com.. XIX, 1893 446, Bristol Bay in 29 fathoms.

Range; In general, Alaska and Hudson Bay. The occurrence of this form in our region is based on two specimens taken at "Loubyrne" Stations 42 & 40 respectively and identified by Vladykov (1933).

Vladykov gives the habitat of this form in Hudson Bay as deep salt water (55 to 142 meters) on stony bottom.

Vladykov provisionally identifies several young specimens taken from the stomachs of cod (Gadus callarias) at Port Burwell as belonging to this species.

Careproctus reinhardti (Kroyer)
Liparis reinhardti Kroyer Naturh. Tidskr. I, 1862, 252, Greenland

Range: In general, the north Atlantic from Greenland to Spitzbergen. In our region reported from Umanak, and Jacobshavn, Lutken (1887)

This deep sea fish is quite rare in collections, it has no economic importance. Hofstenn (1919) reported its vertical distribution as between 100 to 1750 meters.

Ammodytes lancea Cuvier sand launces
Ammodytes lancea Cuvier Le Regne Animal Tome 11, 1829, 360

Range: In general, Greenland and Hudson Bay across the North Atlantic to Spitzbergen and England. In our region Jensen (1941) divides this form into two subspecies, Ammodyte lancea marinus occurring from Sydproven, Julianehaab district (60°25' N) to Proven (about 72° 20' N) and Ammodytes lancea dubius occurring from Sydproven to Umanak district in Latitude 70° 40' north.

Vladykov (1933) describes a new subspecies hudsonicus from Hudson Bay, this subspecies is probably referable to L. lancea. Specimens of this form were taken at Churchill, Hudson Bay, Cape Merry, James Bay and at Suglek and Diana Bay in Hudson Strait.

Pfaff (1937) reports A. lancea from Eskimo Point Hudson Bay and from Kent Peninsula, N.W.T.

Dr. M. Dunbar took 173 larval forms of Ammodytes in a Plankton haul near the estuary of Tunulik River, southern Ungava Bay. These specimens were too small to identify with certainty as to species.

This species is economically important as one of the favorite food of cod. In Ungava Bay although larval Ammodytes were taken, no adult specimens were taken, and none were taken in cod stomachs at Port Burwell.

Pholis gunnellus (Linnaeus) gunnel
Blennius gunnellus Linnaeus Syst Nat ed, X, 1758, 257
Atlantic Ocean.

Range: In general, the North Atlantic from Greenland to Cape Cod and from the Murman Coast to northern France. In our region is known only from the west Greenland coast. Jensen (1942) summarized the occurrence of this form in west Greenland waters on the basis of specimens preserved in the Copenhagen Museum. The museum has specimens from a number of places between Julianehaab and Holsteinsborg (lat. 60° 40' N to 67°N)

Pholis fasciatus (Bloch Schneider)
Centronotus faciatus Bloch and Schneider Syst Ichth. 1801, 165, Tranquebar, an error

Range: In general, Hudson Bay, West Greenland and Bering Sea. Jensen (1942) summarized the occurrence of this form based on one hundred specimens in the University of Copenhagen museum as between 60° to 73° north latitude on the west coast of Greenland. Six specimens of this form were taken at Cape Merry Peninsula in 1929 (Vladykov 1933). Richardson (1854) reported a specimen from Northumberland Sound, northwest Devon Island.

This fish is an inhabitant of the shore salt water among the rocks and laminaria, it has no economic importance.

Stichaeus punctatus (Fabricius) spotted snake blenny
Blennius punctatus Fabricius Fauna Groenlandica 1780,153
Greenland

Range: In general, Greenland, Hudson Bay south to

Newfoundland, also Bering Sea south to Japan. In our region Jensen (1944) stated, on the basis of 70 specimens in the Copenhagen Museum, that this form occurs between 60° to 73° north in the shore zone of West Greenland. Vladykov (1933) recorded this form from Cape Merry Peninsula, and "Loubryne" Station 9 in Hudson Bay. The National Museum in Ottawa has specimens from Fullerton, Hudson Bay.

This form has no economic importance.

Eumesogrammus praecisus (Kroyer)
Chirus praecisus Kroyer Naturh. Tidaskr. 1, 1837, 25, Greenland

Range: In general, west Greenland to Ungava, also reported from Okhotsk Sea. Jensen (1944) summarized the occurrences of this form from 28 specimens in the Copenhagen Museum. It extends along the west Greenland coast from 60° to 73° north from the seaweed belt out to a depth of 400 meters.

Vladykov (1933) recorded a specimen of this fish taken from cod stomachs at Port Burwell, Ungava. The writer obtained another in the same way in 1947. One specimen in National Museum of Canada obtained at Victoria Island, N.W.T.

Lumpenus maculatus (Fires)
Clinus maculatus Fries Kgl. Sv. Vet. Ak. Handl 1837, 51
Bohuslan, Sweden

Range: In general the north Atlantic from Greenland south to New England on the American coast, and south to Scandinavia on the European coast. In our region reported only from the west coast of Greenland and Jones Sound (Jensen 1944). On the basis of 140 specimens

in the Copenhagen Museum Jensen delimited its occurrence as from Ivigtut north to Jacobshavn.

Lumpenus lampetraeformis (Walbaum)
Blennius lampetraeformis Walbaum Artedi Pisc. Ichth III, 1792, 184

Range: In general, west and east Greenland, Iceland, Faroes and the east coast of America to Cape Cod. On the basis of 44 museum specimens Jensen (1944) delimits its range in west Greenland as along the coast from Godthaab to Jacobshavn and out in the Strait from 65° 17'N to 66° 45'N. This species has not been recognized elsewhere in our region.

Lumpenus fabricii Reinhardt
Lumpenus fabricii Reinhardt K.D. Vid. Selsk Forh. 1835-6, 10 Greenland

Range: In general, widespread, West Greenland to St. Lawrence, east to Nowaya Zemlya, also Bering Sea. In our region Jensen (1944) delimits its range on the west Greenland coast as between Nanortalik to Godhavn (60° to 69° 15' N). Richardson (1854) reported this form from Northumberland sound as L. nubilus. Vladykov (1933) reported this form from Cape Merry Peninsula, Fort Churchill and "Loubyrne" Station 17, in Hudson Bay.

Larval forms of this species were taken in Ungava Bay with plankton trawls in 1947 at Port Burwell and near Tunulik in southeastern Ungava.

Lumpenus medius (Reinhardt)
Clinus medius Reinhardt K.D. Vid. Selsk. Skr. Afh. VII 1838, 114, 121, Greenland.

Range: In general, Greenland, Bering Sea, North Europe andSpitzbergen. Jensen (1944) stated that all

specimens with data in the Copenhagen Museum came from the Disco Bay area, north to Umanak and Northeast Bay (71° 21' N.) Reinhardt however stated that his type specimen came from Fiskeness. This species is known from nowhere else in our region.

Anarrhichas lupus Linnaeus
Anarrhichas lupus Linnaeus Syst. Nat. ed X, 1758, 247

Range: In general, the north Atlantic south to Cape Cod and France. In our region has been reported only from the west coast of Greenland. VanHoffen (1897) reported this form from Umanak Fjord.

Anarrhichas minor Olafsen
Anarrhichas minor Olafsen Reise Island sec 682b, 1774, Iceland

Range: In general North Atlantic on both coasts south to Maine on the American Coast. In our region this form has been reported from Davis Strait by many writers without definite locality. Jensen (1926) reported this form from north of the submarine ridge in Davis Strait at 68° 08' N L. and 57° 30' Long.

Anarrhichas denticulatus Kroyer
Anarrhichas denticulatus Vid. Selsk Overs. 1844, 140

Range: Davis Strait. The exact systematic position of this form is in doubt, it was originally described from Davis Strait. Jensen (1926) recorded this species from south of the submarine ridge in Davis Strait (66° 37' N L. 57° 37' W long.)

Lycodes vahlii Reinhardt
Lycodes vahlii Reinhardt K.D.Vid.SelskNat og Math.Afh VII 1838, 153, Greenland

Range: In general, the north Atlantic from

Scandinavia to Greenland to Nova Scotia in deep water. This form has been divided into three subspecies by Jensen (1904) on the basis of increase in vertebrae and fin ray count from Scandinavia to Greenland. The subspecies occurring in Greenland being L. vahlii vahlii. This form has been reported from Davis Strait by a number of authors since Reinhardt's time. The "Dana" obtained specimens of this form in the deep water north of the submarine ridge in Davis Strait. (68° 08' N).

Jensen (1904) gave the vertical distribution as from thirty to 300 fathoms. Food consists chiefly of crustacea and small bivalves.

Lycodes reticulatus Reinhardt
Lycodes reticulatus Reinhardt K.D. Vid. Selsk. Afh. VII, 1838, 167, Greenland.

Range: In general, the north Atlantic from Greenland, Hudson Bay and south to New England. This form has been reported from Murchison Sound and Inglefield Gulf by Holmquist (1899) as L. lutkenii. Other localities in west Greenland are Julianehaab, Fishenaes, Godthaab and Umanak, Jensen (1904). Vladykov (1933) recognized the Hudson Bay form as Lycodes r. hacheyi, which is based on two specimens taken at "Loubyrne" Stations 36 & 45 in the bay.

A large specimen of this form was obtained at Port Burwell, Ungava Bay by Dr. Dunbar and the writer on a long line in 40 meters of water in 1947.

This form feed chiefly on crustacea, copepods, isopods, amphipods and decapods.

Lycodes esmarkii Collett
Lycodes esmarkii Collett Norges Fiske, 1875, 95

Range: In general the north Atlantic and west Greenland. In our region, this form has been taken in Davis Strait. Jensen (1926) listed a capture south of the submarine ridge in 450 meters of water.

This form seems to feed almost exclusively on echinoderms especially ophiuroids, (Jensen 1904).

Lycodes eudipleurosticus Jensen
Lycodes eudipleurosticus Jensen Dan. Ingolf Exped. Vol.2, Part4

Range: In general, northern west and east Greenland east to Norway and Shetland Island in deep water.

In our region recorded from Umanak (Jensen 1904) and Davis Strait north of the submarine ridge (Jensen 1926).

This is a deep cold water form, inhabiting depths from 150 to 400 fathoms. Jensen 1904)

Lycodes seminudus Reinhardt
Lycodes seminudus Reinhardt K.D. Selsk, Afh VII, 1838, 221 Umenak, Greenland.

Range: In general the north Atlantic from Greenland to Spitzbergen. In our region Jensen (1904) recorded this form from Umanak, Jacobshavn, and Upernavik.

Lycenchelys ingolfianus Jensen
Lycenchelys ingolfianus Jensen Dan. Ingolf. Exped. Vol. 2, Part 4 Davis Strait

This deep water form is known only from Davis Strait from where it was described by Jensen. The type specimens was taken in 393 fathoms of water.

Lycodalepis polaris (Sabine)
Blennius polaris Sabine, Parry's Journ. 1st voyl 1819-20 App. CCXII North Georgia (Melville Island).

Range: In general Arctic America and Bering Straits. The author recognizes the following described species as synonymous Lycodes turneri Bean, Lycodes coccineus Bean and Lycodes mucosus Richardson. In our region, this species has been reported from Melville Island (Sabine 1823), Northumberland Sound, (Richardson 1854), Cumberland Gulf (Bean 1879), Cape Rutherford (Jensen 1914), Saunders Island (Fowler 1914). Vladykov doubtfully identifies a specimen taken at Cape Merry in Hudson Bay in a mutilated condition as belonging to this species.

Gymnelis viridis (Fabricius)
Ophidium viride Fabricius Fauna Groen. 1780, 141, Greenland.

Range: In general, circumpolar in the Arctic regions. In our region reported from Franklin Pierce Bay, Ellesmere, and Ellesmere Lat 81° 52' N. (Gunther 1877); Jones Sound (Jensen 1910); Prince Regent Inlet (Ross 1835); Bellot Straits Gunther (1860); Cumberland Gulf (Bean 1880); Cobourg Island in Baffin Bay and entrance to Fury & Hecla Strait, Fox Basin (Hildebrand 1939); Hudson Bay and Port Burwell, Ungava, (Vladykov 1933). Several specimens of this form were taken from cod stomachs by the writer in 1947 at Port Burwell, Ungava.
Ophidium parrii of Ross is considered as a synonym of G. viridis by the writer.

This form is predominantly a shallow water form in the Arctic, being a common inhabitant of the laminaria zone.

Bythites fuscus Reinhardt
Bythites fuscus Reinhardt K.D.Vid. Selsk. Skr. Afh.VII 1838, 179, Greenland

This species is known only from a single specimen obtained in the sea weed zone of Fiskenaes over a century ago. The type specimen is in the University of Copenhagen Museum.

Ceratias holbolli Kroyer
Ceratias holbolli Kroyer Naturh Tidskr. 1844, 639 Greenland.

Range: In general, Greenland to Nova Scotia. In our region this form is known only from Greenland from whence it was described.

Oneirodes eschrichtii Lutken
Oneirodes eschrichtii Lutken Overs. Dansk. Vid Selsk Forh. 1871, 56 deep sea off Greenland

Range: the rare deep sea fish is known in our region from the type locality only.

Himantolophus groenlandicus Reinhardt
Himantolophus groenlandicus Reinhardt Dansk Vid. Selsk. Nat. Math Afh. 1837, 74, Greenland

This deep water form is known in our region only from the type specimen.

General Discussion

The Canadian Arctic is a part of the polar mediterranean sea. This sea has a relatively broad connection with the Atlantic Ocean between east Greenland and Norway. However, even here there is not a free communication between the deep water of the Atlantic and polar basins due to the presence of the Wyville Thompson submarine ridge. This ridge is continued between Greenland and Baffin Island at latitude 67° north. Connection with the Pacific is through the narrow Bering Strait.

The two main outflows of polar water from our region are around the north of Greenland, and through Lancaster Sound. The former current is known as the east Greenland current and it also exerts an influence on the southwest part of Greenland in the region of Cape Farewell. The Lancaster Sound current follows the east shore of Baffin Island.

Atlantic water enters the polar sea in two main areas. The Atlantic Drift which goes to the north of Europe and reaches Spitzbergen, and the Irminger Current which branches off from the Atlantic Drift in the vicinity of Iceland and goes to Greenland.

The hydrographic conditions of the vast area that makes up the Canadian Arctic are unexplored. Only in west Greenland and in Hudson Bay are hydrographic conditions known. An examination of the fish fauna will show an abundance in

numbers and species in the west Greenland regions, and as we progress westward a decrease until the Mackenzie River district is reached. For the purpose of discussion, the region has been divided into five sections, as would be indicated from the fish fauna. However, it should be recognized that the region in general is so poorly known, that such divisions are open to dispute, especially their boundaries. These regions as herein delineated are West Greenland, Hudson's Bay and Strait, Boothia, Mackenzie and the High Arctic.

West Greenland is characterized by the richest fauna in our region. This is due to the strong influx of Atlantic water via the West Greenland Current. This maintains a deep "warm" layer of water of 3° C. or higher south of the submarine ridge in latitude 67° north. The area along the west Greenland coast is further marked by the presence of banks, such as Lille Hellefiske, Store Hellefiske and Fyllas Banks. This area intergrades into true Arctic conditions in southwest Greenland in the vicinity of Cape Farewell where the influence of the East Greenland Current is predominant. Migratory fish make their way over to the banks and in toward the coast during the summer months. Atlantic influence is detected much further north although it gradually becomes weaker, until in the region of Upernavik, few if any Atlantic forms are detected in the fauna. The following fishes have been taken from the West Greenland Region:

1. Myxine glutinosa
2. Petromyxon marinus
3. Squalus acanthias
4. Centroscyllium fabricii
5. Somniosus microcephalus
6. Raja radiata
7. Raja fyllae
8. Raja lintea
9. Raja spinicauda
10. Clupea harengus
11. Salmo salar
12. Salvelinus alpinus
13. Mallotus villosus
14. Nansenia groenlandica
15. Bathylagus benedicti
16. Cyclothone microdon
17. Argyropelecus olfersi
18. Notacanthus chemnitzi
19. Notacanthus rostratus
20. Anguilla bostoniensis
21. Synaphobranchus pinnatus
22. Histiobranchus infernalis
23. Saccopharynx ampullaceus
24. Paralepis corregonoides borealis
25. Paralepis risso kroyeri
26. Lampanyctus crocodilus
27. Myctophum arcticum
28. Myctophum glacialis
29. Alepisaurus ferox
30. Coryphaenoides rupestris
31. Macrourus berglax
32. Macrourus goodei
33. Gaidropsaurus ensis
34. Gaidropsarus septentrionalis
35. Ciliata argentata
36. Boreogadus saida
37. Pollachius virens
38. Gadus callarias
39. Gadus ogac
40. Melanogrammus aeglefinus
41. Molva molva
42. Brosmius brosme
43. Trachipterus arcticus
44. Reinhardtius hippoglossoides
45. Hippoglossus hippoglossus
46. Hippoglossoides platessoides
47. Glyptocephalus cynoglossus
48. Gasterosteus aculeatus
49. Sebastes marinus
50. Artediellus uncinatus
51. Icelus bicornis
52. Triglops pingeli
53. Myoxocephalus scorpius
54. Myoxocephalus scorpiodes
55. Gymnocanthus tricuspis
56. Cottunculus microps
57. Cottunculus thompsonii
58. Leptagonus decagonus
59. Aspidophoroides monopterygius
60. Aspidophoroides olriki
61. Cyclopterus lumpus
62. Eumicrotremus spinosus
63. Liparis major
64. Liparis tunicatus
65. Careproctus reinhardti
66. Ammodytes lancea
67. Pholis gunnellis
68. Pholis fasciatus
69. Stichaeus punctatus
70. Eumesogrammus praecisus
71. Lumpenus maculatus
72. Lumpenus lampetraeformis
73. Lumpenus fabricii
74. Lumpenus medius
75. Anarrhichas lupus
76. Anarrhichas minor
77. Anarrhichas denticulatus
78. Lycodes vahlii
79. Lycodes reticulatus
80. Lycodes esmarkii
81. Lycenchelys ingolfianus
82. Gymnelis viridis
83. Bythites fuscus
84. Ceratias holbolli
85. Oneirodes eschrichtii
86. Himantolophus groenlandicus

These eighty-six species represent long years of observations in the Greenland region. Some are known from a very few specimens especially the deep sea forms. Some are merely strays and take advantage of climatic cycles to enter the

region. Index forms for Atlantic influence are Myxine glutinosa, Squalus acanthias, Clupea harengus, Salmo salar, Mallotus villosus, Pollachius virens, Gadus callarias, Sebastes marinus, and many of the deep water forms.

Hudson Bay and Strait is an area well defined by coastal outline and occupies the area from the eastern to the central part of the Canadian Arctic. Hydrographically this area is characterized by low temperature and salinity, well stratified water layers with little vertical movement. Northeastern Ungava Bay is influenced by the entrance of Atlantic water with a consequent increase in the fauna. This area will be considered separately. The chief wealth in fisheries in the Hudson Bay lies in the anadromous forms, Salmonidae and Coregonidae. The following species of fish have been taken from this region:

1. Somniosus microcephalus
2. Raja radiata
3. Acipenser fulvescens
4. Salvelinus fontinalis
5. Salvelinus alpinus
6. Leucichthys artedi
7. Coregonus clupeaformis
8. Prosopium cylindraceum
9. Mallotus villosus
10. Boreogadus saida
11. Gadus ogac
12. Gasterosteus aculeatus
13. Pungitius pungitius
14. Icelus bicornis
15. Triglops pingeli
16. Myoxocephalus scorpius
17. Myoxocephalus scorpiodes
18. Oncocottus quadricornis
19. Gymnocanthus tricuspis
20. Leptagonus decagonus
21. Aspidophoroides olriki
22. Cyclopterus lumpus
23. Eumicrotremus spinosus
24. Eumicrotremus derjugini
25. Liparis tunicatus
26. Liparis cyclostigma
27. Ammodytes lancea
28. Pholis fasciatus
29. Lumpenus fabricii
30. Lycodes reticulatis
31. Lycodalepis sp.
32. Gymnelis viridis.

Ungava Bay at least in part represents a transition area between the conditions of Hudson Bay and Atlantic influence. The following species have been taken from that region. The strongest influence on Atlantic water is

exerted in the Port Burwell area of northeastern Ungava Bay;

1. Somniosus microcephalus
2. Salmo salar
3. Salvelinus alpinus
4. Coregonus clupeaformis
5. Leucichthys artedi
6. Prosopium cylindraceum
7. Mallotus villosus
8. Paralepis risso kroyeri
9. Lampanyctus crocodilus
10. Myctophum sp.
11. Boreogadus saida
12. Gadus callarias
13. Gadus ogac
14. Reinhardtius hippoglossoides
15. Gasterosteus aculeatus
16. Pungitius pungitius
17. Sebastes marinus
18. Triglops pingeli
19. Myoxocephalus scorpius
20. Myoxocephalus scorpiodes
21. Oncocottus quadricornis
22. Gymnocanthus tricuspis
23. Aspidophoroides olriki
24. Eumicrotremus spinosus
25. Liparis atlanticus
26. Liparis tunicatus
27. Ammodytes lancea
28. Eumesogrammus praecisos
29. Lumpenus fabricii
30. Lycodes reticulatus
31. Gymnelis viridis

Kendall (1909) published a paper on the Fishes of Labrador, in this paper he included the identification of specimens in the United States National Museum taken by L. M. Turner in 1882-4, and simply labeled Labrador collection. As the majority of Turner's time was spent during these years at Fort Chimo Kendall assumed that the majority came from that region but there was no way of knowing which ones. The author located Turner's unpublished manuscript, which revealed that he had done collecting at Rigolet, Davis Inlet and Navchak along the Labrador Coast. Collections made at these points have been included in the fauna of Ungava Bay by Kendall (1909) and Vladykov (1933). The inclusion of two species of flatfish were revealed to be in error.

The writer reports the following species from Ungava Bay obtained for the first time in 1947.

1. Paralepis risso kroyeri
2. Lampanyctus crocodilus
3. Myctophum sp.
4. Reinhardtius hippoglossoides
5. Sebastes marinus
6. Oncocottus quadricornis
7. Aspidophoroides olriki
8. Eumicrotremus spinosus
9. Liparis atlanticus
10. Ammodytes lancea
11. Lumpenus fabricii
12. Lycodes reticulatus

Boothia is a relatively unknown region. This was included as a separate region because the long jutting peninsula separated from Somerset Island by the narrow Bellot Strait forms a barrier to migrating species of fish. That the capelin may use this strait is indicated in one of the letters from a Hudson Bay employee to the Royal Ontario Museum as previously discussed, but for the larger part of the year it is blocked by ice. The following species have been reported from this region.

1. Salvelinus alpinus
2. Mallotus villosus
3. Boreogadus saida
4. Gadus ogac
5. Myoxocephalus scorpius
6. Myoxocephalus scorpiodes
7. Porocottus polaris
8. Oncocottus quadricornis
9. Gymnocanthus tricuspis
10. Gymnelis viridis

Mackenzie district is characterized by the number of rivers which bring their rich organic loads to the sea in this region. The influence of the Pacific water in this region is unknown although some Pacific forms do migrate into the region. The eastern boundary of this region was set at the Back River. The Northern boundary would be the south coasts of Victoria and King William Land. The fauna here as would be expected consists of anadromous forms, and sculpins. The following species have been reported from this region or are reported for the first time in this paper based upon an examination of the Canadian Arctic Expedition Collection of 1914-18.

1. Salvelinus alpinus
2. Stenodus leucichthys
3. Leucichthys autumnalis
4. Leucichthys sardinella
5. Coregonus clupeaformis
6. Prosopium cylindraceum
7. Mallotus villosus
8. Osmerus dentex
9. Boreogadus saida
10. Gadus ogac
11. Eleginus gracilis
12. Platichthys stellatus
13. Liopsetta glacialis
14. Pungitius pungitius
15. Artediellus uncinatus
16. Icelus bicornis
17. Myoxcephalus scorpius
18. Myoxcephalus scorpiodes
19. Oncocottus quadricornis
20. Gymnocanthus pistilliger
21. Liparis herschelinus
22. Ammodytes lancea
23. Eumesogrammus praecisus

The High Arctic region is here designated to include Parry and Sverdrup Archipelago, Ellesmere Island and Northwest Greenland. This region is characterized by the paucity of fauna. In extreme north Ellesmere only two forms, Oncocottus quadricornis and Salvelinus alpinus have been recorded. The islands are characterized by the poor circulation of water with the consequent prolonged period of ice coverage.

The following forms have been recorded from this region.

1. Salvelinus alpinus
2. Mallotus villosus
3. Boreogadus saida
4. Gadus ogac
5. Gasterosteus aculeatus
6. Icelus bicornis
7. Triglops nybellini
8. Myoxocephalus scorpius
9. Porocottus polaris
10. Oncocottus quadricornis
11. Gymnocanthus tricuspis
12. Leptagonus decagonus
13. Cyclopterospsis malcalpini
14. Lethrotremus armouri
15. Liparis tunicatus
16. Pholis fasciatus
17. Lumpenus fabricii
18. Lycodalepis polaris
19. Gymnelis viridis.

This region is better known than much of the Canadian Arctic due to the large number of expeditions which have explored the region between Greenland and Ellesmere Island.

This leaves one region undiscussed. That is the area of Davis Strait north of the submarine ridge and Baffin Bay; This is a transition area from pure arctic on the Baffin

coast to a strong influence of Atlantic water on the Greenland Coast. The range of the two sculpins, Oncocottus quadricornis and Myoxocephalus scorpius has been used as a delineator of the High Arctic conditions. These two forms meet in the Thule district of Greenland.

The entire region is especially characterized by the paucity of species in the fauna. Bigelow and Welsh (1925) listed 198 species in their Fishes of the Gulf of Maine, while in this paper involving the vast area from Alaska to Greenland only 122 forms are discussed, and the forms diminish in number from 86 in the West Greenland area to only two in Northern Ellesmere.

The shore fauna is extremely poor consisting usually of a single species of sculpin. The seaweed zone has a slightly richer fauna with eellike blennies, sculpins and lumpfish predominating. The deep water fauna except in West Greenland is unknown. West Greenland deep water forms show a decided affinity with the Atlantic forms. Deepwater forms characteristically have wide distribution. The deep water of the arctic when investigated will probably reveal a few species of lycodid-like forms and also cyclopterids. Also characteristic of the arctic region are the development of anadromous forms. Possibly, the most numerous in point of number of any fish occurring in the arctic is Salvelinus alpinus. Pelagic forms are restricted to the arctic pollack, (Boreogadus saida) this form is commonly taken on the surface amidst the floating ice floes, and feeds on amphipods and other crustacea which are brought to the surface by upwelling currents.

The fauna of the Arctic from the basis of distribution can be divided into the following classes, deep water, casuals, anadromous, Atlantic influence, Pacific migrants, and high Arctic. One form could occur in several of these classes.

In studying distribution one should remember that it is a dynamic phenomena and is never static. Jensen (1939) has shown what a tremendous change can take place in the fish fauna due to a slight amelioration of climate. He cited the following species Squalus acanthias, Clupea harengus, Salmo salar, Mallotus villosus, Pollachius virens, Gadus callarias, Melanogrammus aeglefinus, Molva molva, Brosmius brosme and Trachipterus arcticus, which have increased in numbers or been taken for the first time in recent years in West Greenland. The Atlantic cod (Gadus callarias) has increased so much as to alter the economy of the Greenlanders.

The site of origin of the fish fauna of the Canadian arctic would appear to be the Bering Sea. This is attested by the similarities of the fauna of the two areas. Every genus of the families Cyclopteridae, Cottidae, Liparidae, Pholidae, Stichaeidae, Lumpenidae, Anarrhichididae and Zoaracidae, that is present in the Canadian Arctic is also present in the Bering Sea. Many of them are identical species. The number of recognized species of these forms is much greater in the Bering Sea, especially for the families Cyclopteridae, Liparidae and Cottidae. Herring, cod, and capelin of the two areas are so similar they can only with difficulty be told apart if at all. Other forms are invaders

from the Bering Sea, such as Platichthys stellatus, Liopsetta glacialis, Eleginus gracilis, and Onchorhynchus.

The Bering Sea was a favorable area for the development of northern forms, as Schmidt (1904) has pointed out, due to the reduced effect of glaciation in that region. The coasts of Alaska and Pacific Siberia were not heavily glaciated and during part of the Pleistocene Bering Strait was closed, which prevented an influence of polar ice.

Summary

One hundred and twenty-two species of fish are discussed in this paper from the point of view of distribution, habits and economic importance when known. These species represent forty-three families of fish.

The following fish were found to be developed commercially in west Greenland waters. Gadus callarias is the mainstay of the Greenland fishery. Other fish taken commercially in Greenland are Reinhardtius hippoglossoides, Somniosus microcephalus, Sebastes marinus, Hippoglossus hippoglossus, Salvelinus alpinus, and Clupea harengus. Fish which figure into the native economy of the region but not the commercial catch are Mallotus villosus, Gadus ogac, Myoxocephalus scorpius, Cyclopterus lumpus, and Macrourus.

In the remainder of the North American Arctic except for Ungava Bay, where a commercial salmon fishery was established for a number of years, the fishery has all been on a native subsistence basis. The most valuable fish to the

native population throughout most of the Canadian Arctic is Salvelinus alpinus. This fish is replaced by the Coregonidae in the Mackenzie delta district. Also eaten by the natives are species of sculpins, polar cod, Greenland cod and flat-fishes, but these forms do not form a large part of the native diet in the Canadian Arctic.

In the discussion of Distribution, the region under consideration was divided into five areas, West Greenland, Hudson' Bay and Strait, Boothia, Mackenzie, and the High Arctic. Two transition zones were also recognized in Ungava Bay and Baffin Bay.

A brief mention is made of the fauna change in recent years in West Greenland, where many Atlantic forms have become more numerous due to a recent amelioration of climate.

The Bering Sea is briefly discussed as the possible center of origin for the fish fauna of the Arctic.

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