

SEALS OF THE PACK ICE

By DR. HARRY R. LILLIE

Around the seas of the far northern Atlantic coming under the influence of Arctic conditions lives, frequently on the wander, one of the most delightful of creatures, the harp seal or saddleback, *Phoca groenlandica*. Large communities migrate in the Newfoundland, Labrador, Baffin Land, Greenland sector; others through the area of Jan Mayen Island towards Spitzbergen. Gregarious for much of the time, they share their world of ice with the occasional bearded seal and ringed seal, walrus, and polar bear. The White Sea in northern European Russia is a great harp seal nursery, for an eastern community in the area of the Barents Sea.

The "harps", along with scattered "hoods" (or bladdernose seals), are persecuted by man who wants the fat of both pups and older seals for margarine, soap, and lubricants (the same uses as in whaling). Most of the skins go to the leather trade and the very young babies are slaughtered for the fur market.

With the Confederation of Provinces extended to include Newfoundland in 1949, Canada took over a large responsibility in this industry with which she had previously only slight connection, involving the annual spring hunt of the seals in the nurseries off the coasts of Newfoundland and southern Labrador. The departure of the sealing vessels from St. John's and the Newfoundland outports is a great yearly event, but behind all the cheering and flag-waving lies an industry which, for the cruelty and waste of its methods, has only been surpassed at sea by whaling. This sealing amid the ice floes has been written and talked about as a thrilling saga in which brave men and ships were lost almost every year. Such losses there certainly are, but in the past a considerable proportion of these appear to have been due to the scramble for the spoils and resulting carelessness on the part of skippers and men alike.

To Newfoundland in past years the word "conservation" has meant very little. Just as in so many other countries, her wild life has been wantonly depleted; and the seals have suffered grievously. The numbers taken were increased by vessels from Norway, and from Canada with United States interests. There was some respite for the seals during the war years, but in the year of Confederation nearly 300,000 seals were taken by a combined international fleet of about twenty-five vessels. In 1951 the catch rose to 400,000. Since then there has been some falling off due to a drop in the market price of

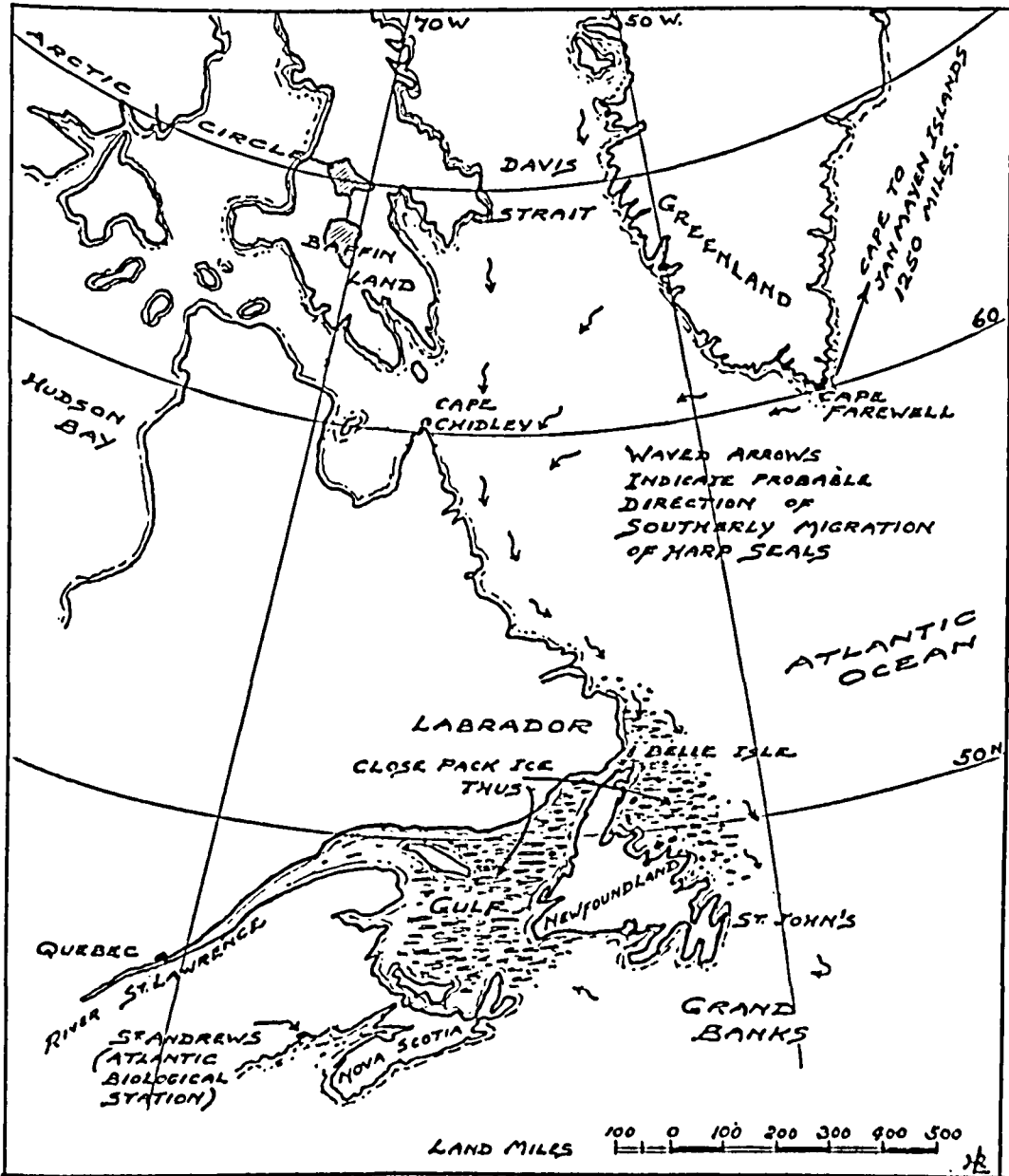
seal oil, but it is now a matter of urgency that adequate conservation measures should be adopted; this involves the countries of Denmark, Iceland, France, and the United States, as well as the main hunting participants, Canada and Norway.

The harp seal forms perhaps 98 per cent of the Newfoundland catch. As far as we know at the moment these herds spend the summer and autumn months, July to October, in far northern waters round Baffin Land and south-west Greenland. It is believed that most of them, other than the younger immatures, in the fall of the year migrate south, leaving the Davis Straits about November. Joined by some of the hood seals from east Greenland, the movement continues down the Labrador coast towards the Grand Banks to the south and east of Newfoundland. There is little knowledge of the extent of the area over which the seals scatter at this southern migration limit.

In January, with many seals passing close to shore, the people of Labrador, Newfoundland and the Canadian Gulf Coast, catch them in special large mesh nets, until the arrival of the drift ice or local freeze-up puts an end to it.

The "harp" grows to a length of between 5 and 6 feet, and the latest biological study suggests that reproductive age is not reached until at least the seventh year in the male and the fifth in the female. Although lean after the autumn, by February the seals are in good condition again and the time is drawing near for the pregnant females to have their pups. These make their way to the pack ice, coming down from the north with the Greenland current; they choose either the ice streams which are diverted through the strait of Belle Isle into the Gulf of St. Lawrence, or the main outer drift pack which extends a hundred miles or more off the east coast of southern Labrador and Newfoundland. By early March the seals are climbing out on the the big flat ice pans and giving birth to single 10 to 12 lb. babies, known as "Whitecoats"; named from the covering of soft creamy-white "wool" that they wear for the first three weeks of their lives; it is shed with the growth of the beautiful grey to blue-black mottled swim suit that replaces it. In the two to three weeks with its mother the youngster will grow to anything from 50 to 70 lb., when its 2-inch layer of fat beneath the skin, equivalent to a whale's blubber, is one object of the hunt. Killing of the babies in the first week after they are born, for the skins alone before the white coat begins to loosen, is hard on the mothers, while shooting nursing females in the nurseries or anywhere else is a vicious crime which is all too prevalent.

The much rarer hood seals, the adults growing to 7 feet in the female and 10 feet in the male, prefer more rugged ice to have their pups and are generally found only in isolated families not far from the harp areas. The beautiful coat of the baby



hood which, unlike the harp baby, he does not need to change, having already done so inside his mother, is slate-blue on the back and white below; it is much sought by furriers who, however, ruin its natural shades by dyeing. The parents fall easy prey to the sealers on the ice, as, differing from harp seals, they rarely leave the baby by itself at any time and never,

that I have known, in the face of attack. Although the main "hood" concentrations are along the lower eastern Greenland coast, like the "harps", their numbers are not well known. But they are relentlessly hunted in this Greenland area by vessels from Norway. The largest of all the North Atlantic seals, the bearded seal, sometimes called the square-flipper, may already be bordering on extinction.

The story of Newfoundland sealing starts around the year 1750 when the seals were caught in nets from shore during migration. Pelagic sealing began in the early nineteenth century and in 1857, 400 schooners went to the ice with 13,000 men, bringing back 500,000 seals, worth over a million dollars. The seal numbers then declined heavily. In 1863 steam-driven wooden vessels of about 300 tons, built in Dundee, Scotland, made their appearance in the Newfoundland area. Able to force their way through comparatively heavy ice, they could escape conditions which had meant the doom of many ships dependent on sail alone. The industry fluctuated through the latter part of last century and up to the depression year of 1932, when only four ships took part. The second World War almost obliterated the fleet and in 1943, for the first time in 150 years, there was no sealing. Motor vessels entered the industry in 1945 and in 1946 the Norwegian sealing ships came to the Newfoundland grounds. In 1948 Canadian vessels manned by Newfoundlanders appeared and although the price of seal fat went down and two of the motor ships were lost, that season brought in 300,000 dollars to the people of Newfoundland.

Also in 1948, Dr. John Olds, of Twillingate, in north-eastern Newfoundland, was surgeon and gunner with the sealing fleet on board the sealer *Clarenville*. There, in continuation of previous work he had done, he conducted a biological study of the seals and an investigation into the conditions of sealing. His report to the Newfoundland Fisheries Board was masterly. Specially built Norwegian vessels were then operating in the same area and in power, cleanliness and general efficiency were superior to the Newfoundland fleet. There was apparently little sound knowledge available amongst the sealers as to the true habits and behaviour of the seals, but it was evident that the main causes of mortality in the herds were, firstly, man, and secondly the upheavals of the ice in storms during the whelping season. Dr. Olds remarked upon the great waste of the carcasses and upon the numbers of babies killed far too young for anything but the skin to be of value. He proposed

that instead of being killed these youngsters should be marked with tags. This would give information about both the drift of the ice and the seals' own migratory movements. He also emphasized the wanton waste and cruelty in shooting the adult seals—one seal secured for every five bullets was considered quite normal. Had four of the shots been misses it would have mattered so much less, but poor marksmen, poor rifles, and possibly bad ammunition were causing unnecessary suffering. The Norwegian shooting was apparently better—three bullets per seal—but in general it meant that seals, as many as twice the number secured, were being lost wounded, most of which would die sooner or later.

North of Jan Mayen Island and towards Spitzbergen the other harp nurseries were invaded by the Norwegians and at a sealing conference in Norway in 1948, it was reported that the seals there were much reduced by the persecution. It was suggested that the taking of hoods at their particular area off south-east Greenland should be prohibited. But although it was agreed that control measures were urgent, apparently nothing was done.

In the spring of 1949, I took over from Dr. Olds for a season as fleet surgeon, to continue his studies and make a cine film of the sealing conditions. This was with the co-operation of the Conception Bay Sealing Company of Newfoundland, which fitted out the small motor vessel *Codroy* (Captain A. J. Gillett) as emergency medical ship and sealer. Later in the season one of Canada's Federal Department of Fisheries biologists, Mr. H. Dean Fisher, came out on another vessel, while Norway's biologist, Mr. Per Høst, continued work with the seals on which he had been engaged for many years.

It was the beginning of March, 1949, and at once on leaving St. John's, in Newfoundland, *Codroy* ran into a steady swell through an undulating carpet of slob ice (pounded-up bay and sea ice). This gave way to heavier Arctic stream ice as we went north, until constant bumps and shuddering made the writing of notes difficult, and the taking of ciné film while hanging on to the rigging of the foremast became precarious. Then came a brief call at one of the outports where our holds were loaded with rocks to give weight for forcing through heavy ice. Then we were off to the sealing grounds of the "Front", the ice-fields in the open Atlantic off the east and north-east of Newfoundland.

We butted on north, stopping once to shoot a solitary bed-

lamer harp seal for fresh food. The name bedlamer is given to seals of between one and five years old while they still have spotted markings and before they take on the dark brown harp-shaped saddle of the female, or the black saddle and face mask of the adult male. A barrelman, or scunner, in an improvised barrel or crowsnest up on the foremast, kept lookout for open patches or lanes in the ice that would make passage easier. Floe edges were often coloured brown by plankton forms. At night with our red and green navigation lights shining on the ice it was a strange and fascinating world.

We came up close to the old *Polarbjorn*, perhaps the most famous of all Norwegian sealers, which had been a scientific expedition ship on many Greenland investigations. They asked us if we had seen any seals that day, and in the midst of our replying that we had not, up popped a harp seal in the water between the ships and remained inspecting us while we completed the conversation. Little did we imagine as we went on our way that *Polarbjorn* was soon to be lost with all her crew.

A short spell of more open water, then lanes that led into heavy rafted pack-ice, the engine room telegraph ringing constantly for stop, astern or full ahead. That night a north-east wind closed the ice firmly, making useless any further attempt to move and for a time we had just to accompany the southward drift of the whole ice expanse. Forty-three men in a tiny but tough wooden shell 124 feet long, built of fir, the bows strengthened with greenheart and steel plating. We were helpless, in a world of white ice to the horizon in all directions with only the occasional creaking of the floes to remind us that the depths of the Atlantic lay below. To the east, two other Newfoundlanders *Wimoda* and *Linda May* were in the same state.

After a local easing of ice pressure the men went out over the side to shoot harp and hood seals swimming in a swatch (open lead of water) not far away. It was senseless destruction, for the dog hoods sank when killed and could not be recovered, while the harp and hood bitches were pregnant and the unborn pups almost valueless. A seal pushing up through a blowhole close to the ship tried to climb out, but with a bullet through the head from the bridge, slid back leaving blood spattered over the snow. It was a mean act and it seemed certain that "bad luck" would follow the ship if that sort of thing continued, and so it proved. That night again one of our so-called marksmen shot four seals, securing just one of them. Rifles in the hands of such men may ultimately put an end to the

industry. The seal is not long sighted and is so inquisitive that he will often swim right up towards the dangerous human animal. In the past, before the era of the rifle, the Eskimo was reputed to make sure of any seal he chased, for his life and that of his family depended on it and every part of the carcass was utilized. How constantly Dr. Grenfell, of Labrador, deplored the commercial killing, although his main concern was for the Coast Eskimos, who apparently depended to some extent on the harps when the more solitary ringed seals were scarce. To-day the Eskimo has learned some of the evil ways of this species known as civilized man, and together they are the cause of animals such as the walrus being brought in danger of extermination.

By the 21st March we had still not reached any patch of whitecoats and the men were quite ready to believe in the bad luck brought on by our own actions. Then a grinding swell from the open Atlantic penetrated the pack enough to drive heavy floes against us. For the next two nights we turned out of our bunks at intervals to break up the heavy ice-pans with gunpowder charges in tins and bottles, to relieve the pressure and the battering on our sides.

Ultimately with a loosening of the ice we were on the move again, and at last after dark on the 24th March we could hear whitecoat babies bawling ahead of us. A sound rather like young lambs, but a shorter cry and higher pitched, at times more like the cry of baby rooks. Everyone on board was keyed up.

Breakfast in the dark and at dawn the killing crews went over the side, fanning out over the ice, with their towing ropes for the pelts hung round them. They were armed with skinning knives and 5-ft. dogwood gaffs, poles roughly cut, shod with spike hooks at one end, and used for negotiating the ice as well as for clubbing the young seals. Early that evening we had 500 pelts on board (the skins with the thick fat layer attached), and many more coming in; and our lovely white world around was splashed with blood and scattered with the small flayed carcasses.

In general the killing of the whitecoats is humanely done, but on occasions I noticed that one or two of the younger men instead of doing it properly by a blow on the skull, just dazed them with a kick before cutting the small bodies out of the pelts. This was partly the result of an old hand in authority shouting to the men not to hit too hard or splintered bone would blunt their skinning knives. And it was pitiful to see one

mother climb back on the ice and wonder why a little bleeding mess of meat and bone could not suck from her. I later saw one man try to outsmart the others by an attempt to drive a towing hook through a whitecoat's jaw without first killing it, with the idea that he could knock it out and fasten on to it in one blow. It was a revolting failure as a demonstration of his prowess ; and I'm afraid that when he came to me later to have a tooth extracted, I was not too particular about the painlessness of that operation. He understood the situation better after that.

Days then were spent with ciné and other cameras strapped on, jumping ice pans, and with the ocean swell not always was footing safe. Many times I subsided into the icy water. My first bath, and nearly my last, came from being in a hurry to get a picture. I stepped on what appeared to be a good flat pan, but was really just a thick slush of ice porridge with a smooth covering of fresh snow. Trying to raise one leg from the sea, below the 2 ft. thickness of this porridge, only pulled me down deeper, and to flatten myself out in it and roll over to grab solid edge was the only way. When my pulse had returned to normal and I got back to *Codroy* the skipper said that looking out from the barrel he thought I was just playing at seals ; I nearly was, permanently. Men should always go in pairs when away from the ship. It is a big risk alone especially with the ice on the move and they should be at least within calling distance of each other. The first thought in such wettings had always to be the saving of the cameras and fortunately only one of three later came to grief. Then one morning a harp seal, while being chased close to me, was caught by two ice pans as they closed in a swell and burst like a ripe tomato. I was more careful than ever after that. In this work, often miles away from the ship, an occasional drink of raw seal's blood and eating a heart raw seemed the most sustaining food available. It is the Eskimo way.

Killing went on steadily now, the pelts being piled on pans with marker flags, but haze could quickly make them difficult to see from the ship. In good weather " blood markers " could be used, just a seal carcass or two laid over an ice hummock beside the pelts. But there was always a risk of missing them, especially with a snowfall.

A good skipper will always stop killing in ample time to allow of all pelts being loaded on the ship before dark ; for the sealing master who loses them by fog, or because of bad weather breaking up the ice, is just stealing from another man who could have

secured them. Long before sealing was known in its present form in Newfoundland, the old sealing masters of Scotland prosecuted the fishery under unwritten rules. In those days apparently, a man who panned more pelts than he could load in time threw away his chances of getting a boat another year; for no matter how big the load of seals with which he returned home, he had done more damage than he was worth and was considered in the same category as a dog that worried sheep. Yet now, by radio from St. John's, reports came constantly of sealing vessels with thousands of pelts left out on the ice and sustaining heavy losses; but I do not think Captain Gillett lost a single one in this way.

The youngsters, many of them now about three weeks old, were shedding their white coats, becoming so-called "Ragged jackets" in the process. More and more of them, deserted by their mothers, just rolled and twisted about on their backs and sides to get rid of the loosening hairs. With their new coats they would be known as "beaters", learning to fend for themselves. About May they would be starting to migrate back, as far as we know, to where their mothers had started from in the far north. But they seem to put off as long as possible the first dip into the water and fall a prey to the sealers as a result. For weeks they eat nothing, the 40 per cent or more fat and 10 per cent protein in their mothers' milk having given them ample reserves. But with their fat used up at length in body building and fuel, they become smaller than they were, until they begin eating small plankton crustacea, graduating to surface-swimming fish. As adults they go down to over 150 fathoms after fish feeding on the bottom.

On the 28th March, the first Newfoundland vessel with a full load was headed for St. John's, with shore radio giving out congratulations to her and her gallant crew. How many of those cheering her in would give a single thought to what lay behind it all?

Friday, the 1st April, 1949—Newfoundland was now part of Canada. It was raining heavily and we were fast in the ice. Later a shift in the wind released us and we turned south again, shooting a hood family on the way. Then as we passed through more open pack, a shot from the bridge badly wounded a bed-lamer. But we just went on and left it, and the day following paid the just penalty by seeing no seals at all. Later, not far from the Norwegian *Heroyfjord* we could see one or two of her crew dragging still writhing baby seals across the ice with towing hooks; the struggling probably reflex action, but significant

of the whole scrambling atmosphere of the hunt. It seemed to be not sealing but seal mining, with little advance in thought over the last hundred years; and the picture would probably be the same for the areas of Greenland, Jan Mayen, and Spitzbergen.

By the 9th April the whitecoats were gone and our attention turned to the older seals gathering together on the pans to mate again and moult prior to the north migration. The mothers early become pregnant once more, for in seals, with almost a year of gestation, they are served again only a short time after the pups are born.

The ice was beginning to get rotten and these adults and bedlamers difficult to approach. So rifles were brought out again. It was the saddest exhibition of all, of inefficiency, waste, and cruelty. Although some of the men were reasonably accurate with these weapons, instead of stalking to within clean killing range they so often felt eyes from the ship's lookout barrel on them and competed with each other to see who could shoot first, firing as soon as the animals became restive and from far too long a range. The result was tragic; some of the seals died at once, others, shot through the neck or lungs, writhed until they flopped over the edge of the ice into the water. I saw as many as five seals go off from one single pan leaving trails of blood; and as I followed with the cameras behind the gunners, other seals lay in pools of more blood, while one, with its upper jaw blown away, turned on us still defiant. Yet so much of it was pure lack of any thought at all, the men taking for granted what their fathers and grandfathers had done with probably the same lack of thought.

By mid-April, with 10,000 pelts on board, we were headed for port when we got news of the loss of *Polarbjorn* by fire. Shortly afterwards *Wimoda* was crushed to total loss by heavy rafting ice close to Belle Isle, her crew escaping. But worse was to come. Late one night I had picked my way over the ice in the half-dark to attend the crew of *Heroyffjord* as she lay not far from us; and negotiating the floes back to *Codroy*, I took with me thoughts of some of the fine men I had just left under their skipper, Captain Jacobsen, of Tromsø. Men who surprised me by their thoughts of conservation, and who had made up their minds to make themselves heard in Norway on the abuses of sealing. When *Polarbjorn* caught fire her crew escaped on to the ice and were picked up by the Canadian *Illinois*; later they were transferred to *Heroyffjord*, which then set out for home. Caught in heavy seas, her load of seal fat and skins may have shifted;

she foundered with the loss of both crews. Are some of us superstitious as we call it? Perhaps, and possibly with some good reason. If there is to be justice against wanton destruction and cruelty, then in the sealing industry there will continue to be retribution by the loss of ships and men for as long as we behave as we do. But why had it to be the men of *Polarbjorn* and *Heroyfjord*?

The harp seal problem is in two main parts: the conservation of the stock and the methods of killing. In the first half of last century the better years each produced from Newfoundland anything from three to seven hundred thousand seals. Three to five hundred thousand continue to be obtained yearly and it has been suggested that the size of the herds still appearing off Newfoundland indicate that there is no depletion of the stocks. This may well be a dangerous theory. Nansen believed there might be an extensive and unknown breeding ground of hood seals in the Davis Strait, while Stefansson thought the same about a reservoir of harp seals in the Baffin Land area, from which the greater proportion did not come south. It is possible that the yearly destruction of the harps on our sealing grounds has so far been made up at the expense of steady depletion of such a reservoir; while Norwegian biologist Per Høst believed that this source might be less than 10 per cent of what it once was. If so, we may before long find a sudden drop in the numbers of seals appearing in the Newfoundland area, which would be a danger signal calling for cessation of sealing. With increased sealing activity in the Arctic generally, international control is very urgent.

At present the flayed seal carcasses are left on the ice or thrown in the sea; not complete waste, as they are eaten by other creatures or are broken down for the multiplication of plankton, but in addition to oil lost in the bony skeletons, 1,200 to 1,500 tons of edible meat is lost to the industry in the Newfoundland area alone. If this could be avoided, only two-thirds of the present catch of seals would be needed for the same return as in past years. The meat is strong flavoured but rich in food value. Investigation has shown that there would be little practical difficulty in getting a small refrigerator ship to accompany the sealers to handle the carcasses that would then be collected by each vessel. One St. John's company has already tried to save these carcasses, but found that in the competitive scramble, satisfactory co-operation from the men could not be obtained without joint action by all ships.

On the methods of killing, it would seem that all men taking part in the hunt will have to be licensed and any of cruel or callous behaviour banned from the ice. Almost invariably the men most at fault are those who cannot stand pain themselves: so often those whose tales of prowess relate to the killing of old dog hood seals, so-called ferocious animals but almost helpless on ice, yet which do their best to defend their mates and young against hopeless odds. Uncontrolled killing and panning of the pelts, with the indiscriminate shooting of pregnant and other adult seals, for which up to now the owners and skippers must take the blame, will have to stop. The use of rifles might well be prohibited altogether as at one time it was, but if in any special circumstances shooting is permitted, it must be done only by men qualified both as marksmen and stalkers.

The results of the 1949 expedition described I discussed with representatives of the owners in St. John's and other sealing captains. I was greatly encouraged by the outlook of these skippers. More of them than I expected agreed that something would have to be done to better the industry. Even before Confederation, some thought had apparently been given to an aerial survey of the seal herds, although little had come of it. But now, back in Ottawa, the Federal Department of Fisheries was aware of the need to start such a survey. Then as soon as possible there would have to be an international discussion between representatives of Canada, Denmark, France, Iceland, Norway, the United Kingdom and the United States, to establish control of the number of seals taken, fix dates for opening and closing the season and decide on permissible methods of killing. It could be on the same lines as that already in operation in whaling, but avoiding the domination by financial and national interests which has always hampered proper conservation in that industry. Although a great part of Newfoundland sealing takes place outside territorial waters, the matter is primarily of concern to Canada. Norway, then reported to be ready and waiting for Canada to take the initiative in international discussion, has, since 1926, had a permanent Sealing Commission acting in an advisory capacity, considering mainly the problems of the areas of Jan Mayen, Spitzbergen and the White Sea: although the present Soviet Government has in recent years objected to any foreign activity in the White Sea.

Later in 1949 the Department of Fisheries held a meeting with

the Newfoundland sealing companies; when, in view of a likely reduction in the fishery due to a fall in oil prices and the absence of reasonably accurate knowledge of the numbers of seals involved, it was decided that restrictive measures should be postponed while biological investigation went ahead. By 1950 a photographic aerial survey of the herds was under way, carried out at the time when the pups were at the stage of all being on the ice. The adults and immature seals, of course, could not be expected to oblige by congregating to have their photographs taken, but the ratio of pups to adults was estimated partly by examination of seals netted from shore over a period of years, giving the proportion of adult females pregnant. The gatherings of moulting seals on the ice later in the spring season are mainly of adults and older immatures. Analysis of the ages of those secured, along with the ratio of the immatures to adults, has given an idea of the mortality rate through the years from birth.

From this research there appeared to be in the spring season approximately a million seals of all ages in the Gulf of St. Lawrence and two million on the Atlantic front, with the possibility of many more in scattered groups not yet estimated. It is a promising number but giving no cause for complacency, and the increasing destruction of the adults is indeed disturbing.

The migration cannot be followed by aircraft survey, so a programme of putting tag marks on the live babies, attached to such parts as the web of the scudders (hind flippers) has also been going ahead. Dr. Fisher of the Canadian Atlantic Biological Station reports that approximately 1,300 pups have been tagged in the period from 1950-54, using commercial sealing vessels, 60 per cent of these pups escaping the general slaughter to provide recaptures from as far as West Greenland and Baffin Land. But he stresses the need for marking to be on the greatly increased scale of a thousand or more yearly.

In Canada we have a Federal Department of Fisheries that is looking ahead. Perhaps sooner than we think, sound sealing regulations will be in operation and the voices of the white-coats will still be heard across the ice fields by future and more kindly generations of mankind.

BIBLIOGRAPHY

- SIVERTSEN, ERLING. *Biology of the Harp Seal*. Publications of the Norwegian Whaling Council, 1941.
- Chafe's Sealing Book* (Statistics over the past century and more, kept in St. John's). At present out of print.

- COLEMAN. The Present State of the Newfoundland Seal Fishery. *Journal of Animal Ecology*, No. VI. Brit. Ecol. Soc., 1937.
- The Newfoundland Seal Fishery and the Second World War. *Journal of Animal Ecology*, May, 1949.
- LILLIE. Waste and Cruelty of Present Sealing Methods. *St. John's Daily News*, 21st May, 1949.
- With Whales and Seals. *British Medical Journal*, 24th December, 1949.
- FISHER, H. D. Harp Seals of the North-west Atlantic. Fisheries Research Board of Canada, September, 1952.
- FISHER and SERGEANT. A review of the Harp Seal Problem (Summary of results of research from 1949–1954, by the Federal Department of Fisheries of Canada).
-