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Historical Perspectives

Sidney Holt

(born 1926)

Brief Biography

Sidney Holt, D.Sc., is an English marine biologist educated at the University of Reading, England, and now resident of Umbria, Italy. From 1946 to 1953, Dr. Holt was engaged in research at the Fisheries Laboratory at Lowestoft, England, and The Nature Conservancy in Edinburgh, Scotland. He was co-author with R. J. H. Beverton FRS of a book titled *On the Dynamics of Exploited Fish Populations*, first published in 1957, which has since produced three more editions. Holt's peers describe this text as "the most widely cited fisheries book ever published . . . a great work (that) created a solid foundation for one of the two major global visions of the science of fisheries. This book was the genesis of the modern age-structured approach to the optimal management of fishery resources. Beverton and Holt will continue to be a source of inspiration and insight for many years to come."

For 25 years, from 1954, Dr Holt was employed in United Nations organisations, having been appointed at various times as Director of the Fisheries Resources and Operations Division of the Food and Agriculture Organisation (FAO) of the UN (in Rome), Secretary of the Intergovernmental Oceanographic Commission (IOC), and Director of UNESCO's Marine Sciences Division in Paris. He has held professorial chairs at the Universities of California at Santa Cruz, of Rhode Island, and of Malta; and a Senior Overseas Fellowship at St John's College, Cambridge. In Malta, Holt served as UN Advisor on Mediterranean Marine Affairs and was one of the founders and the first Director of the International Ocean Institute (IOI) there. From 1973 until 1978, Holt was in charge of the United Nations Environment Programme (UNEP)-FAO Marine Mammals Project, set up as an outcome of the UN Conference on the Human Environment (UNCHE) in Stockholm in 1972.

Holt became engaged with the conservation of marine mammals in 1960 while he was with the FAO. Since his retirement from the United Nations system in 1979, he devoted his energy mainly to the conservation and protection of the great whales. He served on the International Whaling Commission's (IWC) Committee of Three scientists, 1960 to 1965; on the delegation of the Republic of Seychelles to the IWC, 1979 to 1987; as adviser to the Government of France, 1992 to 1994, and to the Delegations of Italy and Chile to the IWC; and also as Science Adviser to the International Fund for Animal Welfare (IFAW) since 1980. He participated in various capacities for more than 30 years in the Scientific Committee of the IWC, as well as in the Commission itself, from 1959 to 2002. Holt was closely involved in three important decisions by the IWC: designation of the Indian and Southern Oceans as whale sanctuaries, the 1982 general moratorium on commercial whaling, and the preceding moratoria on pelagic whaling and on the hunting of sperm whales.

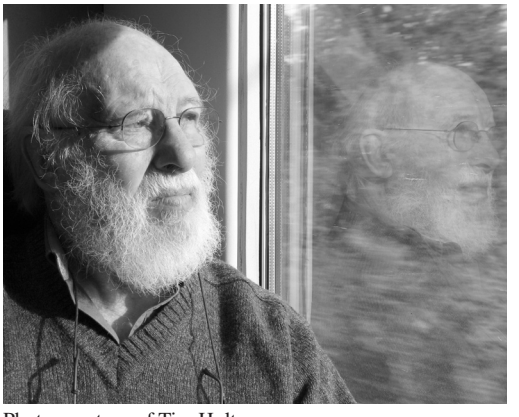

Photo courtesy of Tim Holt

Holt has been honored with the Gold Medal of the World Wildlife Fund (WWF), the Royal Netherlands Golden Ark, UNEP's Global 500 Award, and The Blue Planet Award of the IFAW, all for contributions to the protection of marine mammals, to animal welfare, and to fisheries science.

His several hundred scientific papers; chapters of books; letters to Editors of scholarly journals, magazines, and newspapers; and working briefs for a number of organizations on a variety of subjects reflect the breadth of those activities as well as his efforts to convey scientific and political ideas to a wider readership interested in wildlife, conservation, management of resource use, marine science, and ocean-related political affairs.

Science, Politics, and Economics in the International Whaling Commission

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I am writing this article immediately after sending the manuscript of a book to my publisher, which is an autobiographical account of 50 years of work on the conservation of whales, mainly through the International Whaling Commission (IWC). So, this article will inevitably reflect, even be something like a synopsis of, that book, which is entitled *Save the Whale!: Memoirs of a Whale-Hugger* (Trolley Books, London, June 2012). Professionally, I am a scientist and so will write about that aspect of whale-saving, but I admit that in reality the economic and political issues are probably more important. Thus, I shall try to cast some light on those topics, also, from my experience. As a scientist, I also have limited "expertise"; my field of research is the numbers game—population dynamics. Since I began work, other disciplines in biology have become relatively more important, I think: behavioural studies, ecology, and perhaps genetics, disciplines in which I also claim no particular expertise. I think I should say right now that it has been my experience, at least for most of those 50 years, that scientists have usually been the leaders in pressing for conservation and especially for human uses of whales to be regulated so as to be biologically sustainable, with an eye always on the interests of the next generations of humans.

The IWC was the first of the numerous post-World War II intergovernmental organizations created to regulate international fisheries and, in most cases, to engage in the conduct of relevant scientific research or at least in assembling, evaluating, and applying the results of such research in management. The IWC was created in 1949 as the *International Convention for the Regulation of Whaling* (*ICRW*) *1946* came into force. This was based on a draft submitted by the U.S. government that included many of the provisions in a series of international agreements on whaling that had been adopted by whaling companies and governments in the 1930s. The *ICRW* contains two specific provisions regarding research. Its Article V authorizes the IWC to adopt regulations "with respect to the conservation and utilization of whale resources." This it may do by amending what is called The Schedule to the Convention. The Schedule is an integral part of the Convention and is the only part that can be modified by the IWC, by qualified voting; the main body of the Convention can only be changed by a diplomatic process involving all Parties to the *ICRW*. Proposed Schedule amendments are subject to the approval of at least three-fourths of the Member States participating in a meeting and voting. The second paragraph of Article V contains the requirement—among others—that "amendments to the Schedule . . . **shall be based on scientific findings**."

The second provision of the *ICRW* concerning science is its Article VIII. It is important to understand that this Article is one of those in the *ICRW* that has practically nothing to do with the IWC. It opens with the provision that "Notwithstanding anything contained in the Convention [including the Schedule *sjh*] any contracting government may grant to any of its nationals a special permit authorizing that national to kill, take and treat whales **for purposes of scientific research** . . . ." The inclusion of this Article was insisted upon at the 1946 conference by the delegation of the United States. Animals killed under such permits were, in the early years of the IWC, referred to as *scientific whales*, and the catching of substantial numbers of whales under special permits has been called *scientific whaling*, although neither of those terms appears in the IWC's documentation except occasionally in the Verbatim Records of Plenary Sessions of its meetings.

Article III.4 of the *ICRW* provides that the IWC "may set up from among its own members and experts and advisers such committees as it considers desirable to perform such functions as it may authorize." At its first meeting, the IWC created an *ad hoc* Scientific Committee, which consisted of the senior scientists of the national delegations. In the early years, advice to the Commission was formulated by those more junior "working" scientists who were available on the delegations, assembled as a Scientific Sub-Committee. Over time, this group disappeared, replaced by an expanding Scientific Committee, working through numerous Sub-Committees and Working Groups. The Committee members were, naturally, all members of delegations and appointed by their national authorities, though not necessarily all government employees. From 1960, a few scientists from

outside the delegations were appointed to assist in formulating specific advice, following which assessments of whale stocks were undertaken by the Food and Agriculture Organisation (FAO) of the United Nations with results fed to the Commission through the Scientific Committee. Subsequently, the new practice was established of engaging "invited participants" to participate in their personal capacities in the Committee but not as full members of it. They were, and in principle still are, not permitted to participate directly in formulating the Committee's advice to the Commission for regulatory action.

Article V.1 of the *ICRW* has a **closed** list of the kinds of regulation that may be enacted through amendments to the Schedule. These are as follows:

- Fixing protected and unprotected species
- Fixing open and closed seasons
- Fixing open and closed waters, including the designation of sanctuary areas
- Fixing size limits for each species
- Fixing time, method, and intensity of whaling (including the maximum catch of whales to be taken in any one season)
- Fixing types and specifications of gear, apparatus and appliances which may be used
- Fixing methods of measurement
- Requiring catch returns and other statistical and biological records

Although the scientific aspects of these actions were not specified, it soon became evident that scientific advice would be called for, some time, one way or another, concerning all of them. It was also evident that any scientific advice on these matters had to pay due attention to the purpose of the *ICRW* as defined in its Preamble: "to provide for the proper conservation of whale stocks and **thus make possible** the orderly development of the whaling industry [emphasis added]." There is a common misunderstanding of this purpose; it is **not** the role of the IWC to **ensure** the orderly development of the industry—that is the function of governments and operators. *Task* as defined in the *ICRW 1946* is to make that possible by ensuring conservation. *Conservation* is not formally defined but its intended meaning is clear from other phrases in the Preamble. The *ICRW 1946* asserts that all nations of the world have an interest in safeguarding the stocks of whales for future generations. Then, "it is essential to protect all species of whales from further over-fishing," and "it is in the common interest to achieve the optimum level of whale stocks as rapidly as possible without causing widespread economic and nutritional distress" and "recognizing that in the course of achieving these objectives, whaling operations should be confined to those species best able to withstand exploitation in order to give an interval for recovery for certain species of whales now depleted in numbers."

When the 1946 diplomatic conference negotiated the *ICRW*, it agreed on an initial version of the Schedule. The items in the initial Schedule relating to Article V.1 involved the few scientists who were members of the negotiating delegations. Representatives of 15 states participated in the 1946 conference, but few of them had scientists on their delegations. Some of the initial Schedule provisions applied to all whaling in all regions by both pelagic factory-ship operations and from land stations. Other provisions were concerned with a particular type and location of whaling and gave attention in particular to pelagic whaling for baleen whales in the Antarctic (defined as the waters south of 40º S latitude) using *expeditions*. These expeditions were each comprised of a *factory ship*; numerous accompanying *catcher boats*; and usually some *auxiliaries* for *scouting*, carrying extra fuel supplies, and transporting products back to home bases in the northern hemisphere in midseason.

In the original Schedule, an annual catch limit was set for catches of baleen whales in the Antarctic by pelagic operations. This was defined in Blue Whale Units (BWUs), which were based on relative yields of edible whale oil; thus, one blue whale equaled two fin whales or two and a half humpbacks or six sei whales (or the similar Bryde's whale). The starting number was 16,000 BWUs/y, which was a completely arbitrary choice and was the equivalent of about two-thirds of the pre-WWII catches. After the IWC began to function in 1949, the scientists asked every year for 15 years that the BWU catch limit be reduced; that catch limits be set by species, applied also to land-station catches in the Southern Hemisphere; and that they be broken down by regions. The Commission regularly rejected all those recommendations at its annual meetings. It will probably surprise no one familiar with IWC history when I write that the Annual Chairman's Reports and the Verbatim Records of Plenary sessions show that it was the delegation of Japan that almost invariably took the lead in opposing such innovations, often by saying that they posed insurmountable operational difficulties. During that period, catch-rates (numbers per catcher-day) of all species steadily fell, and the average sizes (lengths) of all species also shortened.

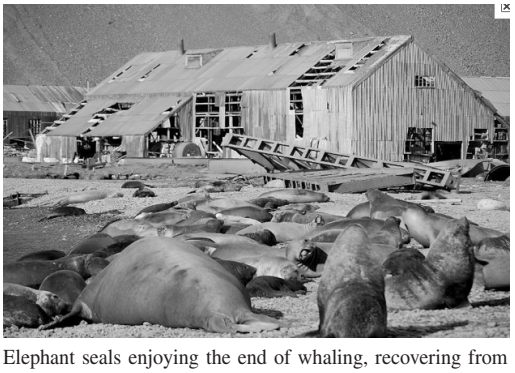
Mostly, expeditions from six countries participated in the Antarctic pelagic operations: Norway, the United Kingdom (UK), Japan, The Netherlands, Union of Soviet Socialist Republics (USSR), and also one expedition that was flying the convenience flag of Panama but in reality was a U.S. operation manned by Germans. The "Panamanian" vessel

ignored the BWU limit, while the other five countries (all but The Netherlands each with several expeditions) raced for the biggest possible "share" of the overall catch limit in what came to be called "The Whaling Olympics." Through the 1950s and early 1960s, the big four (in sequence, Norway—UK—Japan—USSR) invested in expensive new, larger factory ships and upgraded faster and more powerful catcher boats. It was known that there was considerable cheating going on with respect to statistical reporting, especially by the USSR and Japan, and nearly everyone was falsifying measures of caught animal lengths close to the established minimum size limits. Again, most of these massive infractions of regulations were revealed by scientists who had been working on the whaling operations. By 1960, there was pressure to negotiate shares of the overall Antarctic catch, to reduce destructive competition, and to appoint international as well as the existing national inspectors/observers on all the factory ships. And in 1960, it was decided to apply, by 1964 at the latest, the new methods of population dynamics, following the fisheries model, to calculate reduced and—hopefully—sustainable catch limits. The 1964 deadline was not met, mainly because Japan reneged on the 1960 "deal" primarily because, like The Netherlands, it needed large catches to pay off bank loans, though it always insisted that the whale stocks were not in such a bad state as most scientists thought.

Eventually, a share system was negotiated outside the IWC, and the national shares became negotiable currency attached to the factory ships. This suited the UK especially because its main company had already decided there was no future in Antarctic whaling and the shares meant it could exact a higher price for its ships when they came, in time, to be sold to Japan—as were, later, some of the Norwegian factory ships and The Netherlands only factory ship. The agreement on shares had a devastating effect on the application of science. In theory, the Scientific Committee of the IWC calculated a sustainable yield each year that could then be divided among the five states. In reality, the five governments negotiated what they thought they needed to pay debts and make some profit, and the Commission could practically only give them a number close to their total. Otherwise, the whaling countries would simply use their power to "object" to the Commission's decisions. The International Observer scheme came into effect only when most species had been depleted close to extinction, towards the end of the 1960s. During that period, pelagic catch limits for baleen whales were negotiated for the North Pacific. The four big coastal states—Canada, Japan, the U.S., and USSR—decided they would negotiate these limits between themselves and merely inform the IWC of the outcome; the end result was just the same as in the Antarctic.

As to science, the 1950s saw the beginning of a twofold practice that continues to this day, but especially involves Japan and Norway: on the one hand, although scientific advice on regulation is expected to be provided by the Scientific Committee, those two whaling countries will often act only in accordance with advice from their own scientists—and, remember, the Scientific Committee is composed of members designated by Governments and participating in their delegations to the Commission. On the other hand, Japan, in particular, regularly insisted that conservation actions could only be taken if they were recommended by the Scientific Committee. But the Committee does not vote, and, given its composition and structure, consensus is extremely rare.

A wider public began to get interested in the messy whaling issue in the late 1960s, and this led to the United Nations, in 1972, calling on the IWC to declare a ten-year moratorium on commercial



Elephant seals enjoying the end of whaling, recovering from their own near extermination by early 20th century seal hunters; they are seen here reclining near a derelict whaling station at Stromness on South Georgia. (Google Images)

Derelict British catcher boats near the Grytviken station (Google Images)

whaling. Two of the Antarctic pelagic nations—the UK and Norway—went along with this primarily U.S. idea; they were getting out of the business anyway. But the IWC as a whole rejected it, being encouraged by the reactionary position taken by most of the scientists who said they had been pressing for species catch limits and what they called *a blanket moratorium* was contrary to that, and anyway, they thought they needed data coming from whaling operations and catches for assessment purposes. In 1974, a compromise proposed by Australia (which was still a whaling country) was adopted: catch limits by numbers of each species in designated *management areas* would be set each year, at levels a bit less than what the scientists determined to be sustainable, except that the limits would be set to zero if a management stock was assessed to have been reduced already by whaling to below roughly one half of its original number—that is, the number before modern industrial whaling began. Application of this New Management Procedure (NMP), from 1976, led quickly to all the baleen whales, except the minke, that feed in the Antarctic becoming protected, but for technical reasons (especially the inadequacy of basic data and short data-series), the NMP was not useful with respect to most land-station whaling, especially in the Northern Hemisphere. Catch limits came to be set pseudo-scientifically at a bit less than previous average catches on the grounds that no declines in stock had been detected in the sparse data. And the NMP was not biologically applicable to the sperm whale, a species the catches of which had been increasing enormously as baleen whales declined, helped by the strategic (military and industrial) interest of a few countries in the inedible sperm whale oil.

In 1974, it had been decided that catch limits would, as in fisheries management, be set in terms of weight of catch, not numbers, but that idea was abandoned because it would mean setting even lower whaling-mortality rates. The IWC is prohibited from setting catch limits or making other regulations that apply specifically to countries or whaling stations or expeditions. As we have seen, with respect to pelagic whaling, this could be circumvented only by negotiations outside the IWC. But with respect to land stations, it was largely achieved by another pseudo-scientific device—designating convenient boundaries to management areas, which were supposedly, but with minimal evidence, marking the ranges of subpopulations of each species. This was justified by the valid argument that if catch limits were set for large regions, whalers would concentrate on the places where whales were most abundant and that could endanger subpopulations if such existed.

By the end of the 1970s, it was obvious that if the whales were to be "saved," new approaches were needed. In 1979, a proposal by the "new boy," the Republic of Seychelles, to declare the Indian Ocean as a sanctuary and off-limits to commercial whaling was adopted by the IWC. As with the earlier moratorium proposals, the Scientific Committee was sharply divided; some members tried to insist that a sanctuary declaration should be treated as a scientific experiment to compare what happened to the whales inside it with those outside it. Again, we heard the complaint that such a declaration would halt the flow of data, but the Commission as a whole was clear—designating sanctuaries was not a scientific experiment but a conservation measure. In fact, the Eastern Pacific sector of the Southern Ocean had been designated as a sanctuary for baleen whales in 1946 and served that purpose until it was abolished in 1955 on the pretext that allowing pelagic whaling there would take the heat off the rest of the Antarctic.

Also in 1979, an indefinite moratorium was decided on all pelagic whaling except for minke whales; it applied also to a new class of mini-factory-catcher invented for Norwegian whaling throughout the North Atlantic and adopted by some Japanese coastal whalers and, importantly, by numerous "pirate whalers" that were operating to supply frozen whale meat to the Japanese market, which thirsted for alternative sources of supply as the Antarctic and North Pacific catches declined. Then, in 1981, a moratorium on sperm whaling (for any purpose and by any means) of indefinite duration was declared; and in 1982, a general moratorium of unlimited duration on all commercial whaling was decided, coming into effect in 1986. By then, more of the scientists—at least those from the majority of non-whaling countries—had come to accept the moratorium

A so-called "small-type" Norwegian pelagic factory-catcher in the North Atlantic, with a minke whale across its deck. This "small-type" whaling is misleading. It is not some benign operation using small boats; rather, it is a highly mechanised large operation catching what are laughingly called "small whales" such as the nine-ton minke. (Photo used with permission from Greenpeace International)

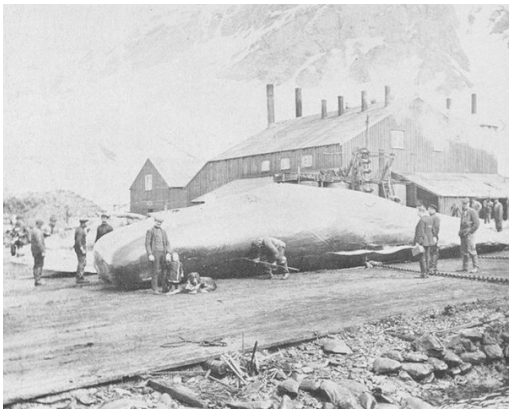
idea; they had realized that the data coming from whaling operations were practically useless for stock assessment purposes and also that data for making reliable assessments of sustainability were woefully inadequate. Generally, valid assessments could only be made when stocks had already been seriously depleted. This realization set off, within a couple of years of the moratorium, the process that led to scientists spending several years in intensive invention and testing of new ideas for managing commercial whaling. At the same time, scientific interest became focused on counting whales by systematic, planned sighting surveys, and it still is (supplemented by the new techniques of individual recognition, a sort of natural tagging; skin biopsies from living whales; and tags that can be tracked by satellites). Still, it is noteworthy that after a quarter century of extensive, intensive, and expensive sighting surveys in the Antarctic, scientists still have not agreed, at the time of this writing, even roughly, on how many minke whales gather to feed in that region every summer.

After 1986, all whaling countries ceased commercial operations except Japan, the USSR (after a couple of years), Norway—now confining itself to the Northeast Atlantic—and, temporarily, Iceland. Norway continued under its objections both to the moratorium and to the zero catch limit set for the Northeast Atlantic minke whales in 1985 because they were—and still are—depleted. Iceland did not object to the moratorium but engaged for a while in whaling under permits awarded to itself under Article VIII of the *ICRW*. Japan at first objected to the moratorium, then withdrew its objection as the result of a deal made with the U.S. allowing its fishermen to operate under license in U.S. Pacific waters, then that deal fell apart. But Japan had already prepared to continue minke whaling in the Antarctic under Article VIII special permits, which it is still doing on an increasing scale and now with occasional catches of other, larger species, especially the fin whale.

Now is the place to say something more about so-called "scientific whaling." Article VIII of the *ICRW* took up a similar provision in pre-WWII whaling agreements and for the same reasons. It met the desire of some governments to be able to allow limited killing for strictly scientific purposes of Protected Species (right and grey whales) and stages of other species that had been generally protected—small immature individuals; calves and their nursing mothers; as well as whales in places off-limits, especially to factory ships (essentially the Tropics and Subtropics) and outside designated whaling seasons. When there were no species catch limits, the special provision served a very limited purpose. This changed with the introduction of the NMP in 1975-1976. As whales accessible to pelagic operations in high latitudes declined, Japan's whaling interests began to look at baleen whales—especially the hitherto unimportant Bryde's whale (similar to and confused by whalers with the sei whale, which itself feeds in lower latitudes than the blue, fin, and minke whales) in warmer waters. As pelagic operations had long been banned in the warmer regions of the globe where they mostly lived, Bryde's whales could be taken only by issuing special permits. In 1977 to 1979, a Japanese pelagic expedition hunted Bryde's whales south of Madagascar, off the Philippines, and around the Solomon Islands, securing at little cost (because the operations were undertaken on the journeys between the polar regions) about as much frozen whale meat as it imported from each of its "joint ventures" in Chile, Peru, Brazil, Spain, South Korea, South Africa, and Canada. That adventure ended because the countries near which they operated did not agree to set up joint-venture land stations; and the IWC scientists showed that the Japanese "estimates" of the numbers of Bryde's whales were unacceptable scientifically. Then, in 1979, the Indian Ocean was declared as a whale sanctuary, with the support of all the Indian Ocean coastal states, both those that were members of the IWC and those that were not at the time (some of which joined later).

Countries awarding special permits to their nationals do not have to do more than tell the IWC that they are "for scientific purposes." Attempts by the IWC to exert some control or even supervision of the permits have never succeeded because such activities are specifically outside IWC jurisdiction and cannot be brought within it except by rewriting the *ICRW*: there have been three serious attempts to do that, and all have failed. For this reason, Japan has been free to continue what is, in reality, unregulated commercial whaling in the Antarctic and North Pacific for more than 20 years. When this began, in 1987-1988, an Institute for Cetacean Research (ICR) was established in Tokyo from remnants of the legitimate whaling industry and staffed by the very scientists who had insisted during the 1960s and 1970s that the Antarctic whales were not declining, might even be increasing, and had promulgated such absurdities as that minke whales should be "culled" because they were increasing and preventing the almost extinct blue whales from recovering. (It turned out they were not recovering because the USSR had been killing them illegally.)

In an effort—that was only partially successful—to restrain scientific whaling and provide the long-term protection needed for the Antarctic ecosystem, the IWC adopted in 1994 a proposal that originated with France to declare the entire Southern Ocean as a whale sanctuary. Japan did



On the Grytviken whaling station on South Georgia at the beginning of Antarctic whaling, with a blue whale on the deck (Google Images)

not object to that except to the inclusion of the minke whale among the species protected by the sanctuary, but this action did not, unfortunately, impede its scientific whaling in the area nor its expansion in subsequent years. Every year thereafter, the Japanese delegation sought, entirely unsuccessfully, to have the sanctuary abolished on the grounds that it had not been recommended by the Scientific Committee and that it is illegal, notwithstanding the fact that the creation of sanctuaries is explicitly provided for in Article V of the *ICRW* and that sanctuaries had been established twice before, elsewhere, to which Japan had not lodged objections. In fact, the idea as a basic management and conservation measure goes back to proposals made in the League of Nations in 1930.

The ICR in Tokyo plans and conducts the "research," runs the fleet, and oversees the marketing of products—meat and oil from the "sampled" whales. Article VIII provides a fine example of the "unexpected consequences" of decisions. The pelagic whalers in the Antarctic had long been preoccupied with the problem of waste, at least since they ceased using dead blue whales as marker buoys and ships' fenders. So Article VIII says that the "samples" must be "processed" and the "products" from them properly dealt with. This "positive feedback loop" of course, makes it inevitable that the "proceeds" will be used to pay for the "research" and justify its indefinite continuation. In fact, Japan's scientific whaling is not in itself profitable and so has to be subsidized by the government to a variable degree—sometimes up to 50% of the operating costs.

In the first decade (1987 to 1997), the scientific whaling lobby offered what looked a bit like serious scientific justification of their plans. It was at first claimed that systematic sampling would provide estimates of the age-dependent natural mortality rates that would make scientific management more efficient. It did not, and it was soon shown that it **could not**. The rationalization then shifted to claims of providing data for multispecies management. That did not happen. The latest claim was that whales were eating a lot of commercial fishes (the baleen whales, at least, do not, though some of them eat some fish, sometimes, in some places) and that this was a serious problem for global fisheries and world food security; the Government of Japan even went to the FAO with this ridiculous assertion! That rubbish provided an excuse for "sampling" bigger whale species than the minke, and the "fish competition" hypothesis plausibility to those ignorant of such matters helped persuade several IWC delegations to vote with Japan for the lifting of the 1982 moratorium through what Japanese authorities called a *vote consolidation operation*. In recent years, practically all pretence has been dropped that the scientific whaling program is a serious research operation, even to the extent that a few days before the beginning of the 2010-2011 whaling season, the "research area" was arbitrarily and abruptly enlarged. An even more obvious example that the research plans are fake has recently been provided by the fact that when the recent tsunami caused havoc in Northeastern Japan, the Government of Japan simply instructed the owners of those boats that were not sunk or damaged to "take samples" off Hokkaido.

The changes in the scientific program from 1987 to the present have to be evaluated in the context of the long-term strategy of Japan's whaling lobby. Japan began Antarctic whaling in the 1930s for one purpose only—to sell whale oil to Germany that was short of dietary fats and subject to League of Nations sanctions implemented by France and the UK. (Remember the slogan of Josef Goebbels and Hermann Goering: "Guns not butter!") That was not mere altruism toward its Axis partner: Japan needed money to buy fuel oil from the U.S. for its military machine, and the factory ships served to transport both whale oil and petroleum products around the world. At the time, Norwegian diplomats noted that maybe Japan and Germany would displace Norway from its role as premier among whalers. (In fact, large-scale commercial whaling has long had close association with war and the military. One of the main uses of baleen whale oil up to World War I by the British was as a source of glycerin for the manufacture of explosives.) Japan's entire whaling fleet was lost during WWII, and the survivors of Germany's fleet were distributed among the victors as war booty. The UK played lead in the occupation of much of Germany, especially the Baltic ports, and

put a stop to its attempt to get back into Antarctic whaling. But Japan, no more short of fats for human consumption than was Western Europe, was encouraged to resume whaling by the U.S. occupiers of the defeated country. A combination of technical efficiency, enterprise, government support, and a huge domestic market for a product much more valuable than oil—frozen meat—led to Japan's eventual dominance of the industry, which became a monopoly when the USSR dropped out from it after 1987.

Pelagic whaling in polar conditions is more "hi-tech" than most people would imagine. It took the Norwegian and British companies many years to perfect factory ships and their special machinery that could efficiently conduct the operations of processing and fully utilizing whale carcasses, especially on the high seas and in polar conditions. The essential special skills of the officers and crews have also long been acknowledged, especially those of the gunners on catcher boats. Once that knowledge and skill is put aside, it would be extremely difficult to resurrect them. When, with its new monopoly, Japan engaged in large-scale scientific whaling, it was thought at first that its expectation had been that the moratorium would soon be lifted and unimpeded hunting—mining—of minke whales resumed. After a few years, it became clear that was not going to happen. The scientists were not able to detect recovery of the protected larger whales in a short time, and it was taking much longer than had been thought to develop a safe management scheme to replace the failed NMP. Those were the two conditions to be met before any non-zero catch limits would be set. I believe that as that fact became clear, Japan's basic policy changed and its tactics shifted accordingly. Any serious profit from Antarctic whaling could come only from recovered stocks of the larger whale species, especially the fin whale, each one of which yields 10 to 15 times as much meat as is obtainable from a minke whale. That implied a very long wait but, given the observations of the recovery of humpback whale populations, perhaps not *too* long, especially when considering Japan's well-known, generally long-term view in investment practices.

Throughout the second decade of scientific whaling, the Government of Japan repeatedly demanded that the moratorium be lifted, and also that some arbitrary number of whales be awarded to its coastal whalers operating in the Northwest Pacific. (They were absurdly portrayed as akin to the "aboriginal subsistence whalers" of Alaska and Greenland. They can equally be seen as a future fount of skilled gunners and crews able to operate in dangerous waters.) These pleas/requests/demands were repeatedly denied by the IWC majority, which led to charges that the IWC was being made "dysfunctional" by the harshness, obstinacy, and ideology of the non-whalers! More than one Japanese scholar of history and socio-politico affairs has claimed that the whaling lobby has not for many years really wanted the moratorium to be lifted. After all, pelagic whaling receives a huge "scientific subsidy" that would surely not be available for straight commercial whaling. And the whalers can now go where they like, when they like, and kill any and as many whales as they wish.

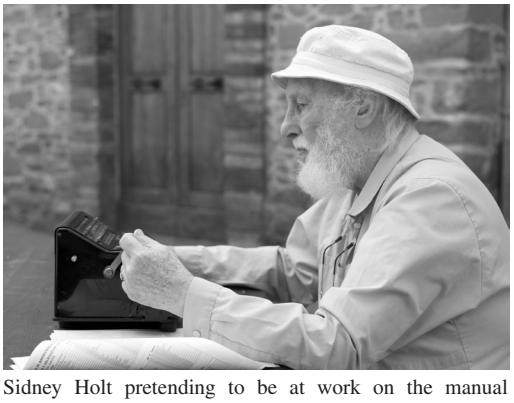
That evaluation of whaling politics makes sense to me. Consider the historical reality. No whaling in the modern era has ever been conducted at sustainable levels. It is a **mining** industry, not a "harvesting" one. From 1971, Japan and the USSR began a new project of mining the Antarctic minke, and Japan decided to continue that after the USSR opted out. Before the 1960s, the British and Norwegians had mined fin and blue whales; and in the 1960s and 1970s, Japan took the lead in mining sei and pygmy blue whales while the scientists (I was one of them!) were trying to determine safe catch levels for the disappearing blues and fins. When the future of Antarctic baleen whales was under discussion in the 1970s in the context of negotiating the NMP, the Japanese scientists' approach to sustainability and the maximum sustainable yield (MSY) target was that it justified the reduction of hitherto less exploited species and stocks as fast as possible to bring them down to the MSY stock level. In fact, there is some perverse sense in the mining approach when considering animals that reproduce slowly probably provide rather low sustainable yields from large population biomasses, and regarding the biological productivity of which there is great uncertainty so that precautionary catch limits are *de rigour*. It is fashionable now to believe that fish and other wild animals must, if exploited at all, be exploited sustainably, with sustainability defined in biological parameters. But "safe" sustainable catches can be quite uneconomic, considering the cost of obtaining them—and consider the enormous cost of sending ships from the Northern Hemisphere to the Antarctic and back. In such circumstances, mining might be the only route to profit.

The possible long-term whaling strategy of the Japanese interests may be meeting other hurdles. The market for frozen whale meat seems to be shrinking; younger people aren't very enthusiastic about it (older people, now dying out, grew up with it in the hungry post-war years), and there is a substantial unsold stockpile. Money now has to be spent just to persuade people to consume it, and even more taxpayers' money is devoted every year to persuade other governments of small

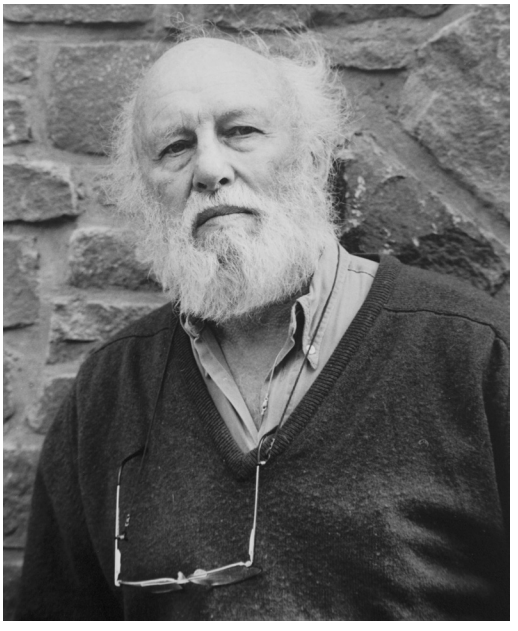
developing countries to vote with Japan in the IWC. The *Nisshin Maru*, now Japan's only factory ship, is relatively small (8,000 tons; only one third the size of the monsters of the 1970s), has poor processing capacity except for freezing meat, and is getting old. To meet new conditions set by the International Maritime Organization (IMO) for operating in Antarctic waters, she would have to be upgraded soon. Commissioning of a new, bigger vessel has been discussed in the last few years, but the cost would be enormous. It was precisely the high cost of factories and modern catchers that necessitated large bank loans in the 1950s and 1960s and made it impossible to reduce catch limits to sustainable levels quickly enough or at all. If I were a betting man—which I am not, so no offers from readers please—I would wager that Japan will soon cease scientific whaling, at least in the Antarctic and probably in the North Pacific, too, for reasons of operational cost. I say that out of my respect for Japanese business acumen and intellectual skills. Perhaps a little face-saving may be in order, and perhaps the Sea Shepherd Conservation Society (SSCS) has provided for it during the 2010-2011 season. After being harassed by SSCS ships for several weeks, the *Nisshin Maru* did an about-turn in the Drake Passage and headed home in midseason, having taken only a small fraction of its intended "scientific samples." The claim was that SSCS behavior had made continued whaling too dangerous. It's hard to see how being closely followed for days by an 800-ton vessel can really be dangerous to a ship ten times its size and armed with water cannons as used to quell riots on *terra firma*, but I'm not a mariner and may be missing something.

Let me end by returning to science. For several of the post-moratorium, scientific whaling years, a group of members of the IWC's Scientific Committee were intensively engaged in an exercise that is changing the face of scientific management of fisheries. They were developing a Revised Management Procedure (RMP) intended to replace the NMP. It would be more precautionary, seek different goals (newly specified by the Commission itself), and not be dependent on assumptions about the type and parameter values of population models and the constancy of the ocean environment. The method of work was itself novel—five groups of scientists competing with prespecified performance criteria and testing procedures and performing an enormous number and variety of computer simulations. The competition was won by a British scientist, Dr. Justin Cooke, resident in Germany; his Catch Limit Algorithm (CLA) was acclaimed by the IWC Scientific Committee and adopted in principle by the Commission. Three other independent scientists—William de la Mare, Douglas Butterworth, and Andre Punt—came very close. The RMP has not yet been implemented because the Commission decided—I think rightly—that there must first be agreement on instruments to ensure compliance with regulations in a Revised Management Scheme (RMS). After many years of tedious but fruitless negotiations to that end, the Commission has, for the time being at least, put that process on hold. Meanwhile more and more people, and their governments, are coming around to the idea that commercial whaling should cease, permanently, anyway. In these circumstances, my guess is that the RMS will never be finished, much less implemented. While it is a pity that so many scientific person-years have been practically wasted in the RMP development, the good side is that it has paved the way to better management of fin-fishes and shell-fish fisheries that are sorely needed. Many groups of scientists are now following that path. Whether they will persuade management authorities to follow them remains to be seen.

In the first decade of the Third Millennium, during which the IWC adopted an initiative by Mexico (but boycotted by Japan) to establish a Conservation Committee, much more attention has been given to scientific issues other than counting whales and calculating how many of them can "safely" be killed. Their value alive rather than dead has come to be appreciated, and whale watching has become a substantial global industry, though not yet, I suspect, as profitable as whale mining. Together with that, scientific interest has exploded in the study of behavior in the wild, the effects on cetaceans of environmental changes, and other threats to the well-being of the whales such as the dangers of collisions with ships. The new *Law of the Sea* requires that in managing commercial fisheries, attention must be given to leaving enough sustenance for "dependent



Sidney Holt pretending to be at work on the manual calculator he and Ray Beverton used 50 years ago (Photo courtesy of Tim Holt)



Sidney Holt (Photo courtesy of Janet Carmichael)

species"—the opposite of culling them to benefit the fisheries. One problem with the *ICRW* has long been that it does not define *whales*. Many governments think that means all cetaceans; others think it means only the largest whales. The resulting decades-long stalemate has meant that big, directed hunts for smaller species—such as pilot whales in Faeroes and off Japan, Pacific bottlenose whales and Dall's porpoise, and others—have been unregulated except in some cases under rather lax domestic laws. However, despite some resistance, the IWC's Scientific Committee has regularly looked at such scientific information as may be available and offered recommendations for conservation-related actions by governments.

It has long been thought that the whales and dolphins are sentient, especially intelligent species, and some of the most exciting research, I think, has recently been about the existence of "**culture**" as seen in the social behavior of some of them; particular attention has been given to the sperm whale by several researchers and especially by Professor Hal Whitehead at Dalhousie University in Halifax, Canada. Personally, I am excited, too, by the fact that the bottlenose dolphin has been shown by clever experiments to be **self-aware**—one of five species so far identified, including us. I would bet that sperm whales are self-aware—why otherwise would they each give themselves a unique "name" as they do?—but, it will be difficult to prove it, as with dolphins, elephants, bonobos and grey parrots, with mirrors.

Postscript

The 63rd Annual meeting of the IWC, held on the Island of Jersey, mid-July 2011, ended on its fourth and last day in chaos. Brazil and Argentina had again presented—in their 10th year of attempt—a proposal to declare the South Atlantic as a whale sanctuary, contiguous with the existing Southern and Indian Ocean sanctuaries. They were supported by all Latin American Members, the U.S., all EU Members, Monaco and Switzerland, Australia and New Zealand, and possibly some others. They asked for consensus but, if that was not forthcoming, they would call for a vote, something the IWC has not experienced for several years. The proposal was bitterly opposed by Japan, Iceland, and some Caribbean states politically close to Japan. Norway and Russia were also hesitant.

When a vote was called, the Japanese delegation walked out, leading its supporters, with the object of making the conference void by denying a quorum. Instead of taking a roll-call, the Interim Chairman—the Commissioner for South Africa, who had conducted the meeting until then in an exemplary manner—adjourned, and Commissioners went into a meeting in camera for several hours. On their return, the meeting was quickly closed and remaining agenda items referred to the beginning of the next annual meeting, scheduled for Panama in June 2012. This year's meeting did not consider environmental issues, whale watching, or any of the items discussed in the Report of the Conservation Committee.

On previous occasions, the proponents of this sanctuary received simple majority support but not the three-fourths needed to make a binding decision. This year, if a vote had been called, a three-fourths majority might have been possible, particularly as many of the opponents had not paid their dues and thus forfeited their voting rights. Even if a binding decision was not made, it is certain that the simple majority would have been bigger than all the previous ones. I suspect that Japan realised this and so decided to blow over the house of cards that is the IWC these days. The IWC's quorum provisions in the 1946 Convention and in the current Rules of Procedure are ambiguous, so it will try to reach agreement on interpretation and clarification before the Panama meeting.

The one good action in Jersey was a consensus—reached with great difficulty and vigorous opposition by some—for the UK/EU states' proposal to require that payments of fees be by digital bank transfer between state bank accounts and the IWC account, not by cash or check payments drawn on questionable accounts to the secretariat, as some Members practiced rather too often. The price of

consensus, however, was dropping the other half of the UK/EU "transparency" proposal to grant far more access to deliberations by the representatives of "civil society"—NGOs and the like. But that item comes back with priority in Panama. It is notable that the transparency proposal was opposed by practically the same countries as those who did not like the effort to impede possibly corrupt payments or the proposed sanctuary.

Although the report of the IWC's Scientific Committee (which met earlier in Tromsø, Norway) was voluminous, its contents were not very exciting. Still, a good start was announced by Australia in a cooperative study of the numbers and locations of the still-rare blue whale in a sector of the Antarctic. Unresolved arguments continue about the limits of the range of a critical variable called the net recruitment rate in the Catch Limit Algorithm of the IWC's Revised Management Procedure. Iceland's self-awarded quota for fin whale catches was shown to be much higher than would be given by the RMP, even by a relaxed version devised by Norwegian scientists, and not yet tested by the Scientific Committee by comprehensive simulations, but which gives much higher immediate catches while making inadvertent stock depletion less unlikely. Iceland and Norway would prefer that some day the whaling in the North Atlantic be "managed" more to the liking of the whalers by the North Atlantic Marine Mammal Commission (NAMMCO). The Scientific Committee is still unable to agree on the number of minke whales feeding in the Antarctic despite several decades of sighting surveys. Two methods of analysis of the raw data give widely differing answers, though they agree in revealing that the estimated numbers from the last of three six-year circumpolar surveys are significantly lower than those from the second survey. The reasons for this are unclear.

The proposal by Monaco to the UN that "full and permanent protection" be granted for all Highly Migratory cetaceans (that's nearly all of them except the harbour porpoise and its close relatives) on the high seas was not discussed on the IWC floor but certainly was in the corridors. That proposal comes up at the UN General Assembly in November this year, for debate and possible decision in principle.

Acknowledgments

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