5

The End of the Cetaceans' Reign

One of the first global maritime industries was undoubtedly whaling. It is not known for sure when systematic whaling began, but there is written evidence that in the ninth century AD there were already what we might call small businesses that chased whales from onshore. In Korea there are caves describing the capture of whales around 6000 BC, and the Romans rounded up and killed whale specimens for trade. However, as the chronicles show, it was more sporadic than a flourishing business. Hunting them down was certainly a lucrative, but also a dangerous and strenuous enterprise. In the early Middle Ages whaling boats followed the large cetaceans long distances by rowing, first harpooning them then waiting for the huge animal to come up to the surface to harpoon securely its prominent back. It was normal to wait until it was exhausted before attempting to turn it over and open so it would bleed to death and could be dragged to a larger boat or to the shore to be cut up. It was not an easy task, because whales have immense force. They are combative, and the waters where the first hunters ventured were usually icy. The documents speak of intense hunting in the North Sea and the English Channel around the eleventh and twelfth centuries AD, where sailors, especially Basques, spent long periods of time chasing cetaceans. By the fourteenth century, there were already signs of a steep decline in the populations of several species in this part of Europe, particularly along the coasts of Normandy, Flanders and England. Some of them, such as the Atlantic grey whale, ceased to exist around the eighteenth century.

As in other fisheries around the world, the Basques were pioneers and were systematic. In the sixteenth century more than thirty galleons, with some two thousand crew specialized in capturing cetaceans, were based in Labrador and

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set out north to hunt in remote Greenland. The chronicles speak of places where thousands of harbour porpoises, belugas and other small odontocetes (with teeth) were concentrated. Those same chronicles speak of areas where the great baleen cetaceans (without teeth) were grouped in hundreds of specimens, so hunting, despite all the difficulties, was quite simple due to the great numbers. In the northern hemisphere the English and Dutch displaced the Basques, as the latter could not easily access the areas to hunt whales or fish for cod without entering their territory. Around the island of Svalbard in northern Norway, the Dutch had over 240 whaling ships in 1684. The stocks at that time were already beginning to show signs of decline.

That was a reason for searching for unexplored seas, areas where the systematic hunting of large cetaceans had not yet arrived. The history of whaling is one of shipbuilding companies always in search of new fishing grounds, such as those in Patagonia, which began to be exploited methodically in the early 1700s. Whalers (and other fishermen) were pioneers, often arriving in places where even explorers had not arrived, such as the inhospitable waters of the Antarctic Peninsula. They kept secret their discoveries (as we have seen with cod) to be able to exploit the fishing grounds for longer, since many of the products derived from whales had become essential to an increasingly populated and sophisticated world. The oil from blubber had become essential for lamps and lighting systems, and the bones for various types of structures, even corsets.

Everything was taking advantage of the cetaceans, who found a new enemy in 1840 in the form of explosives. The first harpoons with a small charge on their tips were more efficient and lethal, which considerably reduced hunting time. At that time whalers began to hunt cetaceans systematically in the Pacific, first on the coast of California and in the Gulf of California, where they were grouped in large numbers after long migrations. In 1872 the migration was practically nonexistent, as the whalers of the area had exhausted the stocks. But new fishing grounds had to be found, as it was essential to reach other places where the 650 American vessels, with their more than 13,500 sailors, could fish. The business had to continue, so the Aleutians and the North Pacific, one of the last whaling destinations, were plundered. By the end of the nineteenth century, more than half of the places where whales were known to swim were empty: the populations were either extinct or so small that they were not worth the effort.

Then whaling began to go for anything, any cetacean. Whale oil was not much appreciated, because it was more expensive than mineral oil, but products such as whale meat, fat or bones continued to be in great demand. Upon the introduction of the diesel engine and other technologies, whales of

every kind had their last moments, even in remote Antarctica. The Japanese came into play. They have always had a whaling tradition, but their catches had been mainly focused on the Japanese Sea between Korea and the Japanese archipelago. Whaling intensified, especially after the Second World War, whales being a cheap source of protein and fat for Japan (and other countries). But a decline came a few decades later. Japan went from a peak catch of 226,000 tonnes in 1962 to 15,000 tonnes in 1985 (just before it was banned worldwide). The decline in stocks indicated the imperative to stop whaling. The Japanese research institutes, closely linked to the country's whaling industry, were gagged, unable to provide clear statistics or even guesswork about the collapse of cetacean populations of all kinds: 'While in 1960, up to 23,000 dolphins were hunted in only two specific areas of the Sea of Japan,' says expert Toshio Kasuya of Japan's Nagayama Institute, 'in the same area they did not reach 1,000 in 1983.' Other cetaceans, such as sperm whales, went from an annual catch of about two thousand in the 1960s to ceasing to exist between Japan and Korea as a commercial species by 1970.

Then, in just two decades, instead of the moderate and more or less stable increases that had taken place between 1910 and 1950, the size of the catches soared. In 1976, after the ensuing drastic decline in their numbers, most whale species in the North Pacific were protected. But it was not until the early 1980s that a moratorium prohibited the hunting and trade of most cetacean species. Even now, in the Pacific, populations of some species such as the minke whale (*Balaenoptera acutorostrata*) continue to be under pressure from the whaling industry under a scientific banner. 'We have seen that both whales caught and by-catch by pelagic nets and those hunted for scientific purposes come from areas that are theoretically entirely reserved for population recovery', says Vimoskaselhi Lukoschek of the School of Biological Sciences at the University of Auckland, New Zealand. 'The Japanese stock is considered to be on the verge of collapse, with little chance of recovery'; the 'genetic fingerprint' indicates that these whales are present in Japanese dishes throughout the territory.

Japanese, Russians, Norwegians and Icelanders, each in their own way, have insisted on the need to revise the whaling ban treaties, arguing that there are now instruments to make whaling more sustainable. But, despite the fact that some populations are showing clear signs of recovery, protection measures are still in place for these animals whose populations are far below those in the historical records of the past.

From historic information (navigation logs of sailors from previous centuries and the docking of ships), it has been concluded that in the sixteenth century there may have been up to 36 million specimens of fin whale

scattered around the planet, and up to 24 million humpback whales. However, these data have been proven to be unreliable. Using a much more sophisticated method, that of population genetics, a figure ten times higher has been calculated; that is to say, there were about 500 million whales, taking into account just these two species. The numbers, very approximate and probably a little inflated, once again allow us to glimpse a completely different reality from the current.

The question, once again, is, so what? What difference does it make? Whales are majestic, beautiful animals, a symbol for many people of the essence of the ocean, but does their disappearance mean anything? As in the previous examples of seals, sea cows, great auks, seals and turtles, what if they disappear?

I will try to illustrate with a concrete example what the loss of these organisms means. In just 370 km of coastline in the Aleutian Islands, 62,858 whales were hunted in a declared manner between 1949 and 1969, representing some 1.8 million tonnes of meat, bones and fat. At that time there was also a decline in phocids, sea lions and sea otters, although they were protected. No one fully understood what was happening and, although it was also known that fish in many areas were much less abundant, it did not appear to be sufficient cause for the pinniped and musselid populations' failure to recover. In some areas they disappeared completely. Alan Springer and his collaborators from the Institute of Marine Sciences at the University of Alaska saw it clearly: 'Whales, especially whale calves, are a very important part of the killer whale diet. Some species seek out protected areas in warmer waters even in the tropics where food is much scarcer but where they can give birth to their young and protect them from the killer whales.' 'Killer whales', or orcas, indeed used to be known by whalers as 'whale killers' but, if there are no whales, these creatures look for other prey. The almost 4,000 people who inhabit these sparsely populated 370 km of coastline began to change their diet. They replaced whale meat with that of seals, sea lions and otters, a much less calorific meal and much less appetizing, yet more affordable and always more profitable than fish. 'The problem is that killer whales have less and less food and attack any prey', adds Springer. The biomass of whales is 60 times greater than that of pinnipeds. We can look at the numbers any way we like, but the reality is that by removing so many whales we have removed another key piece of the system. Whales ingest enormous amounts of food, defecate immense amounts of faeces, supply much food to other organisms and, being so long-lived, retain much carbon in their structures. Our seas, increasingly dominated by short-lived, accelerated-cycle beings, are transformed, unable to retain carbon in the same way as long-lived, complex, accumulating animals

or plants in the form of their tissues. We are faced with a system that cannot recycle matter in the same way as before. It is changing, and we do not know for certain where it is going and what role this type of organism plays in regulating ecosystems and the climate in general.

Disclosing Irregularities

I am sometimes surprised by people's capacity for deception and lack of remorse in continuing to exercise their 'right' as a predator, even when it has been shown that one or more species are heading for collapse due to their unscrupulousness and limited vision when exploiting a reserve. When I read that Scott Baker of the University of Victoria (Australia) had carried out an exhaustive study on the recovery of humpback whales back in 1991, I was disconcerted by what he had found. I realized that data concealment was going to be the key to why these large cetaceans were no longer crossing the New Zealand Strait, stretching from the Antarctic continent to Oceania. Could an environmental phenomenon be involved? Had there been a change in the diet of the whales that had led them astray? The local inhabitants insisted that hundreds of whales used to pass through every year and that, despite protection, the populations did not seem to be recovering.

Almost twenty years later, Phillip Clapham of the Seattle Marine Mammal Institute revealed the secret. 'The Russians (and other countries) were illegally and unregistered hunting thousands of whales in that area of the world', he reports. From 1947 to 1991 the then Soviets had certain hunting quotas. In fact, on board each ship there had to be an official marine biologist, a professional who would report all the catch data of the whalers operating in the area. The data were transferred to the International Whaling Commission (IWC), which was responsible for sorting and using the data to track stocks and assess whale stocks around the planet. However, there was double counting. In one book, they wrote down the real catches: all kinds of whales, without looking at size or species, but scrupulously recording the real biological data. These data were passed on to a department of the Ministry of Fisheries and to the KGB itself. In the other book, the 'official' version, fictitious catches were noted, those that fell within the provisions of the quotas and the regulations. The biologists signed the KGB's own documentation, in which they undertook not to say anything about this double counting. The information, passed on from various Russian institutions during 2008, has cost the job of more than one biologist and official. Some of them photographed parts of the original files (in total, more than 60 thousand

pages) with their mobile phones and passed them to their foreign colleagues from their office computers. From 1959 to 1971, for example, the Russians hunted more than 48,500 whales in Antarctic waters, while the official IWC disclosure was no more than 3,000.

Humpback whale populations were already in decline, but the Soviet fleet had delivered the final blow in this part of the world, where control is difficult. 'There are now between 3,000 and 5,000 humpback whales in that area, 20–25% of the original population, being optimistic,' says Scott Baker: 'With all the restrictions that exist today (and taking into account a certain percentage of poaching), these populations may not recover in this area of the planet until well into 2050.' Hiding the information has consequences for IWC ecologists and fishing technicians working with models of recovery of large cetaceans: 'The numbers we have done so far did not take into account this type of mass poaching', says Vernon Smith of the US National Oceanic and Atmospheric Administration (NOAA). It is clear to the scientists involved that self-regulation is no use: there must be an effective supranational body to monitor the various countries involved in the capture of cetaceans.

Scientific Hunting

An article in a prestigious polar scientific journal suggests that in sub-Antarctic waters minke whales (one of the smallest baleen cetaceans) have lost 9% of their body fat over the last eighteen years due to the increasing shortage of krill. 'The increase in the number of predators of this crustacean and the decrease in its biomass are possible causes of the decrease in stocks', writes Kenji Konishi of the Tokyo Cetacean Research Institute, in collaboration with the Institute of Medical Science of the University of Oslo in his *Polar Biology* article: 'They could have lost as much as 0.02 cm per year.' The data are interesting, but the controversy lies in what scientists call sample size and the type of sample used to arrive at these conclusions: 'To avoid statistical errors, 2,890 mature male whales and 1,814 pregnant females have been hunted', Konishi and his colleagues report in the article. More than 4,500 minke whales have been hunted between 1988 and 2005, increasing the numbers from about 250 to more than 400 per year.

Some scientists are deeply concerned about this article. *Polar Biology* is the most prestigious polar journal of marine biology in the world. By accepting this article, two serious mistakes are being made: the first is to tender for whaling, which is illegal, through work that is published in a rigorous scientific journal; the second is to suggest that in science 'anything goes' to

achieve a specific objective—that the means justifies the ends. It is as if it is now being said that, in order to study what seals or penguins eat, we need to sacrifice five or six thousand specimens in search of a scientific article. What is the ethics? Any scientific work must first go through referees, two or more anonymous scientists who give their opinion, then correct and even reject an article according to the rigour of the data and the approach. Having published the work in an internationally recognized scientific journal, the Japanese and Norwegians have a tool to defend their covert hunting policy.

The minke whale (*Balenoptera acutorostrata*) is one of the most hunted cetaceans on the planet. According to the Species Regulatory Body (CITES), this whale, not being a threatened species, is at the limit of its exploitation, and the evolution of its populations must be closely monitored. In 2007, the Japanese government intended to catch 935 specimens, but the actions of conservation groups caused this number to fall to 551: 'We had to stop catching 45% of what we had planned', said a representative of the Japanese Fisheries Agency: 'We don't have enough time for the investigation because of the assaults and impediments caused by the conservationists.' The whales processed by the scientists are transferred to a company that finances the Institute itself and sells the meat. 'Over the past few years there has been a remarkable increase in catches', says Junichi Sato of Greenpeace.

Conservationists are most concerned about this upward trend, especially in Antarctic waters. I would query whether the Antarctic Treaty does not specify that fishing in its waters is prohibited for these and other species? As we can see, we respect nothing. The problem, in my view, is that targets can easily be shifted to other species. 'This year, 50 humpback whales are planned to be hunted in the waters of the white continent,' says Geoffrey Palmer of the New Zealand Whaling Committee, 'and some countries have already established areas where we have banned the hunting of all whales.' Australia, for example, has declared a 200-mile zone around its coastline to be free from hunting for these animals, considering it an inviolable sanctuary. The controversy continues, but several countries have criticized the fact that, with a huge fishing sector and a large number of cetaceans being hunted, there has been a meagre and questionable number of scientific works (less than 60 in more than twenty years).

I go beyond that. I think it is incredible that a scientist should have this work in his hands and not clearly denounce this farce, whereby nothing significant has been promoted to increase our understanding of the dynamics of the species, at the cost of the whales that have ended up being eaten in oriental restaurants.

Whales and Climate Change

Like all organisms on this planet, climate change affects the immediate future of cetaceans. These large, warm-blooded vertebrates, already under pressure from other factors such as hunting, pollution (especially plastics), lack of food resources or disease, have to withstand oceanic transformations on a small, medium and large scale. Many species of whales migrate extensively, so changes in temperature and productivity of the waters will affect them but, according to specialists, they may be the ones that are most likely to adapt to new routes. 'Migratory species are an enigma, because it is not known if their ability to move will allow them to quickly change the latitude at which they seek food or a place where they can give birth in peace', says Mark Simmonds of the Whale and Dolphin Conservation Society of WWF-International. In fact, there are cetaceans like the Gulf of California porpoise, the vaquita, that literally live trapped in an environment from which they cannot escape. If water temperature changes rise and significant oceanographic changes occur as predicted by the various specialists, the species will have no escape and will either adapt to the new food and thermal regime or become extinct. The same will happen to freshwater dolphins, such as those of the Ganges or the Amazon, which are restricted, by their evolution, to specific places from which they cannot escape.

There is no doubt that the most important effect will come from changes in the food chain. 'In both the North Sea and the North Pacific, the trophic structure of the system is already changing,' adds Simmonds, 'and it is only a matter of time before other seas are affected by a similar trend.' But these changes, replacing species phytoplankton and zooplankton of colder habits with species accustomed to higher temperatures, are not bringing more energy to the system. In other words, they are not a substitute in terms of either abundance or calories, and they are not a more succulent snack. On the contrary, it is being proved that, in general, they are poorer in energy.

The habits and diet of those who depend on the dynamics of ice for their livelihoods will also be severely disrupted. In this case, because the formation and melting of ice year after year forces the system into specific patterns of light and nutrients, all organisms (including cetaceans) that depend on its dynamics will be severely affected. Ice reduction may be critical to many specialist organisms, which will be restricted in their distribution and replaced by competing species. The most obvious cases are those of the narwhal (*Monodon monoceros*), beluga whales (*Delphinapterus leucas*) and the Greenland whale (*Balaena mysticetus*), the first being the most vulnerable due to its intimate relationship with the icy layers of the oceans.

We must not forget the other hemisphere, perhaps even more vulnerable because of its intense over-exploitation in past decades. Here, no less than half of the biomass of marine mammals from all over the world is concentrated, all dependent in one way or another on one type of small crustacean: krill. In the Antarctic seas, changes in the dynamics of ice and its regression in certain areas are affecting this small crustacean on which fish, penguins, seals and, of course, many species of cetaceans (especially baleen whales) depend. The recovery of large cetacean populations from intense hunting may be affected by a lack of adequate food. Applying the precautionary principle to the management of these cetaceans is therefore essential, since the changes already suffered by their populations are compounded by one that is even more global and difficult to predict: climate change.