JENS MUNK'S DEPICTION OF WHALE FISHING IN THE 17TH CENTURY

Cod fishing and whaling among sea monsters in Norway

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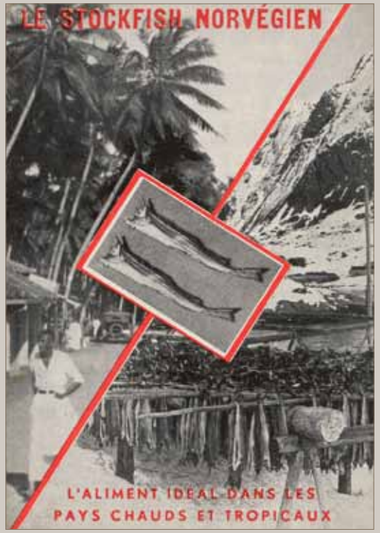


FOREIGN ADVERTISEMENTS FOR NORWEGIAN STOCKFISH

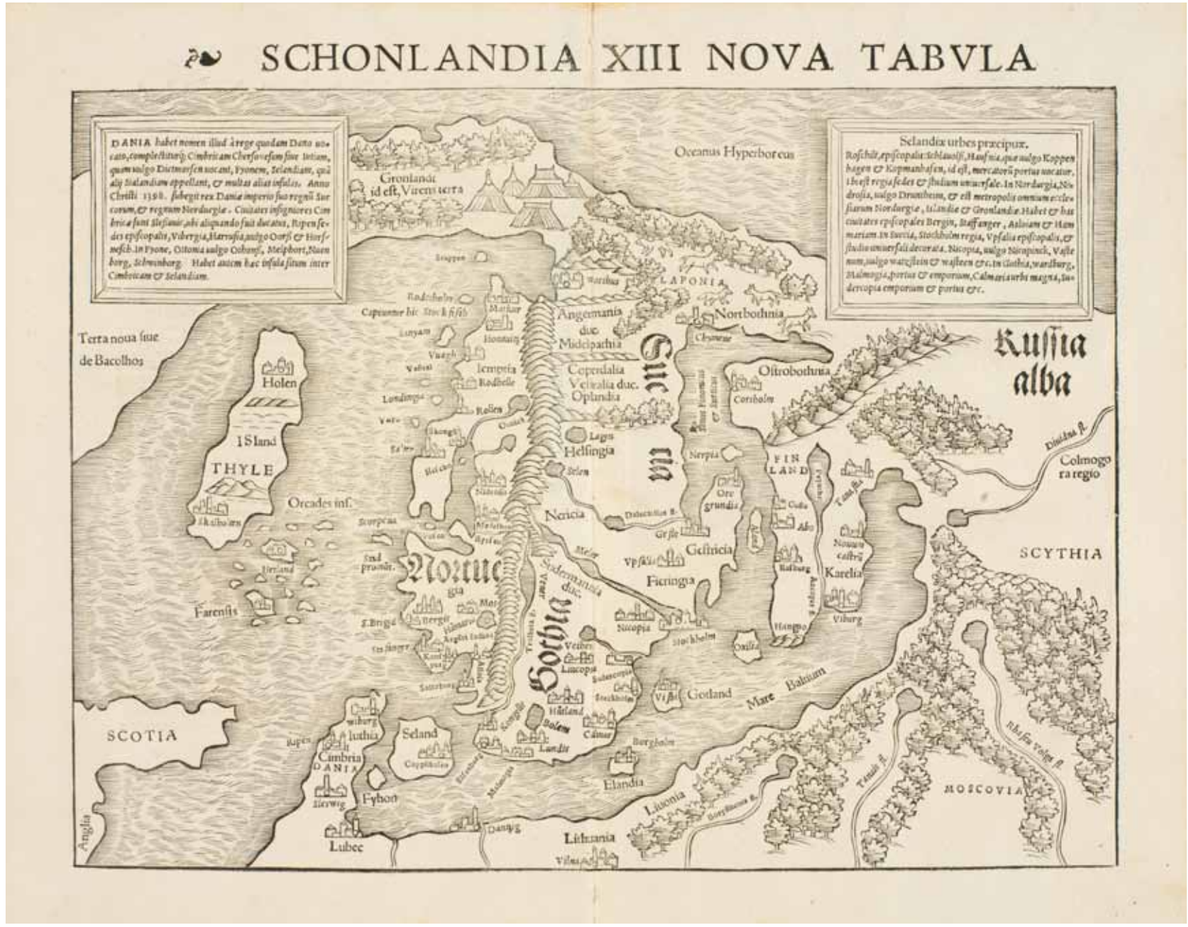
For centuries, fishing and whaling have been of economic importance to Norway. Fishermen often spent long periods of time out at sea and were accustomed to rugged weather and working conditions. Olaus Magnus[1] wrote that there are several reasons why fishing in the Norwegian Sea was held to be dangerous. Because fishing often occurred at great distances from the coast, fishermen could be trapped in terrible storms and engulfed by the waves, or scattered by giant blocks of floating ice. Fishermen could also end up being separated from their companions and forced to sail in different directions, all the while fighting off whales and other sea monsters. Sea monsters appeared frequently in maps and stories a few centuries ago. This is not very surprising. Giant squids, sharks and whales are a few examples of marine animals with an impressive appearance. Such animals may have been the basic ingredients of many of the stories fishermen and explorers told when they returned home from sea – and by spicing up their stories with a bit of imagination, mythological species were born, described and put on maps!

KINGS AND CODS

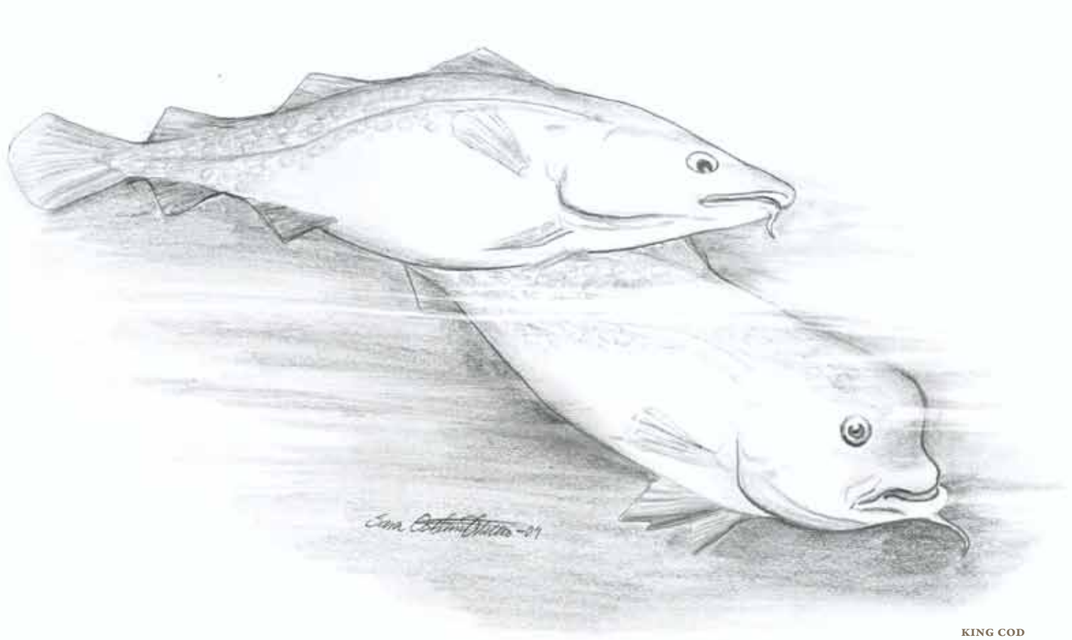
Since the Viking Age, dried cod and later also dried and salted fish have been exported worldwide. Petter Dass (1647–1707) was a clergyman and a famous poet in Norway. In one of his poems from his famous work *The Trumpet of Nordland*,[2] he describes the impact cod fishing had for the people in Norway:

Well, now I must come to the king of the fish,
The aim and the object of northerners' wish,
The cod, called the «skrei» in Norwegian.
It hangs on the rocks, and it fills all the stores;
Praise God that this fish comes each year to our shores;
It feeds both the wives and the husbands.
O cod, you are truly our livelihood nigh;
You bring us from Bergen the much needed rye
And feed Nordland's fishermen amply.
O Lord, in your mercy lift up your mild hand
And bless the poor people who work in this land
With all of your sweetest abundance!
Should cod-fishing fail us, what then would there be
To buy for in Bergen for you and for me?
Our crafts would be sailing quite empty.

Petter Dass writes that cod is the king of other fish because it is clearly the most important species of fish for the Norwegian fishermen, but the comparison of the cod to a king also appears under other circumstances. Individual cod may sometimes be affected by a rare genetic defect that prevents the upper jaw of the cod from growing to its full length and its head acquires a bulky appearance. The bulky head of the cod gave it the appearance of wearing a crown on its head and in Norway these particular cod were called king cod. It was believed that they were the leaders of the shoals of cod. If fishermen were lucky enough to catch one of these rare king cods, they dried it and brought it with them out to sea. It was believed that the king cod would attract other cod and bring the



SCHONLANDIA, SEBASTIAN MÜNSTER, 1540. ON THIS MAP BOTH «TERRA BACCALAO» AND «STOCKFISH» APPEAR.



KING COD

SEA MONSTER IN OLAUS MAGNUS'S *HISTORIA DE GENTIBUS SEPTENTRIONALIBUS*, 1555

fishermen better fishing luck. King cods were also called «bulldog» cod. The deformed head of the cod also attracted the interest of world-leading scientists. One example here is the American naturalist and anatomist Jeffries Wyman (1814–1874) who in September 1860 wrote a letter to Charles Darwin (1809–1882) telling him about different animals he had found with skull deformities and he continues:

> What gave me especial interest in it however was, that several years since during an excursion to Labrador I found that a similar monstrosity was occasionally met within the Cod fish & is sufficiently common to be known among fishermen as the «bull dog cod». I procured two specimens of it & prepared the heads, which present deviations analogous to those of the nāta, viz an arrest of the development of the upper jaw. Among the things brought with me from S. America was the skull of a nāta, which shows very well its osteological peculiarities.

A couple of weeks later Charles Darwin answers him:

> As I am asking questions, I will ask one other; viz were you struck with any peculiarity in length of hind (?) legs (I am writing away from home, & cannot consult my notes) of the Nāta cattle? I procured a skull; but it has never been described: would it not be worth your while to insert in some Journal a short description together with the parallel case of the Cod Fish? If you do will you inform me.[3]

KING COD AND WEATHER FORECAST

Throughout the centuries good weather has been important both with regard to safety at sea and being able to fish efficiently. Today we can trust that our weather forecast will not be too far off the mark, but a couple of hundred years ago people sought signs from nature to predict the weather. The king cod was not only believed to bring good fortune in fishing but was used to predict a change in the weather. This was done by attaching a small woollen string to a dried king cod and if it began to move (which was caused by the woollen line absorbing moisture) this was read as a prediction of a change in weather. Fishermen had also other ways to predict the weather. Olaus Magnus[4] writes that the fur from sea calves could be used for this purpose. If the clothes that were made out of such fur remained slick and smooth, the fishermen could expect smooth sailing; however, if the fur was ruffled, rough weather and storms could be expected. Except for our modern technological development for predicting the weather, humans are otherwise quite poorly developed in this regard. In contrast, animals are quite proficient at weather forecasting. One example here is that sharks save themselves well ahead of time from approaching storms by swimming into the safe, deeper waters in response to a drop in barometric pressure.[5]

COD CONSUMPTION

In Medieval times Christian religion imposed strict guidelines for days and periods of fasting. There were also restrictions on what one could and could not eat and meat was forbidden during fasting. However, fish was not regarded as meat and could be eaten. Because of this, the taxonomic classification of fish was extended to include all creatures living in water, and therefore even ducks, which swam on the water surface, were included as fish.[6] So why did the church accept that people could eat fish during Lent? It was believed that fish had escaped God's curse on the earth by living in water. Water itself was believed to be an element of holy purity because during Noah's flood it helped to wash away the sins of the terrestrial world.[7] To allow people to eat fish was a cunning plan on the part of the church, which by introducing a toll on ships that passed by their churches and monasteries became quite wealthy during the time of fasting.

Because of this fish could be very expensive during the times of the year when people were fasting and especially during Lent, the six-week period of fasting before Easter. If people could afford it, they bought large stocks of fish in the autumn when it was cheaper. The fish were preserved by drying and salting, making long-distance transport possible as well as long storage periods.

In Portugal the salted and dried cod was very popular and a very famous dish was invented there called «Baccalao». A Portuguese explorer named João Vaz Corte-Real told people that he had discovered the land of the cod, «Terra Nova do Bacalhau». He was honoured by the Portuguese king for his achievements and given a piece of land as a reward. In Sebastian Münster's map from 1540, one part of Greenland is named «Terra noua siue de Bacolhos». It has, however, been speculated that the island that João Vaz Corte-Real found was actually Newfoundland, though this has never been verified.

THE COD STOCK – OVERFISHING AND GLOBAL WARMING

In a study by Oeierstad in 1994, fishing catch records from 1550–1960 for the Northeast Arctic cod were compared. He observed that the cod population had gone through a large fluctuation in stock size during the period 1550–1850. He also reports that the fished cod increased from 10 000 tons of cod in 1590 to 1.2 million tons in the 1960s. The more modest fishing techniques compared to our modern, high technology fishing vessels is certainly one probable explanation for the low exploitation of the cod population during the Little Ice Age. But modern fishing techniques have unfortunately led to an overexploitation of our cod resources. This, in combination with the threat of global warming, may be having a negative impact on the cod population.

In addition, it was shown that catches generally tended to decrease during colder periods.[8] Although the study shows that the number of fishing vessels was stable under the entire period, it must be taken into account that under colder weather conditions fisheries may be less productive because of the difficulties in fishing, thus the catch do not always indicate the true number of cod that live in the wild. Moreover, based on historical catch and temperature data from around

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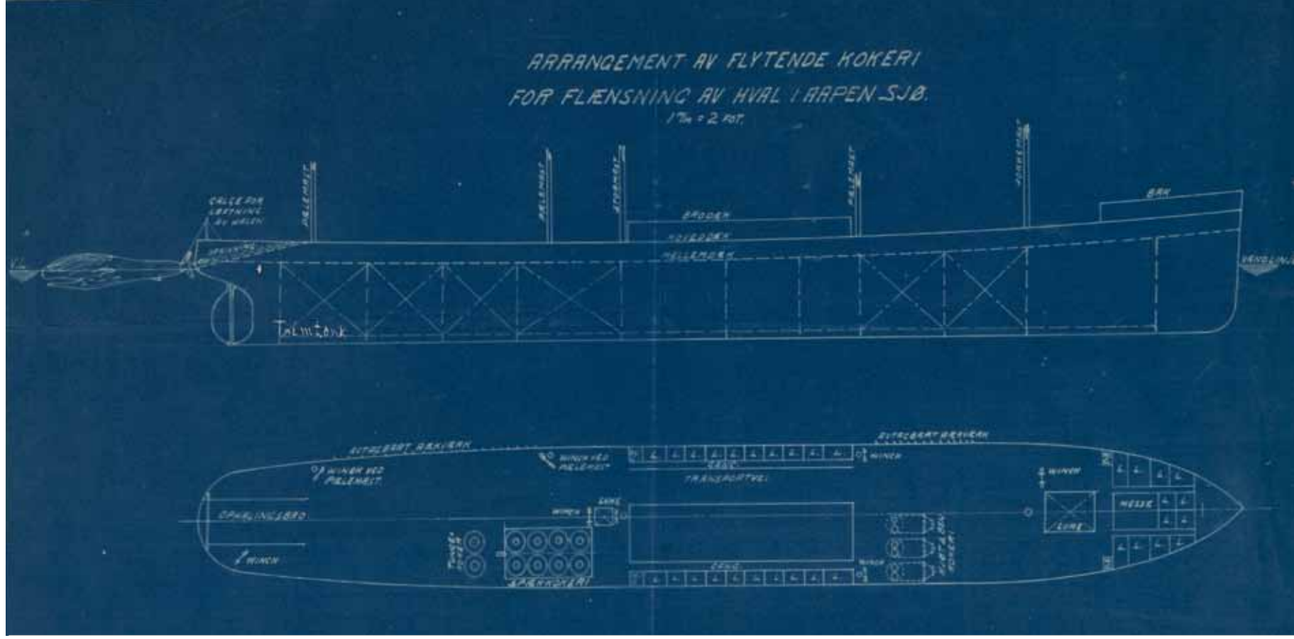
THE OUTLINE OF THE YOUNG KILLER WHALE ORCA GLADIATOR, TO THE LEFT IN THE ILLUSTRATION, WAS DRAWN BY THE FAMOUS NORWEGIAN PROFESSOR GEORG OSSIAN, FURTHER DETAILS BY O. BERGH.



EXAMPLE OF AN EFFICIENT WHALING VESSEL IN THE 20TH CENTURY

and in the Barents Sea, it has been shown that both follow cyclic changes, with a correlation between catch data and temperature.[9]

In Petter Dass' *The trumpet of Nordland* he expresses his worries about what would happen to people if the cod were to disappear. Today, 400 years later, we are actually facing this reality: the cod is struggling for survival. The cod have been overexploited in the North Sea since the late 1960s and after the collapse of the cod population outside the Grand Banks in Canada in 1992, a report published five years later in the prestigious journal *Nature* expressed concerns about a potential collapse of the North Sea cod as well.[10] English fishermen caught only 13 305 tons of cod in the North Sea,[11] because despite their modern fishing vessels they could not find the cod. According to the World Wide Fund for Nature (WWF), the cod population in 2000 had been diminished by 70 percent during the past 30 years. This lead to WWF putting cod on the list of endangered species, with the exception of the cod living in the Barents Sea, which appeared to be a healthy population.

Because fisheries' resources are common property with no clear boundaries, the harvest is hard to estimate and regulate. In 2004 a cod recovery programme was implemented by the European Union, aiming to return the cod stock in the North Sea to safe levels in a few years. Although the overexploitation by fishing is considered to be the main reason for the decline in cod stock, global warming is also a large threat to the cod population. The temperature in the North Sea has increased since the 1980s and is continuing to rise. Although we know that cod is dependent on cold water for reproduction, studies have shown that cod seem to be able to adapt to warmer temperatures and this study suggests that researchers may underestimate certain species' environmental adaptability.[12] We know that the rising temperature of the North Sea has a correlation with a northern shift in the distribution of the cod. It is believed that this shift is a biological response to a shift in its food supply, as a result of the warmer water.[13] But not everyone agrees that this is the explanation for the shift in the distribution.[14] Historical catch data for Atlantic Salmon (*Salmo salar*), cod (*Gadus morhua*) and halibut (*Hippoglossus hippoglossus*) have been used to track the climatic influences on fish populations from the White and Barents Sea fisheries in the 17th and 18th centuries.[15] From that study it may be concluded, with supporting findings from Garrond and Schumacher,[16] that the Atlantic cod is affected differently in different parts of its distribution range. Thus, warm periods are favourable for northern populations because the abundance of food increases when the temperature rises, but in contrast warmer waters have been found to be stressful for southern populations.[17] In 2007 both scientists and fishermen agreed that the cod in the North Sea is actually recovering at last.[18]

FISHING AMONG MONSTERS AND WHALES

In the Middle Ages maps were often richly illustrated with sea monsters. Myths and facts about animals were tightly entangled and fishermen probably feared the sea serpents that they believed to be lurking under the surface. Olaus Magnus describes the immense size of the Norwegian serpents:

> Those who do their work aboard ship off the shores of Norway, either in trading or fishing, give unanimous testimony to something utterly astounding: a serpent of gigantic bulk, at least two hundred feet long and twenty feet thick, frequents the cliffs and hollows of the seacoast near Bergen. It leaves its caves in order to devour calves, sheep and pigs, though only during the bright summer nights, or swims through the sea to batten on octopus, lobsters, and other crustaceans. It has hairs eighteen inches long hanging from its neck, sharp, black scales, and flaming-red eyes.[19]

He also writes that for fishermen the appearance of serpents foretold the occurrence of some kind of change, or the breakout of violence or a war. Olaus Magnus' contemporary, Konrad Gesner, was a Swiss naturalist and bibliographer, famous for his great zoological work *Historiae animalium,* which is considered the beginning of modern zoology. In his five-volume encyclopaedia he describes mythological animals as well as existing ones. It shows that it is hard to prove that things do not exist. He describes different kinds of serpents and he refers to Olaus Magnus' description of the serpents. He concurs that they exist but with one qualification: that Olaus Magnus probably must have exaggerated the size of the Norwegian serpent!

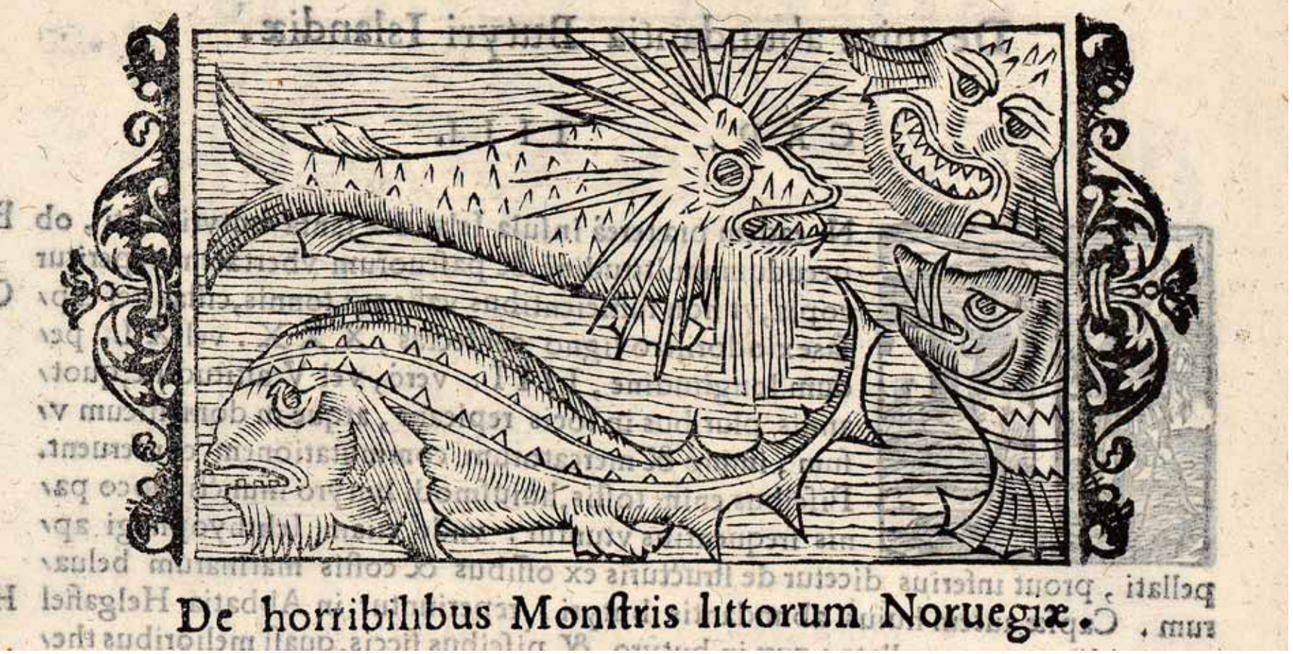
Also Petter Dass was fascinated by the sea serpents that lurked under the surface of the sea and he writes:

> Of sea-serpents, truly, I know not too much.
> My eyes never saw or came near any such,
> And do not desire such an honour.
>
> Yet many a man whose good word I esteem
> Have told me in truth, as I fully must deem,
> The serpent must be quite a monster. [...]
> How fearfully large this dread creature can be
> Is told by the men who were near and could see;
> They tell of colossal dimensions.[20]

Today we know that sea serpents do not exist other than in fairy tales. However, we do know that whales exist. It is not surprising that the scientific name of the order of animals that includes whales, dolphins and porpoises is Cetacea, which comes from the Latin word *cetus*, meaning a large marine creature or sea monster.

Jens Munk (1579–1628) was probably Scandinavia's first great polar explorer. He was famous for his efforts to try to find a shortcut to Asia. Already when he was twelve years of age he set out on his first trip to sea. In the book *An Account of a most Dangerous voyage performed by the famous Captain John Monck*,[21] he describes whale fishing in Nordic waters. In those days whale fishing was very different from today.

A few centuries later a Norwegian whaling captain Svend Foyn (1809–1894) invented the exploding harpoon that would change the process



MONSTER FISH IN OLAUS MAGNUS' *HISTORIA DE GENTIBUS SEPTENTRIONALIBUS*, 1555

of whaling forever.[22] In addition, he introduced steam-powered whale catchers, and put Norway on the map as the leading figure in the whaling industry. The new, mechanized whale-catching technique made it possible to hunt the largest group of baleen whales. It is to this group that the blue whale belongs, which with its 30 meters in length and 130 tons in weight is the biggest animal ever to have lived on the planet earth. Despite its gigantic size however, we know very little about it, and no one knows for example where it breeds. The blue whale is one of the fastest swimmers among marine animals and its speed protected it from the whale catchers for centuries before the steam-powered whale catchers were introduced. This brought the blue whales, along with a few other species, close to extinction. It has been estimated that more whales were killed between the first 40 years after the introduction of the new efficient boats and harpoons than were killed during the previous 400 years with the hand-held harpoons. The new technological development launched Norway into a new and profitable industry at the cost of a massive decline in whale populations.

In 1946 the International Whaling Commission (IWC) was established to protect whale populations around the world by introducing catch limits for the whaling countries. Despite this, the decline continued to plummet and in the 1960s many countries began to quit whaling.

It is ironic that while in 1555 Olaus Magnus wrote about what terrifying monsters whales were at the time, man has now become their biggest threat to survival only a few centuries later:

> Off the coasts or out in the Norwegian Sea are found monster fish with strange names (though they are reckoned to be species of whale). Their savageness is apparent at first glimpse, since they cause spectators to tremble and anyone who gazes longer at them grows terrified and numb. In shape they are dreadful, for they have square heads armed everywhere with sharp spines and surrounded by long horns like the roots of an upturned tree. These heads are fifteen to eighteen feet long, jet black, and set with huge globular eyes, which are at least twelve to fifteen feet in circumference. The pupil, eighteen inches in diameter, is coloured a flaming red and during the hours of darkness it seems to far-off fishermen like a blazing fire amid the waves.[23]

The whaling industry at the beginning of our century had a severe impact on whale populations globally. As a consequence of the expansion in the Norwegian whaling industry a hundred years ago, the Natural History Collections in Bergen had the opportunity to collect whale skeletons and has one of the largest collections of whale bones in the world today.[24] This collection is predominantly of importance to science and has contributed to the knowledge of the pelvic anatomy of whales. This area of research is important when showing how evolution has transformed different body parts in animals due to changes in lifestyle. The ancestors of the modern whales formerly lived on land and walked on four legs.

One of the earliest works on pelvic anatomy in whales was written by O. Abel, who was a professor in Vienna. He used material from the Natural History Collections in Bergen when he in 1907 wrote *Die Morphologie der Hüftbeinrudimente der Cetaceen* that was published in Vienna. Gustav Guldberg (1854–1908) was a Norwegian anatomist who later became a professor of anatomy at the Karolinska Institute in Stockholm, as well as at the Anatomical Institute in Oslo. He was interested in the whale from the Natural History Collections in Bergen and together with Professor Fridtjof Nansen they published *Historical survey of the knowledge regarding the development of the whale* in 1894. In his preface he writes that it was his friend Dr. Fridtjof Nansen who had invited him to take part in the project of studying whale foetuses from the Natural History Collections in Bergen. However, because Nansen was occupied with preparations for his polar expedition that he started in 1893, he left the work to be finished by Gustaf Guldberg. Guldberg was able to show the existence of rudimentary hind limbs in a few small embryos of the species *Phocæna communis*. He mentions that he also spoke of this discovery at the Anatomical Congress in Strasburg in 1894. When Guldberg made his discoveries it was not generally accepted in the scientific community that whales could have once had hind feet. It would not be until a hundred years later, on an excavation in the Egyptian desert, that scientists would excavate the first fossil evidence proving that whales once had feet.[25]

The killer whale is a common whale in the Norwegian waters. However, this species of whale attracted much attention a couple of years ago. Keiko was the name of the killer whale that starred in the first of three *Free Willy* movies in 1993. He was captured in 1979 off of Iceland and sold to different amusement parks where he entertained the public. The enormous publicity from his role in *Free Willy* led to an effort to find him better living conditions and in 1995 the Free Willy Keiko Foundation was established. Millions of dollars were collected from donations and spent to restore his health and eventually also to return him to nature. The release was a failure as Keiko had severe difficulties in being accepted by other killer whales; he kept to himself, remaining dependent on humans for survival. He lost weight and finally died of pneumonia in December 2003 in Taknes Bay in Norway. The Hollywood production *Free Willy* became the beginning of a long sentimental story in modern times. People wanted the happy ending from the movie that reality had not given them. Keiko became a legend and perhaps also a modern whale myth because fiction and reality did not match.

IN CONCLUSION

Centuries ago man did not have the same knowledge about nature as he has today. Instead, myths and beliefs were incorporated and mixed with reality. Today we have penetrated a great deal of the mysteries of nature, but unfortunately our scientific revolution is a double-edged sword. Our rapid progress has also contributed to an overexploitation of our natural resources. The decline in the number of cod and different species of whales during the last decade is a striking example of this.

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