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SEA MONSTERS AND CETACEANS: SLOW EMERGENCE OF SCIENCE AND PERSISTENCE OF IMAGINATION



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INTRODUCTION

Nowadays, the shape and external anatomy of most cetaceans are supposed to be well known, even if the smallest details of all species are not yet precisely described. However, we can point out how surpris-

ingly fanciful some representations can be, even until in the last years, including in scientific drawing.

EARLY CONCEPTIONS

In the early Mediterranean Sea, dolphins were often drawn, because they were common animals. As far as they are rather small, they don't threaten fishermen, and are even supposed to be friendly because they can be seen on the fishing zones. Most of the legends are very positive: Arion saved by a dolphin, or such other stories all over the world; in some civilization, drowned men are said to be reincarnated as dolphins, so that it's a crime to kill them. They are bigger than most fishes, but considered as much more intelligent, and often seem to play with boats.

The correctness of representation of dolphins is facilitated by this general friendly attitude. Hence dolphins have been rather exactly drawn since a long time (Fig.1), maybe also because stranded animals are quite similar to living ones.

However, early Mediterranean people worshipped sea creatures, some as friendly spirits and some as hostile ones, in a propitiatory way.

Unlike dolphins, whales are not common close to the shore. Early Greek and Roman fishermen didn't see them often, and thus didn't know them well. Their size could be terrific, and the size of their mouth or their fluke led to suspicious attitudes towards them. Lucian of Samosata (2nd AD) tells the story of a ship swallowed by a colossal whale, in which some people was already living and even growing vegetables.

The huge size of whales caught imagination.



Fig 1 : Exekias dish

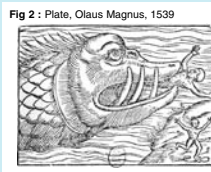


Fig 2 : Plate, Olaus Magnus, 1539



Fig 3 : Plate, Olaus Magnus, 1539



Fig 4 : Belon, Neptune's horse

MONSTERS

A lot of maps represent whales in the seas, but their shape is curious, and those drawing are out of proportion to countries or ships: some "monsters" are longer than the half way between Europe and America. The excessive length may signify its extraordinary danger or the high number of these creatures to be found across the sea. (Fig.2) But a lot of strange creatures began to appear at the right moment European people start crossing oceans all over the world. Sailing towards unknown regions, they met unknown and actually big whales: the middle age even creates island-whales. Furthermore, people at this period liked monsters and marvels and imagine a lot of fabulous creatures living in oceans, as the Bible had said (Fig.3). The sea snake has got a great success, as well as the marine cow: all of them are of great narrative interest for travel writers, especially during long and monotonous journeys. Even objective travellers like Léry (in 1578) can describe dolphins and whales, mixing real observations and representations coming from the science of his age.

Fig 5 : Belon, curved dolphin



Fig 6 : Belon, dolphin



Fig 7 : Belon, porpoise



WHY DO SUCH REPRESENTATIONS PERSIST? THE PROCESS OF SCIENCE

The persistence of errors in science may be due to the way scientists have always been working. Knowledge can be gained essentially by two methods: on one hand observing directly things or living creatures, on the other hand compiling available science. Aristotle (4th BC) had maybe discovered or more probably made know the state of early Greek science. His survey was so complete and convincing that scientists took over him, more or less without questioning his assertions: in fact, he was generally right, for example classifying whales as mammals. Compilation being so common – for description and analyse –, proceedings of scientists had been for a very long time indebted to Aristotle, his account often taking precedence over observations and evidence.

At the time of Renaissance, science had encyclopaedic aims: natural history tried to be exhaustive, and in order to describe an animal for example, attempted to gather everything concerning him: history, shape, habits, nutrition, reproduction, ecology, but also human uses of it – including for food –, and all fictions or legends about it. That's why scientists could present the same way what they think to be right and what had been held for correct for a long time, even if they knew that this early conception was wrong.

Belon, beside Rondelet, was the first great "modern" scientist in sea animals. In his *Natural History of strange sea fishes, including the right description of the Dolphin* (1551), he used the word "cetaceans", but ranked whales among fishes, crocodiles and hippopotamus, because of their aquatic or amphibious life; his second book *Nature and diversity of fishes* (Latin edition 1553-French 1555) is divided in two parts: in the first one, "fishes with blood", in the second one, "fishes without blood". For him, fish is "every animal living beside or in water", cetaceans, turtles, beavers, otters, shellfishes, and so on. Cetaceans are naturally depicted in the first chapter, but Belon explained and drew at the same time the real shape of dolphin, whale, porpoise, and the shape of the dolphin "as the early Greeks and Romans pictured it": drawing a curved dolphin Belon explained how possible it was to imagine bowed dolphins: "I wanted to take stock of the curve of dolphins. Because they aren't curved themselves, as they are painted, and neither Aristotle nor any ancient credible writer ever wrote that dolphins were bent. [...] The error is due to the fact that you often see them jump, [...] they come out of the sea, very strongly and impetuously, they first put the head out, and when they fall again, they are very far from where they had jumped out, and they fall right on the head, while their fluke is still visible for a moment out of the water. And because you saw their jump like a bow with the perspective, you may think that the semicircle is the shape of their body. But it's false. [...] If dolphins were curved at sea, they would be so when they are stranded." He could conclude that if painters wanted to draw dolphins bent, they might do it, but that figure had nothing to do with the reality. (Fig.5)

Another chapter of the *Natural History of strange sea fishes* concerns the way "modern painters of dolphins don't worry at all about natural shape, but represent sea monsters": according to Belon, this fancy took official painters who used dolphins for armoures or medals: for this symbolic and aesthetic representation, reality was not called into question. (Fig.6)(Fig.7)

Moreover, Belon explained that dolphin is naturally rather devoid of interest, being covered by grey or black and white leather, without any bright colours or any picturesque ornament. That's why artists changed their appearance, in order to make a beautiful and more colourful picture. So, such painted dolphins are sometimes monsters, being more interesting in this way.

Belon pointed out the bad habit of giving to marine creatures the names of terrestrial animals: according to him, it's the origin of numerous absurd representations: horse, dog, cow, and so on. Belon showed the "fabulous Neptune's horse" as it was usually figured (Fig.4), between real animals, porpoise or seal, but explained that that a hippocampus is, in fact, tiny and completely different.

DIFFICULTIES OF REPRESENTATION

Thus, from that moment, persisting errors are the result of other difficulties and ignorance.

First of all, such marine animals spend more time under water than at the surface: they are difficult to see in details. One can't be sure to notice all the characteristic features during the very short moment one sees them, especially if the back only is in surface: one must imagine the other parts of a fleeting shadow. Some cetaceans use to jump, or like to follow the ships: they can be more easily seen, but, as Belon accurately noticed, the view is perturbed by perspective. Some are so rare that they are described according to only one or two evidences.

On the plates, however, cetaceans are often drawn like terrestrial animals, with a line under them which represents a sort of floor: it's difficult to draw what you don't see under water. Drawers, picturing according to the stranded animal, hesitate how to show a living animal out of its natural element, exactly like "a fish out the water".

Stranded dolphins are not very different from living ones, but whales, due to their mass, are distorted, so than it's may be difficult to imagine their real shape; tongue and penis are sticked out, so some naturalists (like Fleureau in 1797, following Bonaterre) wondered how little hydrodynamic they are. (Fig.13)

Whales are often drawn with a very round body, like on Lacépède's plates. (Fig.12) This balloon-like appearance can be explained by the way they were pictured "in the natural state", but stranded: the decomposition may be causing gases inflate the corpse.

The pictures being often copied from a book to another, no wonder that this type of representation may seem anachronistic, and persists still now, in the case the author has no way to substitute a better drawing to the previous imperfect plate.

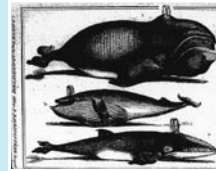


Fig 12 : Lacépède, right, humPback, fin whale



Fig 13 : Distorted stranded whale

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Fig 8 : Belon, strange sperm whale



Fig 9 : Lacépède, sperm whale



Fig 10 : Lacépède, narwhal, killer whale, fin whale

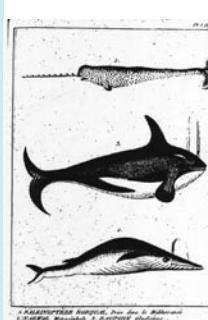
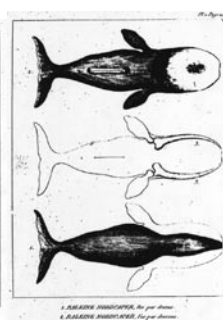


Fig 11 : Lacépède, osteology



EVOLUTION OF SCIENCE: THE SCARCE, THE STRANGER

Belon and Rondelet – who told about whales in *Fishes* (1555) –, were good observers of the natural shape of cetaceans and their account was not outside their scope. Their classification itself was organizing the actual knowledge. Scientists in the following centuries developed a wider range of cetaceans: nevertheless, some species are so scarce that the representation can't be only probable.

Scientists during and after the 18th century tried to get progressively rid of fabulous creatures and evident mistakes. But they went on giving credit to some previous conceptions. (Fig.8)

Lacépède for example published in 1804 the *Natural history of cetaceans*, aiming a general view of all the cetaceans who have never been seen until that moment, one species after the other, using the classification Liné had proposed, in *Systema naturae* (10th edition in 1758), on anatomic – and no longer ecological – bases (with two orders: cetaceans without teeth, cetaceans with teeth). But Lacépède particularly persisted in imagining cetaceans with extraordinary life expectancy, length and fertility, and other aspects of their anatomy or habits. (Fig.10)

The last wrong and widely spread belief concerns whales blowing. Belon had definitely established that whales or dolphins didn't have horns on the forehead, as sorts of chimneys for breathing. But Lacépède still believed that cetaceans throw water by their blowholes – and persisted in picturing them with a little fountain on top of the head – and so does everyone until the end of the 19th century. In 1878 Jules Verne still explained that point in a novel based on contemporaneous science (*A fifteen years old Captain*). (Fig.9)

Melville, in *Moby Dick* (1851), presented the adventure of Captain Ahab and Ishmael from the whaler's point of view; besides a symbolic interpretation and some chapters dedicated to general observations on cetaceans, Melville related the slaughtering of sperm whales: this way of approaching whales has been, in fact, the main obsession of the 19th century, up to about 1950. Pseudo-scientific description interfered in the whaling, but sounded like a pretext, observations concerning essentially whales' size (as a sign of profitability) and ability to escape far away or to defend themselves to the whalers cost. (Fig.11) Actually science didn't progress a lot with whaling reports, as is still the case nowadays.

And yet, Fleureau in the Marchand's *Voyage around the world* had already gathered a little encyclopaedia for mariners, so that they could observe more accurately and give in turn useful data to scientists.