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The role of cryptozoology in achieving an exhaustive inventory of the marine fauna*

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The Sea has played a vital role in the development of many areas of Science. Its rich and varied fauna has provided naturalists with clues from which they have been able to make sense of the diversity of life. The shape of the ocean basins and of the great ridges which traverse them has led to the development of plate tectonics and to a new understanding of the Earth's crust.

In recent years, there has been increased emphasis on the exploitation of the Ocean, with concerns focusing on the quantitative aspects of marine biology. Questions such as "How many?" rather than "What kind?" of marine organisms have come to the fore.

Have we now perhaps left behind the Age of Exploration to enter that of Exploitation of the Sea? Not entirely. The ocean depths retain much of their mystery and continue to attract daring explorers and broad public interest. Millions thrill with Jacques Cousteau in watching an undersea world where there always seems to be something new to be discovered.

But, is there *really* anything worthwhile left to be discovered in the ocean? In this age of electronic in-situ sampling, deep-diving submersibles, remote sensing and computer modelling, can there be anything *significant* left to find? Have we not by now explored the oceans widely and thoroughly enough that only matters of detail or of complexity need be settled?

Most oceanographers would argue that our knowledge of the oceans is still incomplete and superficial, that much remains to be discovered and clarified in flow dynamics, fish behaviour, ecological relationships,

tectonic processes, climatic mechanisms, etc... Thousands of marine scientists around the world wouldn't be exploring and studying the ocean with such dedication if they did not believe that something important remains to be discovered!

One should thus have little difficulty in convincing a scientific audience that great discoveries are still to be made in many fields of marine sciences. To explore the broader aspects of future discovery in marine sciences is however a challenge which I will leave for some other occasion. Rather, I have selected a more specific, and more controversial question which exemplifies many of the points related to the anticipation of potential discovery.

The question asked here is the following: Are there any important elements of the marine fauna left to be discovered? In other words, are there still any large, or new, or unexpected animals in the oceans which remain to this day unknown to science? And if so, how many?

Many have answered the general question in the affirmative, and some, like HEUVELMANS (1983), have even ventured to extrapolate from historical rates of discovery

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to obtain an estimate of the number of future discoveries to be expected. Let us refrain from searching for a definite answer to the question: we cannot positively know that there are undiscovered animals until they are actually found, identified and categorized to the general satisfaction of the scientific community. Asking the question nevertheless forces us to consider the process whereby new elements of the marine fauna are become known to science.

Most, if not all, marine animals have been discovered by accident, through man's efforts at fishing. As its diversity has revealed itself, the marine fauna has been catalogued and apportioned in families, classes and phyla. As in other areas of science, improvements in sampling and harvesting methods have led to unsuspected discoveries: new animals have been added to the marine bestiary. Deep submersibles, for example, have made detailed visual exploration of the ocean floor possible, leading to the discovery of a completely unexpected fauna near deep sea thermal vents. PARSONS (1985) has emphasized the need to explore for the sake of discovery in order to broaden our knowledge of the oceans. His remarks apply directly to the discovery of new marine creatures.

Occasionally, there have also occurred significant and surprising discoveries unrelated to the development of new observational methods. The coelacanth, *Latimeria chalumnae*, had already been fished up many times from the mid-depths of the Indian Ocean by Comoro Island natives before a specimen came to the attention of Marjorie Courtenary-Latimer in 1938 (SMITH, 1956; COURTENARY-LATIMER, 1979). Because of its kinship to primitive fishes known only from the fossil record, its modern discovery attracted considerable attention. The megamouth shark, *Megachasma pelagios*, (TAYLOR *et al.*, 1983) on the other hand did not have a fossil pedigree. The first specimen was brought up in 1976 tangled in the anchor chain of a US Navy ship in Hawaii. Two more specimens have since been found, one off California, the other off western Australia, suggesting a global distribution (ISC, 1988).

In the face of such unexpected discoveries, and considering the prospects for improvement in techniques of observing and sampling the oceans, it would seem presumptuous to declare that no further discoveries are to be expected. We are thus back to the question: "How many?"

One might argue that on the time scale of modern scientific discovery, there is a fixed and finite number of animal species in the oceans. The more have been discovered, the less there remains to be found. That is however of little use since the total remains unknown, and hence so does the residue. Beyond the arguments of plausibility based on expectations of better sampling and on past accidental discoveries, there are however observations which point towards the possibility of additional discoveries and give hints as to their nature.

A definite addition to the fauna is made by catching an animal. But what if the animal is only seen, not caught? How do we account for those that get away? Most zoologists would rather discard near misses and wait until a tangible type-specimen is available to pronounce on species and genus. Until caught, a creature remains a rumour, an unconfirmed visual observation, not yet the object of zoology, but rather that of **cryptozoology**.

The term **cryptozoology** was coined by the French zoologist Bernard Heuvelmans in the 1950's (HEUVELMANS, 1982) to describe the study of creatures which are known only through visual or incomplete material evidence. Such animals are also called cryptids, a more appropriate term than monsters; the term is usually reserved for rather large creatures, observable at sea without instrumentation. Cryptids are often well known to natives before attracting the attention of science: such was the case for the coelacanth. Sometimes scientists are awarded a fleeting glimpse of an animal which they can only describe without being able to collect a specimen. This is what happened to MEADE-WALDO and NICOLL (1906) as they saw an unidentified marine animal with a long neck

and a large dorsal fin swim past their ship off the coast of Brazil.

Cryptids provide a clue of what is to be expected in terms of future discoveries, at least for rather large animals. Indeed some erstwhile cryptids have already graduated to zoological acceptance. There are many examples on land: the gorilla, the okapi, the platypus. A marine example is the giant squid *Architeuthis*, the Kraken of Norse mythology, now known from many strandings.

So, what does cryptozoology tell us? HEUVELMANS (1986) has brought together a checklist of unknown animals, the result of three decades of research on eye-witness reports. Marine cryptids figure prominently. What follows is drawn from HEUVELMANS' (1986) list; further documentation if found in HEUVELMANS (1968).

Unconfirmed cetaceans lead the list of marine animals for which no specimens have been captured. A high-finned sperm-whale, 60 feet in length, is said to have been frequently seen around the Shetland Islands in the 17th century. It is reported by Sir Robert Sibbald, and described by him as *Physeter tursio* (HEUVELMANS, 1986). Another long-finned whale, 20-30 feet long, was reported by WILSON (1907) who saw three specimens in January 1902 and four more the following month while on Robert Scott's *Discovery* expedition in the Antarctic.

It is not surprising to find a possible new species of beaked whales in the list. A number of beaked whales, the Mesoplodons in particular (WATSON, 1981), are known only from a few strandings and are difficult to identify at sea. HEUVELMANS (1968) quotes P.H. Gosse as having watched a school of 30 ft long, yet unidentified whales, black above and white below, in the North Atlantic over a century ago.

HEUVELMANS also includes a new kind of killer whale, entirely sepia brown with star-shaped scars, sighted several times in the Gulf of Aden by MORZER BRUYNS (1971). The same author mentions three dolphins, one from the Mediterranean, one from the coast of Senegal, and one from the Philippines. A black and white spotted dolphin with *two* dorsal fins has also been reported from the Mediterranean and from the Southern Ocean (HEUVELMANS, 1968).

Tales of less conventional creatures are also to be expected: the undiscovered is bound to be strange. "Mermaids" and "mermen" are mentioned by HEUVELMANS (1986) as having been frequently reported from areas where no recent species of sirenians are known to have lived during historical times. Rumours of survival of Steller's sea-cow (*Hydrodamalis gigas*) continue to be heard along the Bering Sea shores. Both MACKAL (1980) and HEUVELMANS mention the "sea-ape", a creature seen off the Aleutian Islands by Steller in 1741.

Reports of large, mostly elongated marine animals usually referred to as sea-serpents have been classified by HEUVELMANS (1968) into seven categories corresponding to their morphological characteristics: the super-otter, the many-humped sea-serpent, the long-necked sea-lion, the merhorse and a many finned, armoured archeocete—all mammals—with a huge ocean-dwelling saurian and a large eel-like fish in addition. HEUVELMANS examined over 600 reports to arrive at his classification. A more localized survey on the western coast of North America (LEBLOND and SIBERT, 1973) identified three types of marine cryptids: two of them variants of Heuvelmans' merhorse, the other an elogated creature, all three apparently air breathers and mammalian.

Finally, there are the reports of giant octopus, focusing on a mysterious standing on a Florida beach at the end of the last century (see also MACKAL, 1980).

If only a fraction of these reports is based on fact, there remains a rich harvest of discovery of major faunistic elements in the world ocean. However, because all these observations are based only on eye-witness reports and cannot be backed by tangible specimens, their status remains doubtful. Cryptozoological evidence is subjective and non-reproducible. While there is no a priori reason to reject as fanciful every shred of visual information, the scientific method has

gained respect as a method of arriving at universally accepted truths precisely because it deals with objective and reproducible evidence. Cryptozoology should thus perhaps be seen as a precursor of zoology, arriving at its conclusions earlier, but with less confidence. One should thus not conclude that the various cryptids glimpsed in the sea must all be discovered some day; some may, others may not. Cryptozoology only provides clues as to what may yet be confirmed; it is like a road map based on hear-say: better than nothing, but not entirely to be trusted.

Cryptozoological information should thus be seen as an adjunct to zoological discovery; not a body of information which is to be believed or disbelieved, but a collection of indices which should not be ignored and which may inspire and guide marine scientists in their effort to complete the inventory of the larger elements of the marine fauna. There is no such guide for small or microscopic creatures, where the need for exploratory research is even more acute.

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