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Foreword

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As a very junior officer on a conventional submarine, it did not take me long to find my favorite spot on board: the Sonar Room, the interface with the outside world. Side by side with the sonar operator, I would listen for long periods to the sounds around us. It was not difficult to distinguish between the "human-made" noise, like ships' propellers or the occasional seismological survey, and the mysterious and fascinating sounds in the impenetrable blue and black waterworld around us, like whalesong or the chattering of dolphins. We felt a lot of sympathy for the creatures that produced these sounds; after all, it was their environment and we were uninvited guests. Furthermore, the designers of our boats had done their best to resemble their shapes. We even borrowed their names: Dolphin, Finwhale, Cachalot, and many varieties of the same in different languages. What were they trying to say to each other? Or to us? Would we ever be smart enough to understand their language? Would it be worth the effort?

A surface ship gives itself away to a submariner without too many complications: one can easily tell its mode of propulsion, the number of its propellers and blades, and its speed by the number of revolutions thereof. Furthermore, even if you lack passive ranging equipment, a little bit of smart manoeuvring and expert guesswork will give you a surface ship's distance and course. That is pretty much all there is to know of a surface target from a submariner's point of view. And all that information comes at a comfortable depth, without having to use your active sonar or periscope, but of course, making optimum use of the physical parameters of the environment as expressed in the sonar equation, enhanced by clever signal-processing.

The challenge that is posed to the navies of the world to detect submarines is much more complicated. There is no easy way to "make the oceans transparent," and it is a safe bet that using acoustic energy will remain one of the more efficient methods, if not the only method, for the foreseeable future. It therefore remains an exceptional challenge to remain loyal to nature and in particular to the creatures that are dependent for their survival on the unhindered use of their natural habitat and indeed of their own acoustic transmissions. Out of the growing awareness of man's obligation to live in harmony with the undersea environment whenever the operational situation allows, Marine Mammal Acoustic Risk Mitigation Programs have gradually found their way into national and international research plans. The vast body of knowledge of physical characteristics of the seas on which we have concentrated our efforts for decades for military purposes, although a valid point of departure for formulating these mitigation policies, has proven not to be enough. We need different kinds of knowledge (i.e., bioacoustics), and above all, we need more cross-fertilization between the various relevant scientific disciplines. And, we need dedication.

I note with great satisfaction that many scientists who are contributing to this Special Issue are the same as those who have helped NATO nations in their early efforts to come to grips with their programs in order to avoid deleterious effects to marine mammals after reports of multiple strandings of Cuvier's beaked whales in the Mediterranean in the late nineties. The nations and their navies owe them their gratitude, as does the environment.