

International Helgoland Symposium
"Diseases of marine organisms":
Opening address

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Ladies and Gentlemen! Colleagues and Friends!

Welcome to Helgoland and welcome to the Federal Republic of Germany! My associates at the Biologische Anstalt Helgoland and I hope that you had a good trip to this island, that you will enjoy your stay here, and that the Symposium will provide a useful basis for the exchange and evaluation of new knowledge and concepts in the field of diseases of marine organisms!

I am glad and grateful that it has been possible to bring together here many of the international elite concerned with disease phenomena in marine waters. In times of severe restrictions on research and travel funds this is not a matter of course. Compared to preceding International Helgoland Symposia, the total number of participants is lower and the countries represented are fewer. However, this does not have to be a disadvantage. The number present of leaders in the field and of researchers with an outstanding reputation is high, possibly higher than at the preceding meetings. There is much muscle and little fat.

I am grateful to the Minister for Research and Technology, Bonn, for supporting this meeting financially; to Dr. K. Anger and Herr J.-K. Holtmann for organisational support; and to the community of Helgoland for cooperation.

HISTORY OF THE INTERNATIONAL HELGOLAND SYMPOSIA

The series of International Helgoland Symposia (IHS) has been created for several reasons: (1) Need for periodical summaries and critical evaluations of the state-of-the-art in important areas of marine ecological research, based on ad-hoc exchange of information and in-depth discussions between peers. (2) Establishment and deepening of professional and personal contacts and ties between scientists from different areas of the world, working on similar projects and in related fields of research. (3) Need to compensate for the relative isolation of our Helgoland colleagues who live on an island some 50 km off the mainland. (4) The unique advantages of Helgoland as a meeting place: conference hall, laboratories, guesthouses, hotels, restaurants are all close together. There is no need to use a bus, a taxi or a subway – indeed, there are none of these

on Helgoland. Once on the island, the participants of a symposium are bound to run into each other time and again. There is no escape, unless one jumps into the sea.

First held at short time intervals of several months or 1 to 2 years, the IHS are now being organized every 3 or 4 years. We have learned our lesson: international symposia of the size and status of IHS require considerable organizational effort for preparation, actual symposium activities, and for publication of the proceedings. The organization of Helgoland Symposia at 1 or 2 year intervals would keep us occupied continually.

The first IHS, held in 1963, was concerned with "Quantitative Biology of Metabolism", a topic suggested by Alfred Locker and Friedrich Krüger. The second symposium, also held in 1963, was devoted to "Biology, Ecology and Physiology of Marine Organisms". The third symposium (1965) continued the topic of the first meeting: "Quantitative Biology of Metabolism". The fourth IHS (1966) – at the same time the First European Symposium on Marine Biology – dealt with three topics: (1) "Experimental Ecology – its Significance as a Marine Biological Tool"; (2) "Subtidal Ecology – Particularly as Studied by Diving Techniques"; (3) "The Food Web in the Sea". The fifth IHS (1967) featured, for the first time, a topic which has remained a dominant theme up to the present time and which is expected to occupy the attention of marine ecologists far into the future: "Biological and Hydrographical Problems of Water Pollution in the North Sea and Adjacent Waters". The sixth IHS (1969) focused on the topic "Cultivation of Marine Organisms and its Importance for Marine Biology"; the seventh (1972) on "Man in the Sea – in situ Studies on Life in Oceans and Coastal Waters"; the eighth (1976) on "Ecosystem Research"; and the ninth (1979) – at the same time the 14th European Marine Biology Symposium – on "Protection of Life in the Sea", thus taking up again the theme of the 1967 meeting. The present symposium, then, is the tenth in this line – and the last one that I shall be responsible for as President. The proceedings of all these symposia have been published in *Helgoländer Meeresuntersuchungen* – in all cases, I might add, within 8 to 10 months after the meeting.

During the two decades of symposium organization, certain procedural patterns have evolved. We now find that a combination of Formal-Paper-Presentations, Informal Sessions and Posters provides a suitable basis for maximizing effective interchange of information, ideas and concepts. While Formal-Paper-Presentations serve – in a storm of often vaguely formulated verbal statements – as a solid framework of essential details regarding methods, data and interpretations, Informal Sessions – convened by invited, experts – give an opportunity for freely-flowing in-depth discussions on selected subsub-topics. Providing the Convenor presents a sound, written report on his or her session, we are prepared to publish this along with the formal papers. Posters, finally, give both authors and their peers a chance for detailed ad hoc explanation and argumentation. In recent years it has – in addition – become an apparently useful custom that the Symposium President attempts to summarize, highlight and evaluate essential aspects of the papers presented. In this way, conclusions can be drawn and a quick overview of a vast amount of information be provided for the benefit of the reader.

SYMPOSIUM TOPIC

This symposium focuses on diseases due to intimately coexisting organisms (parasites) and on environmental stress, including pollution. Other principal disease causes –

such as nutritional disorders, circumstances internal to the individual involved (innate, idiopathic or genetic diseases) and physical injuries – remain largely outside our scope.

The term "disease" has been defined as a "demonstrable negative deviation from the normal state (health) of a living organism" (Kinne, 1980, p. 14)*. In this definition, "negative implies an impairment, quantifiable in terms of a reduction in the ecological potential (e.g. survival, growth, reproduction, energy procurement, stress endurance, competition). The deviation may be functional or structural, or both; it may result from a single cause or from several causes acting in concert." In this sense, "disease" is an ecological phenomenon. It can modify the dynamics of organismic performance and coexistence. When of epizootic proportions, disease of a given organism may also affect members of functionally related species – such as prey, predators or competitors. Hence, in an ecosystem, disease can lead to modifications in organismic distribution and abundance and as a result affect the flow patterns of energy and matter.

For several years now I have insisted, in a number of lectures and publications, that the study of the diseases of marine organisms must become a focal point of marine ecological research. Most of the present knowledge pertinent to our topic has been produced and interpreted by parasitologists and pathologists. They have disclosed important new facts and insights into host-parasite-relations, especially in regard to life cycles, taxonomy and evolution. For the ecologist, a disease is – in addition – a factor which contributes to determining an organism's ultimate potential to endure stress – natural and man-made; to perform as a member of a given ecosystem; and to develop (in the case of a biotic disease) specific, intimate, bi- or oligolateral associations between members of an ecosystem. Associations between agents and hosts provide most interesting ecological models of close-knit ties among individuals, different taxa, and the evolutionary integration of different ecological requirements and potentials (see also "Summary of Symposium Papers and Conclusions", p. 641). Ecologists must attempt to determine and to evaluate the total quantity and quality of the impact encountered by a living system, – natural-environmental, man-made, plus disease-caused. How else can we analyse the forces regulating nature's flow patterns of energy and matter and assess the capacities of populations and ecosystems to counteract, compensate for or tolerate man's increasing impact on nature?

In thousands of experiments and field studies, ecologists have neglected to consider the health status of their study objects. The vast majority of published works concerned with organismic performance under environmental change have been conducted without due consideration of disease phenomena; without providing adequate nutritional and environmental test conditions; and without ensuring that the organisms investigated have been allowed to acclimate fully to the living conditions provided. Such studies are acceptable only as crude assessments, especially with regard to rates of mortality or metabolism of individuals; they are likely to be inadequate for assessing more delicate, but ecologically essential, aspects of organismic performances, such as the population- or species-specific potentials for reproduction and competition and for long-term adjustments to ambient stress at the population level.

It is indeed deplorable that, on a world-wide basis, the main stream of experimental-ecological studies continues to perpetuate insufficiencies in experimental design. Appar-

* Kinne, O., 1980. In: Diseases of marine animals. Ed. by O. Kinne. Wiley, Chichester, 1, 14.

ently we have failed to develop effective mechanisms that can improve and correct the scientific quality of the ever-increasing flood of new research papers. Concern seems also appropriate regarding the often non-critical use of the data available, in the fields of modern ecological system analysis and simulation-model studies. Numerous models may be based on inadequate, if not downright false, data. The potential consequences for ecological concepts and programmes, including those designed to protect nature from critical deformation due to man's activities, could be fatal. We must search for, and define, new standards for ecological research, if we are to meet successfully the severest challenge humanity has ever faced – the challenge to produce and to apply judiciously and responsibly our ecological know-how for protecting nature from critical, irreversible man-made damage and for ensuring that Planet Earth remains habitable for future human generations.

This plea includes explicitly the demand for more ecological studies on the diseases of marine organisms. They are necessary for progress both in basic ecology and in our capabilities for managing man's potentially detrimental effects on nature.

May this International Helgoland Symposium assist in drawing more attention to these vital issues and to the ecological significance of disease phenomena in our seas. And may this meeting be a professionally rewarding as well as a pleasant experience for all of you.

With this plea and in this hope, I hereby open the International Helgoland Symposium 1983 on "Diseases of Marine Organisms".