

**International Symposium**  
**“Man in the sea - in situ studies on life in oceans**  
**and coastal waters”:**  
**Closing address**

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Ladies and gentlemen, colleagues and friends!

The International Helgoland Symposium 1972, “Man in the sea – in situ studies on life in oceans and coastal waters”, has come to its end. The papers have been read and discussed, the Informal Sessions and the social events – including the “Dünen-party” – have become history. The weather god, although with some hesitation, decided to be with us and to provide some sunshine.

Has the Symposium met our expectations? What have we accomplished? It seems to me that this meeting has been useful. We have all had a chance to broaden and to deepen our views and to join stimulating presentations and discussions of new facts and problems. It is too early, however, to attempt a detailed critical assessment of the various scientific and methodological aspects considered. The final judgement on the results and interpretations presented will rest with the reader of the Symposium Volume which we hope to publish within 6 months.

The two Informal Sessions have been convened by Dr. D. C. BEAUMARIAGE and Dr. J. BUNT. The topics of these one-day sessions were: (1) “Manned versus unmanned biological underwater research”; (2) “New methods and apparatus used or proposed for marine biological underwater investigations”. The sessions have been well organized and the participants have expressed satisfaction and appreciation for this opportunity of exchange. While it had been our original intention to publish an abbreviated version of the sessions, conveners and editors have agreed that the primary merits lay in the free, informal and stimulating atmosphere; a written version could hardly do justice to this fact and would not comprise adequate substance to warrant publication.

Considering the essence of the papers and discussions of the Symposium, four major aspects deserve special mention.

(1) Several colleagues have pointed out emphatically that the Symposium is something like a "World-First": the first attempt of active experts to exchange and appraise their experiences and to evaluate the present and future potential of underwater technologies for marine biological research. The interdisciplinary and international character of the meeting has provided both the necessary depth and width.

(2) Over the last few years, man-in-the-sea techniques have achieved swift and substantial progress. The methods of in situ observation and experimentation have become more sophisticated. They begin to approach, and even to equal, man's performance on land.

(3) Intra- and interspecific relationships between the different forms of marine life are more differentiated, more diverse and more complicated than originally assumed. We begin to appreciate how much surface-research vessel studies have confined our attention to quantitative aspects of organismic distributions in space and time, and kept us from penetrating to essential, controlling qualities of co-existence. How can we expect to understand ecological dynamics in oceans and coastal waters without taking into account behaviour? The papers, slides and films on the activity and behaviour of invertebrates and fishes in their unrestrained natural environment have made their point. They document a high level of behavioural diversity and specificity; they indicate that behaviour is an integral determinant of the ecological potential of the species concerned; and they provide convincing evidence that natural behavioural patterns can be studied most adequately by in situ methods.

(4) Underwater observation and experimentation has become a *conditio sine qua non* for modern marine ecology. It is a major tool for studying functions and structures of living systems under in situ conditions. Of primary importance for ecological assessments are rates and efficiencies of performance (metabolism and activity, feeding habits, social interrelationships, reproduction, distribution) as well as dynamic and structural parameters of natural organismic assemblages.

Why go beneath the sea? The motives are manifold, as are the methods and technologies employed. For some it is adventure, for others curiosity and knowledge; still others want to make profit or to increase "national security". In our opinion, a different motivation should override all these reasons for entering the sea: the responsibility of man to keep this earth inhabitable, to maintain a balanced diversity of living forms — the intact ecosystems which have produced man and which are, and will continue to be, the basic and most important prerequisite for his continued existence. Man-in-the-sea programmes will be with us from now on, and they will exert an increasing impact on the destiny of *Homo sapiens*, who has begun to make the sea his temporary home, to occupy the world beneath the sea. This virgin world — gigantic in dimension — is the last great frontier on this globe; and it is man's last great chance! If he fails, if he treats the world beneath the sea the same way he has treated the land above the sea, then there will be no hope, no future. Once the cradle of life, oceans and coastal waters are still the most important life-supporting habitats on earth.

The Symposium has made it possible to renew and to deepen old acquaintances and friendships. And it has provided the base for establishing new human relations. Have we had difficulties to get along with each other? To communicate across the

borders of some 20 countries? No, we have not! This meeting has been a gathering of people profoundly concerned with bringing to light scientific facts about life submerged for millions of years in its ancient saline medium and with helping to find solutions to the many technological and methodological difficulties involved.

Has there been a language barrier? Not really. But our friends from the Soviet Union, from France and from other non-English speaking countries have sometimes been at a slight disadvantage. However, things have improved during the Symposium. Drs. GOLIKOV, SCARLATO and ZHIRMUNSKY kindly agreed to discuss their work in detail during an ad-hoc evening session, and they patiently explained the conceptual fundament of their interesting investigations.

It would not have been possible to organize this Symposium without support and assistance from many sources. I would like to express my sincere gratitude to all participants, especially to the chairmen, the speakers, the two conveners and the contributors to the discussions. Dr. GUNKEL and Herr HOLTSMANN of the Biologische Anstalt Helgoland have assisted me with the local organisation. Together with several other staff members, they have planned and worked busily behind the scenes. I further acknowledge the help of Miss V. CLARK, Fräulein H. WITT and Frau G. WURL; of our administration; the support by the Federal Ministry of Education and Science; and the co-operation from the Helgoland community.

Thanks again to all of you for coming here and for helping to make the International Helgoland Symposium 1972 a success. A good trip home, and come again to Helgoland!