

**THE OCEANS**  
**THEIR PHYSICS, CHEMISTRY,**  
**AND GENERAL BIOLOGY**

FOR METEOROLOGISTS  
OCEANOGRAPHY FOR METEOROLOGISTS, *by* H. U. Sverdrup

# THE OCEANS

## THEIR PHYSICS, CHEMISTRY, AND GENERAL BIOLOGY

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BY

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## Preface

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Four years ago when we started the preparation of this book, we hoped to give a survey of well-established oceanographic knowledge, but it soon became apparent that the book could not be brought up to date without summarizing and synthesizing the wealth of information that has been acquired within the past dozen years, as well as the many new ideas that have been advanced. Consequently, the book has grown far beyond its originally planned scope, and the presentation has become colored by the personal concepts of the authors. Discussion of many topics, such as the absorption of radiation in the sea, the relations of organisms to the chemical composition of sea water, or the productivity of the sea, has led to tentative conclusions that are perhaps presented here as better substantiated than is actually the case. At the risk of premature generalizations we have, however, preferred definite statements to mere enumeration of uncorrelated observations and conflicting interpretations, believing that the treatment selected would be more stimulating.

The book is intended to provide a good deal of factual information, but above all it should be an aid to the beginner and specialist alike in the coordination of the various fields of oceanography. The lists of literature at the ends of chapters are not intended to be exhaustive, but will serve as guides to recent publications. When possible, reference is made to books containing comprehensive bibliographies rather than to original papers.

We are much indebted to our colleagues at the Scripps Institution of Oceanography for their numerous helpful suggestions and their constructive criticism of many parts of the book. We are also obliged to Mr. John A. Fleming, Director of the Department of Terrestrial Magnetism, Carnegie Institution of Washington, for permitting free use of unpublished data from the last cruise of the *Carnegie*.

We extend our thanks to Dr. L. Lek for assistance in carrying out a large number of computations, to Mr. E. C. La Fond for preparation of most of the graphs and charts, to the American Association of Petroleum Geologists and the G. M. Manufacturing Company of New York for use of illustrations published by them, and to the University of Chicago Press for use of the Goode Base Maps. Miss Ruth Ragan has rendered invaluable assistance in correcting and checking manuscript and proofs and in compiling the bibliographies.

*The Authors.*



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