

## BOOK REVIEWS

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**COURS D'OCEANOGRAPHIE PHYSIQUE**  
(Théories de la circulation générale. Houles et vagues)  
**A PHYSICAL OCEANOGRAPHY MANUAL**  
(Theory of general circulation. Swell and waves)

by H. LACOMBE

Ingénieur Hydrographe en Chef de la Marine (C.R.)  
Professor of Physical Oceanography at the Muséum d'Histoire Naturelle

Published by Gauthier-Villars, 55, Quai des Grands-Augustins, Paris (6<sup>e</sup>)  
1965; 27 × 21 cm; 392 pages; 224 figures; price : 90 Francs

“ Professeur LACOMBE's manual is not presented as an encyclopedic work; it is rather a classical work intended primarily for qualified engineers and young people pursuing their studies beyond the graduate stage. The wealth of its content and the clarity and accuracy of its information will, however, render it of great use to anyone coming in contact with oceanography. As an instruction manual it gives the present state of physical oceanography and the many recent developments, some so far known only in the form of articles appearing in countless French and foreign publications. The assembling of this material and its synthesis into a coherent whole has been an enormous task for Professor LACOMBE. Chapter VIII, which is devoted to ocean circulation which is at present the subject of much research work, is in particular of great originality.

This book will, moreover, contribute to making better known several important studies of a theoretical nature recently formulated in France and which have not yet had the benefit of being made widely known. We may cite as examples Mr. Bernard SAINT-GUILY's work on the dynamics of currents, the impressive research of Mr Robert MICHE on the various swell problems, and finally the work of Professor LACOMBE himself on swell refraction and diffraction.”

So writes Mr. A. GOUGENHEIM, Membre de l'Institut, then Director of the French Naval Hydrographic Office, in the Preface to this manual.

There is truly nothing to add to what Mr. GOUGENHEIM has so well described when considering the scope of the book and its technical and scientific standard. We shall content ourselves with giving the chapter headings.

Chapter I. — Introduction. Oceanography.

Chapter II. — Seawater. Principal physical properties.

Chapter III. — Hydrological measurements at sea.

Chapter IV. — Some generalities on currents. Forces acting on the marine environment. Ocean-Atmosphere exchanges. T-S diagrams. Water mass analysis.

Chapter V. — General equations of hydrodynamics. Equation of continuity. Reynolds tensions. Turbulent Exchange. Boundary conditions.

Chapter VI. — Permanent currents in the presence of internal forces only. The dynamical method. Comparison with water mass analysis results. Diffusion and convection. Seas with sills and currents in straits.

Chapter VII. — Ekman's theory. Currents in a homogeneous sea caused by external forces.

Chapter VIII. — Causes of true currents. Recent ocean current theories. Wind-driven and thermohaline circulation. Present difficulties.

Chapter IX. — Swell and Waves. Generalities. Very small amplitude swell. Capillary waves and ripples.

Chapter X. — Finite irrotational swell. Stokes and Levi-Civita swells.

Chapter XI. — Swells in Lagrange coordinates. Gerstner rotational swell. Mische swells.

Chapter XII. — Swell energy budget. Outline of its generation. Principles of monochromatic wave forecasting. Statistical features of sea waves. Their forecasting.

Chapter XIII. — Near-shore wave and swell modifications.

Chapter XIV. — Swell observation and recording.

The book has two indexes; one of authors, organisations and ships; the other of contents and the main geographical names.

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## THE PRINCIPLES OF NAVIGATION

by E. W. ANDERSON

Published by The Bodley Head, 10 Earlham Street, Cambridge Circus,  
London, W.C. 2

1966; 653 pages; 17 tables; 259 figures; 14 × 22 cm; price: 84 s.

“ Yet another navigational treatise ” might exclaim an unobservant navigator, laying aside this book, persuaded that in this field there is little he does not already know.

He would be wrong.

For this remarkable work is not properly speaking a navigational treatise. It does not aim to teach the ABC of navigation to beginners. Nor does it contain an account of unknown navigational methods. In over 500 pages no more than 20 formulas are to be found.

It is solely the product of some reflections on the art of navigating. It amounts to a whole philosophy. As such this work, of which the least we may say is that it is off the beaten track and moreover not a really orthodox treatise, is most timely for it comes at a moment when technical progress and the extension of navigation to the new fields of air and space entail much reflection. Many long-service navigators could read it with advantage, and navigational instructors could profit by it.

The book aims to help the navigator to understand the true nature of his difficulties and the ways in which these difficulties have been tackled in other fields.

In the author's words its object is "to contribute to the exchange of ideas between the navigator and the scientist and engineer in two ways. First, by painting a broad picture of navigation as a whole so that each problem may be seen against a wider background. Secondly, by attempting to suggest a common language appropriate to a study of navigation."

The contents are here listed for they will enable the reader to take the book's purpose in at a glance, and it is to be hoped also inspire an eagerness to read it.

*Introduction.*

*Part One. — The Background.*

Mathematics and errors.  
Environment.  
The craft.

*Part Two. — Instrumentation.*

Control.  
Heading.  
Speed.

*Part Three. — Techniques.*

Course.  
Dead Reckoning.  
The route.

*Part Four. — Basic Aids.*

Position finding.  
General and visual aids.  
Astro-navigation.

*Part Five — Electronic Aids.*

Radio and radio bearings.  
Radio distance measurement.  
Radar and sonar.

*Part Six. — Conclusion.*

Man and the machine.

A bibliography is given at the end of each Part.

The work includes a subject index for the Summaries, an index of contractions and abbreviations, and another for symbols in common use.

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**Developments in Sedimentology**  
**5**  
**THE MOVEMENT OF BEACH SAND**

by James C. INGLE, Jr.

Department of Geology, University of Southern California, Los Angeles

Elsevier Publishing Company Amsterdam, London, New York

Library of Congress catalog card number 65-13238

117 illustrations and 5 tables; 6  $\frac{1}{2}$  ins.  $\times$  9  $\frac{1}{2}$  ins.

printed in the Netherlands, 1966; price : Dfl 40

The recent appearance of radioactive and fluorescent sediment-tracing techniques has opened up a new realm of sediment study. For the first time individual grain paths can be traced and related to dynamic environmental parameters such as current velocity and direction.

This volume presents the results of a large scale investigation of beach sand transport using fluorescent sand. In it the author describes the techniques and results of a two year study of the movement of beach sand, carried out along the southern California coastline.

Sand was released at monthly intervals over a period of a year, in the surf zones of five beaches. The contoured patterns of tracer dispersion which emerge clearly show sand movement in a wide range of oceanographic and geomorphic settings. A large number of patterns are presented and discussed in terms of effect of wave and current parameters and effect of various bottom configurations. Zones of greatest transport are defined for different surf conditions. Movement in the swash zone, seaward of the breaker zone, behind a detached breakwater and around a groin are all shown. Offshore motion of sand in a rip current is strikingly illustrated, and the movement of different size particles traced with sands of contrasting fluorescent hues. Velocity and grain movement are determined and correlated with environmental parameters, such as longshore current velocity breaker height and indices of wave measurement.

Finally, an appendix presents a number of methods for attaching fluorescent dyes to sediment, and an extensive bibliography gives a useful list of American and European papers dealing with sediment tracing.

The book is in seven chapters and has four appendices, a bibliography and an index. Chapter 1 — Introduction; 2 — Field and Laboratory Procedures; 3 — General Patterns of Foreshore-Inshore Tracer Transport; 4 — Sand Movement Seaward of the Breaker Zone; 5 — Sand Movement around Man-made Structures; 6 — Analysis of Tracer Dispersion; 7 — Summary.

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IMPRIMERIE LOUIS-JEAN

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