REVIEWS

Variability of the Oceans. By A. S. Monin, V. M. Kamenkovich and V. G. Kort. English translation edited by J. L. Lumley. Wiley, 1977. 241 pp. £14.95.

Fundamentals of Ocean Dynamics. By V. M. Kamenkovich. English translation by R. Radok. Elsevier, 1977. 262 pp. $49.00 or Dfl. 120.00.

These two translations make a welcome addition to the oceanographic literature accessible to English-language readers. The first book was inspired by Andrei Monin, well known to fluid dynamicists for his work on turbulence, and presents a concise summary of observations and the theory of variability in the deep oceans. It is intended for a broad readership since ocean variability is economically important in such diverse areas as fishing, shipping and long-term weather forecasting. The authors envisage a synoptic service catering for these needs and drawing on the knowledge which is summarized in the book. In 241 pages, the authors succeed extraordinarily well in discussing the whole gamut of length scales, from micro to planetary, and time scales up to those associated with climate changes. Readers of this journal will perhaps most appreciate the sections introducing theoretical ideas. Although the style is 'light', some discussion of the relevant equations and associated mechanisms is included, and references are given for more detailed treatments. Subjects handled in this way include wind waves, internal waves, turbulence, microstructure, tides, inertial oscillations, Rossby waves, synoptic-scale eddies and boundary current meanders. There is a very useful section on numerical modelling of ocean circulation. The only fault in the translated version is that the authorship of the different sections has somehow been omitted owing to a simplified format for the table of contents.

In the second book Kamenkovich adopts quite a different style from the one he uses in the first, as this book is meant for a specialist audience concerned with the application of mathematics to oceanography. It is a scholarly work based on his course for fourth-year students at the Moscow Physical-Technical Institute, and so reflects the depth, care and understanding which one associates with his work. Rather than attempting to cover a broad range of problems, he gives a thorough treatment of three main subjects: thermodynamics of the ocean, linear waves on a sphere using separation of variables, and steady ocean currents (mainly for a homogeneous ocean). The first two topics each occupy about a quarter of the book and the third topic half. The separation technique mentioned is for fixed frequency waves and does not require the hydrostatic assumption. Eigenvalue curves for the separation constant as a function of frequency are found for both the horizontal and the vertical variations; wave solutions correspond to the intersections of these curves. The usual classification into surface, internal, Rossby waves, etc. is readily made. The section on currents begins with a discussion of the equations and includes the author's own contribution on the form that turbulent exchange coefficients must have when vertical processes differ from horizontal processes. Ekman's linear theory of steady currents is treated by Felsenbaum's method of deriving an equation for the stream function rather than the surface elevation. The author's solution of how to deal with the problem of islands is covered, as is his work on effects of topography in a homogeneous ocean. The section on two-dimensional transport models discusses the vorticity balance for a gyre and different types of boundary layer including one where viscous and inertial effects are both important. There is also a small section on thermocline models.

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