RECENT PUBLICATIONS (1979 REPRINT)

Briscoe, M. G. (1975). Internal waves in the ocean: 1975. *Rev. Geophys. Space Phys.* **13**, 591–8.

A good review of the subject, with a comprehensive bibliography of recent work.

Farmer, D. M. (1975). Penetrative convection in the absence of mean shear. *Quart. J. Roy. Met. Soc.* **101**, 869–91.

A clearcut series of observations on convective deepening in an ice-covered lake, where there can be no mechanical energy inputs (§§7.3.4, 9.2.3).

Fedorov, K. N. (1976). *The thermohaline finestructure of the ocean.* Leningrad: Gidrometeiozdat.

Gives a good summary of recent ocean observations, especially of layering associated with two-dimensional double-diffusive processes (§8.2.3). In the English translation (Pergamon 1978) extra references (to mid-1977) have been added.

Fischer, H. B. (1976). Mixing and dispersion in estuaries. *Ann. Rev. Fluid. Mech.* **8**, 107–33.

An excellent review of a wide range of processes, including the effects of stratification and lateral mixing (§5.3.4).

Gargett, A. E. (1978). Microstructure and finestructure in an upper ocean frontal regime. *J. Geophys. Res.* **83**, 5123–34.

Documents the importance of double-diffusive processes near oceanic fronts. Two-dimensional effects must be considered, as well as the one-dimensional processes described in §8.2.4.

Garrett, C. J. R. and Munk, W. (1975). Space-time scales of internal waves: a progress report. *J. Geophys. Res.* **80**, 291–7.

The authors have proposed a universal wave number-frequency spectrum, based on observations, which has had a great influence on work in this field.

Gregg, M. C. (1975). Microstructure and intrusions in the California Current. *J. Phys. Oceanogr.* **5**, 253–78.

Shows that the regions of most intense activity are the upper and lower boundaries of intrusions produced by interleaving (§8.2,3).

Hopfinger, E. J. and Toly, J-A. (1976). Spatially decaying turbulence and its relation to mixing across density interfaces. *J. Fluid Mech.* **78**, 155–75.

Substantial confirmation of the results described in §9.1, derived from larger-scale laboratory experiments.

Huppert, H. E. and Moore, D. A. (1976). Nonlinear double-diffusive convection. *J. Fluid Mech.* **78**, 821–54.

A numerical study of large-amplitude motions (§8.1.4) with wider implications for other convection problems. The minimum value of *Ra* for which time-independent motions can occur can be less than the minimum critical value predicted by linear theory.

Huppert, H. E. and Turner, J. S. (1978). On melting icebergs. *Nature* **271**, 46–8.

The two-dimensional system of layers produced by cooling and melting at a vertical ice surface in a stratified fluid (§8.2.3) is shown to have important oceanographic implications.

Imberger, J., Thompson, R. and Fandry, C. (1976). Selective withdrawal from a finite rectangular tank. *J. Fluid Mech.* **78**, 489–512.

A unified treatment of the various flow regimes described in §3.3. It also deals with the related intrusion problems.

Joyce, T. M., Zenk, W. and Toole, J. M. (1978). The anatomy of the Antarctic polar front zone in the Drake Passage. *J. Geophys. Res.* **83**, 6093–113.

Includes observations of interleaving structures which are interpreted in terms of double-diffusive processes (§8.2.3).

Katsaros, K. B., Liu, W. T., Businger, J. A. and Tillman, J. E. (1977). Heat transport and thermal structure in the interfacial boundary layer measured in an open tank of water in turbulent free convection. *J. Fluid Mech.* **83**, 311–35.

Gives an excellent summary of the background, as well as experimental results at high *Ra* which support the $Nu \propto Ra^{1/3}$ relation (pp. 213, 220).

Kotsovinos, N. E. and List, E. J. (1977). Plane turbulent buoyant jets. Part I. Integral properties. *J. Fluid Mech.* **81**, 25–44.

This paper (and Part II on the turbulence structure) gives a substantially improved description of the entrainment process (§6.1.4).

Kraus, E. B. (Ed.) (1977). *Modelling and prediction of the upper layers of the ocean.* Pergamon, Oxford.

The proceedings of a conference at which the leading workers in the field surveyed various aspects of the problems discussed in §9.2.

Launder, B. E. (1976). Heat and mass transport. In: *Turbulence*, ed. P. Bradshaw, pp. 231–87. Berlin: Springer-Verlag.

Summarizes methods of calculating turbulent structure and fluxes, based on closure schemes which are developments of those described in §5.2.3. Other articles in the volume are also relevant.

Lighthill, Sir James (1978). *Waves in fluids.* Cambridge University Press.

An authoritative monograph covering all types of wave motion, including linear and non-linear internal waves. There is a helpful annotated bibliography.

Maxworthy, T. and Browand, F. K. (1975). Experiments in rotating and stratified flows: oceanographic application. *Ann. Rev. Fluid Mech.* **7**, 273–305.

Reviews in particular experimental methods, intrusions (§3.3), and instabilities due to internal waves (§§4.1.4, 10.3).

McEwan, A. D. and Robinson, R. M. (1975). Parametric instability of internal gravity waves. *J. Fluid Mech.* **67**, 667–87.

The previously puzzling instabilities described on p. 328 and shown in fig. 10.5 have now been explained in terms of another resonance mechanism.

Niiler, P. P. (1977). One-dimensional models of the seasonal thermocline. In: *The Sea* Volume 6, ed. E. D. Goldberg *et al.*, pp. 97–115. London, New York: Wiley Interscience.

A good summary of the various approaches to this problem (§9.2) developed over the past ten years.

Plate, E. J. (ed.) (1979). *Engineering meteorology*. Amsterdam: Elsevier.

This multi-author volume ranges widely over topics related to most chapters in this book.

Pollard, R. T. (1977). Observations and theories of Langmuir circulations and their role in near surface mixing. In: *A Voyage of Discovery*, ed. M. Angel, pp. 235–51. Oxford: Pergamon.

A good summary of the development of this field, and of the currently preferred theoretical explanation in terms of wave-current interactions (p. 300). Other articles in the volume are also of interest.

Sherman, F. S., Imberger, J. and Corcos, G. M. (1978). Turbulence and mixing in stably stratified waters. *Ann. Rev. Fluid Mech.* **10**, 267–88.

Up-to-date review of double-diffusive convection, especially recent theories (§8.1); mixing driven by shear or waves (§§4.1.3, 10.3) and mixing due to external energy inputs (§§4.3.1, 9.1).

Stern, M. E. (1975). *Ocean circulation physics*. New York, London: Academic Press.

A more theoretical discussion of various subjects treated in this book. In particular the chapter on 'Thermohaline convection' complements our chapter 8.

Thorpe, S. A. (1973). Turbulence in stably stratified fluids: a review of laboratory experiments. *Boundary Layer Meteorology* **5**, 95–119.

A useful discussion of the experimental work in this field.

Thorpe, S. A. (1978). On internal gravity waves in an accelerating shear flow. *J. Fluid Mech.* **88**, 623–39.

Numerical and laboratory experiments on the interaction between a mean flow and a train of internal gravity waves. The early experiments in this elegant series are described in §4.1.4 and in the above review.

Tritton, D. J. (1977). *Physical Fluid Dynamics*. New York: Van Nostrand Reinhold.

An excellent textbook which discusses a wide range of fluid phenomena from a physical viewpoint.

Turner, J. S. (1974). Double-diffusive phenomena. *Ann. Rev. Fluid Mech.* **6**, 37–56.

A review of theory, experiments and applications which extends the subject matter of chapter 8.

Turner, J. S. (1978). Double-diffusive intrusions into a density gradient. *J. Geophys. Res.* **83**, 2887–901.

Laboratory experiments which demonstrate the importance of double-diffusive processes in driving intrusive motions when there are strong horizontal property gradients.

Williams, A. J. (1975). Images of ocean microstructure. *Deep-Sea Res.* **22**, 811–29.

The first direct observations of salt fingers in the ocean, using an optical technique. They thus fill the gap mentioned on p. 272.