J. Fluid Mech. (1994), *vol.* 261, *p.* 375
Copyright © 1994 Cambridge University Press

REVIEW

Fluid Mechanics of the Atmosphere. By R. A. BROWN. Academic Press, 1991. 486 pp. $69.95.

The title of this book suggests that it aims to be an introduction to basic fluid mechanics with an application to atmospheric flow phenomena. This is indeed the goal that the author mentions himself in several places throughout the text. However, when one starts to read, one becomes quickly aware of the fact that its purpose is primarily restricted to be an introduction to basic concepts in fluid mechanics. Typical subjects that are treated are: the kinematics of flow fields, the equations of conservation of mass, momentum and energy, dimensional analysis, potential flow and vorticity: topics that can be found in any elementary text on fluid mechanics. The added value of this book would consist of the application of these standard concepts to atmospheric flow phenomena. However, here it seems to fail. For instance, the principal ingredients of almost all atmospheric flows are both rotation and stratification. Rotation is indeed mentioned in the book, but its effect on flow dynamics is hardly treated in a systematic way. Stratification is completely ignored. The only topic in atmospheric fluid dynamics that is discussed in some detail is the Ekman boundary layer.

It should be mentioned in favour of this book that the author invests much effort and attention in the presentation of several approaches towards the derivation of the basic equations of fluid dynamics. In his own words, the goal is to achieve an understanding of these fundamental equations. However, the further development of these equations in terms of solutions of real flow problems is limited, and mainly restricted to examples scattered throughout the text.

The book is meant to be a textbook for a fluid mechanics course to be offered to first-year graduate students in atmospheric science. Although not explicitly mentioned, it seems that the point of departure is that no knowledge of fluid mechanics is presupposed and only a basic knowledge of mathematical analysis. To aid students in mastering the contents of the book several exercises are offered at the end of each chapter. Some of these problems use American units whereas in most of the book the metric system is applied. There is no comprehensive list of all the symbols introduced in the text.

In conclusion, this book is to be classified as a textbook in classical fluid mechanics. As such, it should compete with the other texts on this topic presently available on the market and in this category it does not rank first, at least in the opinion of this reviewer.

F. T. M. NIEUWSTADT