

## BOOK REVIEW

*The Australian Climatic Environment* by E. Linacre and J. Hobbs (John Wiley and Sons: Brisbane, 1978) \$A15.50, x + 354 pages, 201 figs, 99 tables, 648 tests and exercises.

The intending reader expecting this to be a book about the Australian climatic environment may be disappointed. One cannot help feeling that the authors must have been torn between a commendable urge to produce a 1970s version of Hunt, Taylor and Quayles' 1913 classic *The Climate and Weather of Australia* (which, remarkably, they do not reference) and the more practicable objective of an introductory text on meteorology and climatology. What they achieve is more of the latter and less of the former, but the achievement is well worthwhile. This is the first reasonably comprehensive and authoritative text in its field written for the Australian scene. Certainly the overall level of treatment is elementary, but a lot of material is packed into the 350-odd pages and the book should, as intended, prove useful to school teachers, to tertiary students beginning geography or meteorology courses, and to the intelligent layman. Nor should the professional climatologist or meteorologist feel embarrassed to own a copy, even though it's not quite what the title might suggest.

The book has 31 chapters grouped into seven parts dealing in turn with energy flows in the atmosphere (Chapters 1-5), the cycle of water movement (Chapters 6-11), winds and weather (Chapters 12-16), climates (Chapters 17-20), applied climatology (Chapters 21-24), additional information (Chapters 25-27), and tests (Chapters 28-31). The text proper finishes at the end of Part V (Chapter 24), Part VI being in the way of a compilation of useful numerical and other ancillary data, a section-by-section list of suggested sources for further reading on the topics of Chapters 1-24 and a good 25-page bibliography. Part VII underscores the central teaching/learning thrust of the book: the four chapters take the material of Chapters 1-24 and present, section-by-section, a set of self-assessment tests, numerical exercises, essay questions, and answers. The last fourteen pages of the book are taken up with what the authors describe as an 'unusual' index in which the entries refer the reader to chapter and section rather than to page numbers. While the scope and arrangement of entries in the index seem about right, opinions will differ on the unusual presentation. Some may like it.

Each to his own preference in developing a pattern of presentation of basic meteorology to students but the selection of topics and their order of presentation in the 'meteorology' chapters (Parts I-III) will puzzle some readers. A chapter (7) on atmospheric stability and instability appears a little out of place in Part II (The Cycle of Water Movement) and might well have been interchanged with the chapter (4) on evaporation with some net gain to the overall flow of the book. It is mildly disconcerting to find the definitive treatment of tornadoes (Section 7.5) before one gets to a chapter (8) on clouds and to meet up with the always-troublesome Coriolis effect for the first time in the discussion of the oceans (Chapter 11) a full dozen pages before getting down to basics like the forces controlling the winds (Chapter 13). It may be that the continuity and readability of the first half of the book would be better had the authors not felt constrained to tie the chapter order in so closely with the themes of energy flows, water, and winds. The organisation of the remainder of the book is good, though the chapters on applied climatology could be seen as a somewhat random selection of topics that were evidently of interest to the authors rather than a systematic, if introductory, treatment of the field.

It is both a strength and a weakness of this book that it tries to be all things to all readers. The strength lies in the breadth of appraisal and the sheer convenience of having so much useful material between two covers. The weakness stems from the greater susceptibility to oversight, imbalance, and error. Thus one might express surprise at a number of apparent omissions from the text: it is hard to argue, for example, that the hydrostatic approximation does not warrant mention in even the briefest basic treatment of meteorology. But it is not there. Similarly, we find a whole section of Chapter 1 on atmospheric electricity without a mention of either thunderstorms or lightning. There are also some errors, though these are neither numerous nor serious. The meteorologist reader may, however, find it hard to excuse some of the liberties taken - particularly in Part III (Winds and Weather) - with meteorological definitions and concepts. Thus for a definition of hail we find (Section 9.3) 'large ice crystals formed within a cold cloud near the ground have insufficient time to melt and reach the ground as hail'. Regions of zero convergence or divergence are described as 'barotropic' (Section 13.2) and later on (Section 14.4) we find the suggestion of a 'better classification' system for cyclones depending on temperature and pressure patterns such that 'barotropic' cyclones include tropical cyclones and also those due to convergence on pools of cold air in the middle and upper troposphere. Tropical cyclones may be many things but they are certainly not barotropic!

Despite a smattering of minor inaccuracies (e.g. in statements about the Australian observing network, meteorological codes, the duration of the northern Australia 'wet') and blemishes (missing location numbers on the map inside the front cover, reference (p. 183) to the Dandenong Ranges as 30 km west of Melbourne, missing units on a few figures, and a sprinkling of typographical errors (e.g. pp. 45, 100)) the overall presentation of the book is excellent. Mishaps such as the obvious misalignment of the book's only satellite photograph (Fig 8.8) can easily be fixed by hand. The consistent use of SI units in the text is pleasing but it is a pity that the non-metric figures were not redrawn.

Anyone planning to use *The Australian Climatic Environment* as a course text or reference or even as a basis for preparing an introductory course on meteorology will be interested in the material of Part VII. The self assessment tests and numerical exercises (by Linacre and Ann McGrath) are an important part of the book and represent a valuable contribution to the available teaching aids for introductory meteorology and climatology in Australia. One might quibble with some of the answers given for the self assessment tests and exercises but a random sample showed up none that were clearly wrong.

In summary, *The Australian Climatic Environment* impresses as a good elementary text on meteorology and climatology. It is the first of its class so far written specifically for use by Australian students and it should be well received. Hopefully it will play a significant part in developing the understanding of the complexities and the fascinations as well as of the practical significance of meteorology and climatology to Australia over the next generation.

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