

properly monitored banding programmes of colonial species in Antarctica and elsewhere. (Bernard Stonehouse, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER.)

THE CLIMATES OF ANTARCTICA

WEATHER AND CLIMATE OF THE ANTARCTIC. Schwerdtfeger, W. 1984. Amsterdam, Elsevier. (Developments in Atmospheric Science: 15). 262p, illustrated, hard cover. ISBN 0-444-42293-5. US \$46.25. Dfl. 120.00.

According to the author, the purpose of *Weather and climate of the Antarctic* is to present an up-to-date description, and as far as possible explanation, of the meteorological characteristics of the southern continent, including its inseparable topics weather and climate and their close relation to ice conditions on the surrounding waters. Some problems which need further field work and theoretical investigation are outlined in detail. However, questions of weather forecasting are discussed only where it appears that new information or understanding of the involved atmospheric processes make it worthwhile. Schwerdtfeger considers that in the past two decades, considerable progress has been made in meteorological, climatological and related glaciological research in Antarctica and the surrounding ocean. A large part of the resulting literature refers directly or in a broad sense to climate problems. In contrast, little has been published about the vagaries of *weather* in different sectors of the continental coasts, and on the formidable high plateau which, permanently covered with snow and ice, is yet one of the largest deserts on earth. This is the gap in the literature filled by Schwerdtfeger's book, which is a detailed, comprehensive study of antarctic meteorology.

Chapter 1 is introductory, considering Antarctica's unique topography (over 97 per cent permanently covered with snow or ice, mean surface elevation over 2 300 m) and the effects of polar day and night, and drawing attention to the sparseness of meteorological stations. The USA has roughly fifty times more year-round stations per unit area than the antarctic region; lack of stations (most of which have operated only since the International Geophysical Year, 1957-58) has recently been compensated in part by measurements from satellite, automatic weather stations, drifting buoys and GHOST balloons. Chapter 2 discusses radiation and temperature, treating radiation balance in detail with examples from many stations, and such temperature phenomena as the 'pointed summer' and 'coreless winter' of the high plateau and temperature inversion in the lower troposphere. Chapter 3 discusses surface winds including inversion, katabatic, barrier and foehn winds, and also blowing snow and windchill. Atmospheric circulation and its disturbances are described in Chapter 4, including such topics as the circumpolar vortex, cyclones and anticyclones over the southern ocean, and atmospheric pressure systems over the antarctic plateau.

Chapter 5 describes water as gas, liquid, and solid, covering its transport, clouds and fogs, precipitation and accumulation. In Chapter 6 the author considers selected problems of Antarctic climatology, including the ice mass budget, ice supply and climate, and periodic fluctuations of temperature and pressure, with a brief comparison of south and north polar climates. Ice mass budget is one of Antarctica's major unsolved problems awaiting further research. Early research surprisingly reported a positive mass budget, indicating that the snow and ice cover has recently been growing. Later research suggests that individual budget components are too inaccurate to allow certainty over the sign of the budget as a whole. Satellite technology should soon help to increase accuracy, for example in monitoring calving from glaciers and ice shelves, a component large and

important enough on its own to affect the sign of the budget. The related problem of antarctic temperature fluctuations is discussed at the end of Chapter 6. Mean annual temperatures at Orcadas, the only meteorological station south of 60° S with a long record of observations, fell between 1908–30, rose between 1931–56, then again fell slightly to 1981. As Schwerdtfeger comments, such variations do not support the popular hypothesis that increasing carbon dioxide in the atmosphere is leading to warming, though his data on the mean temperatures of early and recent decades show some indications of slight warming.

The list of references at the end is extensive, and about 50 per cent of journal articles quoted are less than ten years old. Tabulated data are also extensive and will form a valuable reference source for future workers. Nevertheless, the work is much more than just a collection of climatological statistics, because it gives a very good picture of the weather in the Antarctic. In particular the great difficulties in collecting meteorological data are made very clear. Examples and anecdotes throughout the text make this a most readable book and a mine of information. Professor Schwerdtfeger is to be congratulated on producing such a useful and important collection of information. He has succeeded admirably in his aim, and his book should be in every library of Antarctic literature. (J. G. Lockwood, School of Geography, University of Leeds, Leeds LS2 9JT.)

LOCAL GOVERNMENT IN ALASKA

ALASKA'S URBAN AND RURAL GOVERNMENTS. Morehouse, T. A., McBeath G. A. and Leask, L. 1984. Lanham, University Press of America. 261p, illustrated, soft cover. ISBN 0 8191 3771-5. \$11.25.

If one is interested in local government and its application to Arctic and sub-Arctic territory, one might expect Alaska to provide the most instructive and sophisticated example. A new state, created in 1959, could surely experiment with new forms of government devised to fit the unusual situation. One's expectation would be justified, and this excellent book by three University of Alaska researchers lays it all out with exemplary clarity. They emphasise the features of the system which are specially Alaskan (rather than make a comparison with the rest of the USA), and this suits the non-American reader too. The biggest unit of Alaskan local government is the borough (pronounced burrow), which would be called county in most other parts of the United States, and there is an interesting concept of the 'unorganised borough' for the very large areas not incorporated. Special attention is given to the remarkable North Slope Borough, 88 000 square miles along the Arctic coast, where revenues from the Prudhoe Bay oilfield allowed a borough budget in 1983 of \$185 million to service the 4 500 inhabitants, principally Eskimo. This is the sort of local government it must be exciting to operate—but what if, or rather: when, the oil runs out? As it is, they calculate in Alaska that a drop of \$1 a barrel in world oil prices costs Alaska \$150 million in tax revenue. The book is full of useful and relevant information, derived not only from published sources (which are very numerous), but from interviews with many of the people concerned. Can any of the ideas be applied elsewhere? Probably, but it would clearly help if elsewhere contained a major oilfield. (Terence Armstrong, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER.)