esses at work in interstellar chemistry. There is no indication of how complex the undiscovered interstellar molecules may be. Even so it is unlikely that DNA will ever be discovered in interstellar space.

One field of study scarcely touched upon in this volume is the use of molecular observations as probes of the interstellar medium. They have proved particularly significant in studies of dense gas clouds such as those found in the general interstellar medium, in the immediate vicinity of certain recent formed stars and in the galactic centre region.

In summary, this book provides a number of excellent review articles—especially those of Field, Iben, Litvak and Ponnamperuma, and a medley of research reports. It will be read with interest by astronomers and biologists.

R. D. Davies

Strong probability

Stochastic Analysis: A Tribute to the Memory of Rollo Davidson. Edited by D. G. Kendall and E. F. Harding. (Wiley Series in Probability and Mathematical Statistics.) Pp. xiii+463. (Wiley: London and New York, August 1973.) £11.

Names of branches of science are often coined to express an insight into their nature, and 'stochastic analysis' is one of these. It witnesses to the end of the isolation of probability theory, to its penetration into, and its complementary illumination by, many different areas of pure and applied mathematics. Today one finds probabilistic methods cropping up in the most surprising places, just as probability theory itself now calls on mathematical tools of every variety.

Twelve years ago the University of Cambridge established a chair of mathematical statistics, and shortly afterwards moved its Statistical Laboratory from the basement of the chemical laboratories to a disused paper warehouse. In such unpromising surroundings there grew up the leading centre in Britain for research in stochastic analysis, attracting visitors from all over the world. This volume, which is to be joined by a companion on stochastic geometry, gives a good feeling for the exciting work that has gone on there. It originated in the idea of a memorial to Rollo Davidson, a brilliant mathematician whose tragic death in a mountaineering accident at the age of twenty-five deprived the subject of one of its most promising workers, and his friends of a delightful companion. Among the articles printed is posthumous work of Davidson, reconstructed from the papers which he left.

Although in one sense the book is historical, it is not backward-looking; the lines of research described are still very active, and there are many unsolved problems which pose a challenge for the future. Nor, despite the fact that a dozen authors have contributed, does the book exhibit the miscellaneous character common in such collections; the influence of the warehouse, and of its director, runs as a unifying thread through the various papers. To Professor Kendall, and to his colleague Dr Harding, one owes a debt of gratitude for producing a book which will be of great interest not only to the specialist, but to the mathematician or statistician who wants to know what is going on in this field.

J. F. C. Kingman

Atmosphere and climate

Synoptic Climatology. By R. G. Barry and A. H. Perry. Pp. xvi+555. (Methuen: London, October 1973.) £9.50.

Many readers will have only a hazy idea of what is meant by synoptic climatology; indeed different authors have different ideas on the subject but in this volume the basic aim is to relate local or regional climates to a meaningful frame of reference—the atmospheric circulation. The authors recognise two stages in any synoptic climatological study, the determination of categories of atmospheric circulation type and the assessment of weather elements in relation to these types. Such studies cover a very broad field including long range weather forecasting on time scales from a week or so ahead to a decade or more.

The book is sensibly laid out with main sections covering history, data and analysis, synoptic climatological analysis, statistics, applications and future prospects. One of the best features is the bibliography of some eighty pages which covers much of the useful foreign literature as well as most of the modern work of the British Meteorological Office and includes works published up to 1973. I could detect no errors in the bibliography.

The volume is intended for students of advanced climatology at senior undergraduate or graduate level and for students of environmental problems. The authors have not, however, differentiated between the wheat and the chaff; they refer to important and unimportant aspects of the subject without a clear indication of which are the most essential. In chapter 2, for example, there is a good deal of obsolescent information dating from before 1950 about the frequency of cyclones and anticyclones and the tracks of depressions and only a few pages are devoted to discussion of the value of satellite pictures in synoptic climatological analysis.

Chapter 3 gives on the other hand a very good account of the various classification systems which have been devised to describe day to day weather on both regional and hemispheric scales. Not only are the more well known classifications such as those of Lamb and the German Grosswetterlagen fully discussed but the various Russian methods are explained in a lucid manner which is not easy to do from translations of the originals which I have studied. Lesser known classification systems, such as those based on both surface and upper air conditions, for Italy by Gazzalo and for Switzerland by Schuepp, are welcome inclusions.

The chapter on statistical methods is rather patchy; the more elementary side is adequately covered but the chapter tries to cover too much ground which would be better dealt with in a suitable text book.

Since synoptic climatology is essentially a practical subject the devotion of 150 pages to applications is very reasonable; in fact this chapter could easily have been made longer. The best use has not, however, been made of the available space: there is far too much discussion about "singularities" and methods of defining natural seasons (curiously without reference to the Russian six-season system) and very little on important applications such as animal diseases, (only one reference to the extensive work of L. P. Smith) and human biometeorology.

The section on long-range forecasting gives some indication of the complex methods presently used, but does not give any clear idea of the relative importance of the different ideas. There is a fairly good section outlining the possibilities of climatic forecasting on the time scale of decades or longer and there is good appreciation of the importance of sea temperature anomalies in determining the various atmospheric modes.

The final chapter, though short, is an adequate summing up and indicates that there is a promising future for the subject in many fields. The book should certainly go a long way towards meeting university teaching needs and will be read with interest by many meteorologists. It is a pity that some of the figures are not clear, due usually to coastlines not being adequately distinguished from other lines but occasionally also to inadequate explanation; there are also a few typescript errors. Nevertheless the book is a welcome addition to the scientific literature.

R. A. S. Ratcliffe

Erratum

In the review of the book *Immunopotentiation* (Ciba Foundation Symposium 18) (**242**, 322; 1974), the third paragraph should have started: "It seems likely that the agents useful in cancer act on the immune system" instead of "It seems unlikely . . ." as printed.