

succinctly. On the other hand, the treatment of water movement in plants is somewhat skimmed and includes virtually no discussion of transport in the xylem. I was particularly disappointed to find no reference to the extraordinary ability of the giant Redwood trees to raise water.

The author in his preface refers to the dilemma which faced him in deciding upon the place of mathematical theory in his book, a dilemma which he resolved by introducing a short "practical preamble" at the beginning of his chapter entitled "Phenomenological Description of the Transport Process", and then following this with a fairly lengthy excursion into irreversible thermodynamics. For the *cognoscente* this excursion is probably unnecessary; the presentation is too compressed to be really helpful to the novice and does not bring out at all clearly the thinking behind the development of irreversible thermodynamics from its more familiar progenitor, equilibrium thermodynamics, sometimes dubbed "thermostatics". These are contrasted in terms of entropy changes rather than of the notion of moving from states to rates. But the mathematics used is relatively straightforward and furthermore, the succeeding parts of the book can be read profitably without any particular mathematical expertise.

Dr House's approach to his subject is commendably judicial and the evidence for and against the ideas which he discusses is carefully evaluated and, where appropriate, he has interposed a 'summing up'. Occasionally he abandons his detachment and confesses, with engaging candour, to personal bias. For example, this bias is freely admitted following a spirited and critical examination of the widely accepted dogma that active transport of water is inadmissible on energetic grounds. A plausible, if slightly confusing case, based as it is on a mixture of reversible and irreversible thermodynamics, is put forward for bringing in a verdict of "not proven" on this highly controversial issue.

This monograph forms a worthy addition to the series published for the Physiological Society. To predict that it will successfully stand comparison with some of the best of its predecessors implies both an established criterion for judgement and at the same time a deserved compliment to Dr House.

R. V. COXON

Warm blooded

Temperature Regulation in Mammals and other Vertebrates. By John Bligh. Pp. xix+436. (North-Holland: Amsterdam and London; American Elsevier, New York, 1973.) \$30.20.

DR BLIGH is to be congratulated on writing a book which is stimulating and concise, covering the whole field of thermoregulation in vertebrates—an area in which he himself is a distinguished worker. The book is written from the physiological standpoint and it will prove unsatisfying to physiological ecologists, since, for instance, many of the adaptations shown by mammals living in unusual environments are mentioned only briefly or not at all. It includes chapters on the traditional areas of thermoregulation (central control, sensing systems, effector mechanisms, neuronal influences, central transmitter substances and so on).

There are very stimulating chapters on the various models of the thermoregulation system which have been proposed, and there are useful sections on unorthodox theories, fever and exercise. In the section on comparative thermoregulation there seems to be no mention of the recent work on thermoregulation in certain large fish. This, however, does not take away from the overall high standard of the book which is highly recommended. It is a well produced book but perhaps rather expensive.

J. N. R. GRAINGER

Scientific literature

Understanding Scientific Literature: a Bibliometric Approach. By Joseph C. Donohue. Pp. xiii+101. (MIT: Cambridge, Mass. and London, 1973.) \$10.

TWENTY years ago, the American librarian Jesse Shera was advocating the study of a 'social epistemology' defined as "the analysis of the production, distribution and utilisation of intellectual products in much the same fashion as that in which the production, distribution and utilisation of material products have long been investigated". He pointed out that all the requisite data are to be found in the books and journals that fill the shelves of our libraries. By analogy with econometrics the term bibliometrics was later coined to cover the essentially data-collecting and analytical phase of a more theoretical study, which would be concerned with the organisation of mankind's exosomatic stores of knowledge for more effective social use.

In an uncoordinated way the statistical analyses Shera called for have been developed in recent years and the slim volume under review is the first monograph wholly devoted to these matters. One would expect the author of such a work to offer a critical review and constructive coordination of the widely scattered contributions and thus present the first consolidation of the emergent study. The need for such a work is now more urgent than it was twenty years ago because during that time large-scale computerised documentary information systems have been developed and the feasibility of even larger world systems is now being discussed. But all systems so far designed have been based on the very questionable assumptions that all published scientific papers have equal scientific weight, that 100% coverage is a desirable goal and that all papers retain their scientific interest *sine die*. These systems can only become more effective, more frequently used and less costly when their designers pay attention to the use made of scientific information by its scientific users—a use which is fully documented within the scientific journals themselves.

There are several techniques which bear on these matters and which one would expect to find described in a 10-dollar monograph. Two empirical laws have been known for some time. In 1925, Lotka noted that the number of authors who contribute r papers to any specified subject literature over any specified period is proportional to $1/r^2$ (though the exponent is 1.89 rather than 2). And in 1934, Bradford noted that, when bibliographical sources are ranked in order of decreasing productivity, the number of items contributed

LOW TEMPERATURE LABORATORY TECHNIQUES

A. C. ROSE-INNES

In the last ten years, since the publication of *Low Temperature Techniques*, there have been considerable advances in this field. So much so that in bringing the material up to date a new book emerged with the more suitable title of *Low Temperature Laboratory Techniques*. The book has been divided into two parts. Part 1 deals with the use of liquid helium⁴ to obtain temperatures down to about 1K and describes the techniques and apparatus which can be used. Part 2 deals with the use of liquid helium³ to obtain temperatures below 1K and will be most useful to engineers and scientists who use very low temperatures in their research. £3.95 net 0 340 17143 X

Available through all good bookshops

For further information please write to:



THE ENGLISH UNIVERSITIES PRESS

Dept P868 St. Paul's House
Warwick Lane, London, EC4P 4AH