

Rotifera and Crustacea, while the non-photosynthetic in contrast to the photosynthetic Protists are shown to be of relatively less importance. The biology of these groups has been considered in its widest sense from life histories, ecology, seasonal succession, to vertical distribution. A mass of diffuse data is summarized, including valuable work on algae as food, a relatively neglected link in the productivity of lakes. This is followed by two rather special topics, vertical and horizontal distribution (especially of Cladocera) and cyclomorphosis. The latter is mainly concerned with rotifers (*Asplanchna*, *Keratella*) and Cladocera (*Daphnia*, *Bosmina*), but also deals with dinoflagellates (*Ceratium*) and, although a little out of place, the size changes in diatoms. As in the first volume, there is finally a list of symbols used in the book, an excellent bibliography and index, index of lakes (including latitude and longitude for most), index of organisms, and finally a general index. Summaries are provided at the end of each chapter and an elementary student may gain a considerable insight into limnology from these alone but would miss a wealth of thought-provoking material.

The production uses the same type and format as the first volume, but there are in this case rather more common mis-spellings, particularly in the captions to the figures, which are themselves excellently produced.

No review can hope to indicate the extensive coverage of literature and ideas, of scholarship and of effort which has gone into this volume. It is an expensive book and it is devoted partly to plants and partly to animals. I trust no serious student of limnology will be put off by either: to search the literature would be even more expensive of time, effort and money, and biological limnology is essentially a synthesis of both or rather all four kingdoms which, under water, assume equal importance; at least awareness of all is essential to good limnology.

F. E. ROUND

RICE UP TO DATE

Mechanization and the World's Rice

(Proceedings of a Conference to Support the International Rice Year 1966 of the FAO of the UN held Sept. 26–Oct. 1, 1966.) Pp. 163. (Warwickshire: Massey-Ferguson (Export), Ltd., 1967. Distributed throughout the world by Basil Blackwell, Oxford.) 63s.

RICE is the staple food of more than half the population of the world and most of it is still grown as a subsistence crop on very small holdings. There is urgent need to increase supplies, and in order to focus attention on the problems involved the Food and Agriculture Organization of the United Nations (FAO) made 1966 an International Rice Year within the Freedom from Hunger Campaign.

Available supplies may be increased by extending the area of rice grown, by increasing the yield of each acre, and by decreasing losses during subsequent storage and processing. Mechanization can help to achieve these objectives, and the conference held in 1966 discussed how best to introduce machinery; the types at present available were demonstrated.

The twenty-five papers describe various aspects of production, storage and processing; some speakers deal specifically with mechanization, others do not mention it at all. All contributors treated the subject generally and sometimes superficially. The presentation and technical content are likely to prove more valuable to those engaged in planning and administration than to the specialist.

The book is printed by direct reproduction of type-script in double columns without the type being justified and so presents an uneven appearance. The diagrams are all clear, and the several photographs of rice production and rice machinery improve the presentation. The report

is printed on good quality paper and is therefore pleasant to handle, although the paper-back binding appears somewhat flimsy.

I have no doubts that the conference was very valuable, but I doubt the value for money of the report.

J. K. R. GASSER

REFERENCE TO LUMINESCENCE

Luminescence of Inorganic Solids

By Paul Goldberg. Pp. xii + 765. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1966.) 236s.

THIS book represents an attempt to survey inorganic luminescence in terms of a general introduction and eleven chapters on specific themes contributed by separate authors. Experience will have made readers painfully aware of the drawbacks of this treatment, but this volume indicates that a judicious editor can build up, instead of a chaos of fragmentation and repetition, a well-composed picture of the topic by prudent choice of authors and careful correlation of their contributions. In fact, Dr Goldberg has done much to free the field of luminescence from the siege mentality engendered in a topic which, in relation to theory, developed before its time, and which has often been stultified by an intractable technology.

The core of the book consists of articles on luminescence in halide, diamond and ZnS lattices, that is, those areas in which luminescence is in useful contact with other active areas of solid state physics. Oxygen-dominated phosphors are treated separately, and other sections deal with the materials problems of the development of lasers, and the luminescence of glasses and of thin films, providing some good surveys of the newer technical extensions of luminescence. There are two chapters on electroluminescence, one dealing with $p-n$ junctions and the other with the less certain field of zinc sulphide. The use of electron spin resonance to study luminescence centres is admirably surveyed, and in the final chapter the different aspects of particle-excited luminescence, separated by historical accident, are unified.

The index in a book of this type is of great importance, but this one is, unfortunately, rather inadequate—for example, there is no cross-reference from “Optical Maser” to “Laser”. None the less, the book should serve well as both reference book and textbook for some time to come.

G. F. ALFREY

THERMODYNAMICS AGAIN

Thermodynamics

An Advanced Treatment for Chemists and Physicists. By E. A. Guggenheim. Fifth, revised edition. Pp. xxiii + 390. (Amsterdam: North-Holland Publishing Company, 1967.) 86s.

THIS edition, the fifth in eighteen years, has the same virtues of clarity, brevity and authority that marked its predecessors.

There is a new chapter of two pages on systems in motion according to the special theory of relativity. Here the problem of the temperature of a moving body—a problem that has given rise to recent correspondence and an editorial in *Nature*—is characteristically disposed of in one sentence: “There is no need to mention temperature and indeed the property of temperature will depend on its precise definition”.

Much of the rest of the book has been revised in detail. The discussion of critical phenomena and of transitions of higher order, however, is essentially unchanged, although powerful inequalities, discovered in the past four years, have rendered obsolete all discussions before 1965.