

circular — if an animal displays parental care, its young, by definition, face an impoverished habitat.

To be fair, I suspect that Itô hopes to provoke others into making the necessary measurements, and like all attempts to force the bewildering variety of the living world into a manageable framework, his vision is certainly true in parts. Thus high, or low, fecundities (Chapter 1) do tend to be associated with particular types of survivorship curves (Chapter 2), generating particular patterns of population fluctuations (Chapter 3), and social systems (Chapters 4–6). But there are bound to be numerous exceptions, and in trying to force every example into one mould, the book sometimes makes difficult reading.

European and North American colleagues will also feel uneasy with those parts of the book which fail to incorporate

important concepts from their own contemporary literature. I noticed this particularly in Chapter 3, which deals with population fluctuations in a way that fails to reflect major advances of recent years.

I make these criticisms very reluctantly, because any book which increases the flow of ideas and information between groups of ecologists is to be welcomed. Nonetheless it must be said that this is not a good book to use with undergraduates, despite the fact that they may be more receptive to new ideas than teachers! But I do think that anybody interested in animal population dynamics and social behaviour should look at it, particularly for the richness and relative unfamiliarity of many of its principal characters. □

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The inconstant biological membrane

A. Silberberg

Mechanics and Thermodynamics of Biomembranes. By E. A. Evans and R. Skalak. Pp. 272. ISBN 0-8493-0127-0. (CRC Press/Blackwell Scientific: 1981.) \$34.95, £26.

MOST material systems are not mechanically simple. The stresses which arise cannot be expressed by the one- or two-parameter relationships which, nevertheless, have scored enormous practical successes. Much of fluid mechanics is based on the Navier–Stokes equations for an incompressible Newtonian fluid, and much of solid state deformation theory on a loss-less, purely elastic material constitutive equation.

The science of rheology has tended to bridge this gap in the engineering world, but in biology such complications are still mostly avoided. This is particularly reprehensible when, as is natural with living systems, movement of components, and indeed chemical reactions, have to be considered alongside any description of the stresses and strains which shape and confine the structural components. In developing the analysis of the chemical potential gradients along which transport of the various distinguishable chemical species will occur, the mechanical contribution is generally represented by a hydrostatic pressure gradient at most. Structural elements are taken out of consideration by being thought of as chemically inert and mechanically rigid.

This book by Evans and Skalak is thus a most welcome newcomer. It contains four main sections which, following an introduction, cover the kinematics, the dynamics and the thermodynamics of membranes; the final section summarizes the experimental situation. Some 100

references are given and a good index is also provided. The authors deal specifically with those membranes which confine cells or sub-cellular compartments, discussing the factors which mechanically govern the shape and thermodynamically will influence the stability of these systems.

This is, to my knowledge, the first systematic attempt to develop the considerations basic to the field in textbook form. The book is thus highly recommended to all workers in physiology and biophysics — to all scientists, in fact, who are dealing with the mechanics and thermodynamics of the interface in systems of heterogeneous and complex structure.

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Electron microscopy

● A new volume in the series *Practical Methods in Electron Microscopy*, edited by Audrey Glauert, has recently been published by Elsevier/North-Holland Biomedical Press. Volume 9, *Dynamic Experiments in the Electron Microscope* by E.P. Butler and K.F. Hale, deals with the study of the response of materials to a change in state, using the transmission electron microscope, and costs hbk Dfl. 195, \$95; pbk Dfl. 92, \$45.

● M.A. Hayat's *Principles and Techniques of Electron Microscopy: Biological Applications* has now appeared in a second edition. Like its predecessor, the aim of the new edition is to provide a foundation in the biochemical concepts underlying the preparation of specimens for transmission electron microscopy. Co-published by University Park Press and Edward Arnold, the book costs \$34.50, £27.50.

MeV volume

M.H. Key

Laser Interaction and Related Plasma Phenomena, Vol. 5. Edited by Helmut J. Schwarz *et al.* Pp. 850. ISBN 0-306-40545-8. (Plenum: 1981.) \$75, £47.25.

LASER plasma interactions at high levels of irradiance involve a fascinating variety of physical processes and phenomena. Plasma produced in this way has many significant applications, arising mainly from the extreme energy density available. Laser fusion is the major motivation of much of the world-wide activity, but basic physics investigations — for example into X-ray lasers, energy transport in high temperature gradients and the characteristics of matter at extreme pressures — are beneficiaries of the technical developments arising from laser fusion research.

It is difficult to produce books which adequately describe the state of the art in such a wide-ranging and fast-moving field. The well-tryed formula of a compilation of contributions from specialist authors has the best possibilities and the present volume is the latest in a series of this genre.

The old editorial team of H.J. Schwarz and H. Hora has been strengthened by M.J. Lubin and B. Yaakobi of the University of Rochester, and the book presents contributions from an internationally representative panel of 37 scientists who lectured at a workshop in 1979. I find that the book provides a better-organized selection of material than some of the earlier volumes; it has a mix of basic reviews and current research topics, and therefore offers something both for those researching in the same field and for those with a more general interest.

There are five major sections, covering lasers and alternative pulsed power sources, interaction experiments, general considerations for fusion, fusion-related experiments and interaction theory, and here the reader is given a fairly good guide to the topical issues of 1979–1980. The review material covers subjects such as new lasers, free electron lasers, light ion beams, new fusion fuels, high-density diagnostics, target manufacture, soliton theory, Rayleigh–Taylor instability, stimulated scattering and Stark broadening of high Z ion lines. It is generally authoritative and up to date. The descriptions of more detailed research activities have inevitably become somewhat dated, though specialists will find them useful as sources of reference to past work.

I feel researchers in the field will want access to this book as a valuable compendium of information, while non-specialists may wish to consult one or more of its review sections. □

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