



Ultrasonic Communication by Animals

G.D. SALES and J.D. PYE

Hardback : 1974 : 264 pages : illustrated : 412 11920 X : £4.95

The aim of this book is to provide an up to date review of the wide range of acoustic behaviour in animals that is purely or partially ultrasonic. The ultrasonic signals produced by a wide variety of animals are described together with the physiology and biophysics of sound production where this is known. The social significance of the signals is also discussed.

Practical Studies of Animal Development

F.S. BILLETT and A.E. WILD

Hardback : March 1975 : 256 pages : illustrated : 412 10360 5 : £4.80

The aims of this book are to serve both as a practical manual for, and as a general introduction to, the study of animal development. The practicals described vary both in the skills required and the time needed for completion. A special feature is the wide coverage of both invertebrates and vertebrates.

Biological Physics

D.C.S. WHITE

Hardback : January 1975 : 312 pages : illustrated : 412 12650 8 : £6.50

Limp cover : 412 13600 7 : £3.75

Biological Physics provides a lucid introduction to the physical principles normally encountered by undergraduate students taking courses in biology. It differs from many texts with similar titles in that it is basically a *biological* book dealing with physics, rather than a physics textbook without the unnecessary chapters.

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which he seems not entirely at home. But the compilation is impressive and uses a vast literature. Unfortunately, though, the bibliography is presented chapter by chapter in the sequence in which they are mentioned, so the location of references is an exasperating business. Mistakes and typographical errors are few and the book is well produced; but the price is far beyond the means of many of those who would wish to buy it.

J. S. Ryland

Life

Life—The Unfinished Experiment. By S. E. Luria. Pp. 167. (Scribner's Sons: New York, June 1973.) \$7.95.

SALVADOR LURIA is well known for his work in virology and molecular genetics. In 1969 he shared the Nobel Prize in Physiology with Delbrück and Hershey. His aim in the present book is to explain modern biology and its social relevance to the general reader.

The scope of Luria's book is superficially the same as Monod's *Chance and Necessity* but there are significant differences. The scientific parts of *Chance and Necessity* were too advanced for the general reader. Luria has attempted a more elementary account. He also deals less with metaphysical issues than Monod, and his social and ethical views are differently slanted. I believe that Luria has succeeded in producing a valuable and readable book, and that it could be usefully incorporated into science courses in schools and generalist courses in universities; and that it would be of interest to laymen and to some professional bioscientists.

Luria emphasises molecular aspects of biology, but not to the exclusion of organismic aspects. He builds up a masterly picture of biology, bringing out key concepts in lively, non-technical ways. Starting with an introduction to evolution theory, he goes on to genes, cells, bioenergetics, form and function in higher organisms, and biogenesis. He concludes by discussing social and philosophical issues connected with biology. All this he compresses into only 150 pages, without losing readability, by pruning out unnecessary detail and dealing only briefly with many of his points. Those with little previous biological knowledge will need supervision or complementary reading to appreciate the more subtle points. An apposite reading list is appended to the text.

Luria's underlying theme is "the dualism of the material nature of life's programme on the one hand and the historical nature of biological evolution on the other hand". In his chapter on evolution theory he first discusses the impact the theory has had on man's image of himself and of nature, and

then goes on to consider the scope and limitations of the theory. He emphasises the mutual interaction of individual and environment, and accepts the 'genetic assimilation' view that selection acts on phenotypes rather than on genotypes. In his chapters on heredity, he introduces the subject in a striking way by comparing modern genetics to the great generalisations of physics. At the same time, he points out the uniquely high degree of order in biological phenomena and its historically-derived nature. In each of the succeeding chapters, he also presents the subjects in stimulating and illuminating ways. He does not try to gloss over difficulties and uncertainties.

In the penultimate chapter, Luria discusses issues of medicine, population and genetic engineering. He considers the humane regulation of population growth to be of overriding importance, but recognises the great social and political problems involved. He discusses possible biological consequences of population control and maintains that eugenics programmes (apart from those meant to reduce serious genetic disorders) should be avoided for both social and biological reasons. Though recognising the great technical obstacles to direct genetic intervention in man (such as genetic engineering and cloning), he considers that "in science, once a task has been clearly defined, its accomplishment is generally only a matter of time", and that some genetic intervention may be in medical use within 30 years. And he explores the social and ethical problems that this would raise in our "competitive, caste-ridden, power-dominated society".

In the final chapter, Luria gives a stimulating glimpse into some philosophical issues relating to biology, such as language and brain structure, nativism and learning, biological and cultural evolution, determinism and free will, values, and existential dilemmas. He emphasises the uniqueness of every human individual. He locates the central dilemma of life science as the relations of human purpose, values and will to the fortuitous nature of the evolutionary process. He considers the human brain to have arisen through a process in which "evolution has dialectically surpassed and denied its own past history". Inevitably, various controversial points arise. Among these, I believe that Luria's treatment of existential problems in terms of natural selection is weak; and I would like to see the physicalist position—which he presupposed throughout—explicated and examined in relation to possible counter-evidence (from, for example, parapsychology). In spite of such criticism, my impression is of a well balanced, humanly sensitive, and penetrating world-view.

Robin Monro