Book Reviews

Atoms and People. Ralph E. Lapp. Harper, New York, 1956. 304 pp. $4.

Facing the Atomic Future. E. W. Titterton. Macmillan, London; St. Martin's Press, New York, 1956. 379 pp. Illus. + plates. $5.

These two timely books deal with the history of the development of nuclear energy and, more important, with its social, moral, and political implications. Both authors are nuclear scientists and, as men of integrity and good will, are profoundly impressed by the fact that nuclear power for war is a stark reality, while practical and economic nuclear power for peaceful uses is still in the future.

Lapp's book provides the vivid reading of a novel and is as difficult to lay down as a novel would be. Step by step, Lapp traces the story of the development of the theory of the chain reaction, the first pile, the first bomb, and finally the complete family of nuclear weapons. Having served in the Pentagon as an adviser for the Defense Department, Lapp writes intimately, and often most critically, of political maneuverings in the unfolding story of nuclear energy.

Titterton's volume is less easy to read but covers in a scholarly and more detailed way the same story. As an Australian, Titterton discusses at every step the specific implications for his own country. Tables, formulas and graphs abound in the book, and there are a number of pertinent photographic illustrations.

Both authors devote space to thermonuclear reactions, not only as agents of destruction, but as possible sources of industrial power. Both men are impressed with the urgent need for the development of an adequate civil defense. Both discuss in detail the possibilities and limitations of diverse nuclear machines as sources of industrial power, stressing the hazards, the economic feasibility, and the difficulties as well as the hopes along these lines. Both books are concerned with the increasingly critical problem of the safe disposal of atomic wastes.

Both authors end their books with careful, thought-provoking discussions of the social and ethical problems raised by the availability of nuclear energy. A dilemma has in fact been created, on the one hand by man's increasing faith in his capacity to expand his technologic and scientific horizons, and on the other by his mounting skepticism in regard to his ability to solve the resulting social problems. It would be indeed tragically ironic if the same thermonuclear reactions which, by taking place in the sun, make possible our very existence on this earth should, through our own social bungling, lead to our extinction. Scientists in all fields will do well to give thoughtful consideration to both of these books.

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Transport and Accumulation in Biological Systems. E. J. Harris. Academic Press, New York; Butterworths, London, 1956. 291 pp. Illus.+plates. $7.80.

The increasing emphasis currently being given to solute transfer studies in biological systems is doubtless the result of a recognition that such processes are as basic to our understanding of cell function as are those biochemical reactions more directly concerned with metabolism. For this reason, this book should be especially welcomed by workers who desire a comprehensive survey of the rather large number of papers on ion and molecule transport that have appeared in recent years. The scope of this book is perhaps best given by mentioning the number of pages devoted to particular aspects of the problem: membrane structure and penetration (14), the distribution and movements of water (41), the distribution of ions (31), blood cells (47), amphibian skins (15), muscle (15), mitochondria (4), ion movement in various tissues (32), nonmyelinated nerve (26), medullated nerve (26), plant cells and yeast (12).

A useful introduction to the ways by which both molecules and ions may be expected to move in membranes is given in a rather thorough treatment of the physical chemistry of osmotic processes and ion diffusion. The following chapters consider transport, both passive and active, in a variety of cells. Emphasis is on recent publications that deal with measured unidirectional tracer fluxes and also on red blood cell studies, a field of special interest to the author; this does not necessarily mean that our understanding of active transport in these cells is better than it is for others, rather the reverse because the additional complication of an enormously rapid anion transfer, as compared with cation transfer rates, surely makes the analysis of the membrane more complex.

The discussion of many of the points concerned with the experimental data is generally quite critical, and the author refrains from presenting a particular point of view; indeed the subject matter is hardly amenable to a comprehensive or general treatment, for present-day characterization of the processes that drive ions against electrochemical gradients can be described only as mysterious. On the other hand, tremendous progress has been made in ascertaining the relationships that must exist between ion movements and membrane potential, as the elegant work of the Cambridge physiologists shows. Emphasis has been properly given by the author to the fact that recent experimental evidence can be interpreted as showing that tracers do not measure true fluxes in the presence of a net flux across the membrane; it may be questioned whether this effect can exist for water movement across the membrane, as Harris suggests, but this is one of the few points where one might take issue with the treatment in a book that I warmly recommend.

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Introduction to Electronic Analogue Computers. C. A. A. Wass. McGraw-Hill, New York; Pergamon, London, 1955. x + 237 pp. Illus. $6.50.

The author of this book has done an excellent job of presenting the basic principles of analog computation. It is recommended for the reader who is interested in a general survey of electronic analog computation methods and techniques as well as for the beginner entering the computer field. The book sticks to basic principles rather than going into the details required by those who have a serious interest in designing and building computers.

The subject matter is essentially limited to electronic analog computers; other types, such as network analyzers, mechanical devices, and electromechan-