congratulated on having achieved her aim of providing for palaeoethnobotanists a much more comprehensive and systematic guide to the identification of plant remains than has been available until now and, moreover, of providing at the same time a very welcome source book of information for the general scientific reader.

A. R. CLAPHAM

The Excitable Heart

Electrical Phenomena in the Heart. Edited by Walmor C. De Mello. Pp. xv+415. (Academic: New York and London, October 1972.) $26.

NEW blood has kept the field of cardiac electrophysiology fertile and by drawing upon it Professor De Mello has ensured the success of his enterprise, although the absence of a preface is a pity. Those starting a career in cellular physiology and biophysics, and to whom the book is addressed, need to know how the editor views the subject as a whole: better to expose the logic or hunch by which the chapters have been strung together than to imply questionable connexions by tacit juxtaposition.

The volume opens with "Electrical Properties of Embryonic Heart Cells" by N. Sperelakis. From the biological point of view this is a rational beginning, but since familiarity with the electrophysiology of the adult tissue is required for the appreciation of this informative article, some readers will find W. K. Berger's chapter on "Ultrastructure and Function of Cellular Contacts" an easier starting point. The morphology of cardiac muscle and the mechanism of excitation spread are well reviewed therein. H. Fozzard's lucid article on membrane capacity of cardiac muscle cells, out of place as chapter 8, might well be read next since structural considerations enter closely into the interpretation of the measurements.

The task of exposing the nature of the cardiac action potential is shared out between J. Dudel who deals mainly with the fast excitation process, and D. Noble and R. W. Tsien who cover the events during the plateau phase in a helpfully interpretative way. The generation of action potentials in spontaneously beating Purkinje and auricle fibres is touched upon briefly by both Dudel and Noble and Tsien. The reader pursuing the leads to voltage-clamp experiments given in their articles will find that the pacemaker potential can also be ascribed to voltage and time-dependent conductance changes controlling the downhill flow of ions. Quite a different hypothesis is advanced by T. C. West who, in writing on "The Electrophysiology of the Sinoatrial Node", holds the main brief to deal with cardiac autorhythmicity. On the basis mainly of the high temperature coefficient of the heart rate, he implicates active inward transport of potassium ions in the fall of K permeability during the diastolic interval. As an alternative hypothesis this may well require consideration, but it is puzzling why the voltage-clamp experiments bearing on the problem of autorhythmicity have been totally ignored. Presumably the editor was left to turn diverse views to constructive ends; but in the event this task falls upon the reader. From the touchlines the editor does, however, bias the issue by setting H. G. Haas's article on "Active Ion Transport" immediately before that on the sinoatrial node, as if the consideration of active transport were an essential preliminary to the problem of autorhythmicity.

Taken by itself the chapter on active transport makes rewarding reading. The emphasis placed on the great sensitivity of the cardiac action potential to variations in the metabolic state of the cells is well placed as this remains a pressing problem. The case for the participation of metabolically driven currents in shaping the action potential is, however, not compelling. A less direct mechanism, say a change in the intracellular concentration of an ion determining a surface potential on the inner face of the excitable membrane, could equally well be at work.

Under the title "Cardiac Innervation and Synaptic Transmission" M. Anderson and J. del Castillo cover the recent revival of histological research into the rich innervation of the specialized regions of the heart. The high chemosensitivity of natural pacemaker fibres permitted some time ago the demonstration of the mode of action of acetylcholine. The more recent work on the inotrophic action of adrenaline is well summarized, but the treatment of the chronotrophic action suffers from the inadequate cover given earlier in the book to the known kinetics of the pacemaker current.

From a perceptive chapter on atrioventricular transmission by C. Mendez and G. R. Moe it becomes clear that the slow inward current system plays an important part in the propagation of excitation through the node. At this point one misses in this otherwise laudable multinational book a contribution from one of the French laboratories where the slow inward current system has been explored.

After interesting chapters on "Comparative Aspects of Electrogenesis" by F. V. McCann and on "The Healing-Over Process" by W. C. De Mello the volume is rounded off with a comprehensive article on "Calcium Movements and Excitation-Contraction Coupling" by J. B. Bassingthwaite and H. Reuter.

O. F. HUTTER

Feeding Children

Malnutrition and Retarded Human Development. By S. L. Manocha. Pp. xv+382. (Charles C. Thomas: Springfield, Illinois, September 1972.) $19.75.

WE have known since the early years of this century that good nutrition has something to do with physical and mental development, and in many countries practical schemes to feed growing children as well as possible have been introduced. During the past twenty years or so during which international concern over the world food situation has intensified there has been increasing effort to solve questions relating to the nutritional needs of children, with the general aim that children everywhere shall be adequately nourished.

Many scientific problems remain to be solved, but much is now known about the nutritional needs of children and how to meet them, and Dr Manocha has done a useful service in assembling so much material in this review. His book, which is intended for the educated layman as well as the professional reader, is clearly and simply written. He discusses the biochemistry and physiology of human development, particularly of the brain, environmental influences, including socio-economic factors, maternal nutrition and food habits, and such practical matters as government schemes to alleviate malnutrition, guidance on the direction and treatment of the diseases of protein-energy malnutrition, and nutrition education.

Dr Manocha writes from an international point of view and shows by the number and variety of the references he cites that he has crossed national boundaries and brought together relevant material from established and active workers in all continents. Each of the nine chapters of the work ends with a list of authoritative references ranging in time from the early years of international anxiety about malnutrition in children to 1971. These lists would by themselves be invaluable to any student of nutrition.

One could point to minor errors in the names of certain authors and to the omission of ideas that appear to be becoming of crucial importance, such as how the overriding socio-economic problems of modern society are to be solved if proper physical and mental development is ever to be achieved for all human beings. But to do this would be to carp. This book can be recommended as a useful, comprehensive, simply written review of an important and topical subject. It could be read with profit by anyone who wishes to understand more about one of the most intractable subjects of our age.

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