reviews

EXCITABLE tissue, that is, nerve and muscle, should not be tampered with lightly. True, there are all sorts of reasonable humanitarian incentives such as the existence of schizophrenia or heart failure but there is the lurking danger that the cells will take over and become the passion and obsession of the investigator. Generally a physiologist and often inadequately trained in physics and mathematics, he seems from then onwards doomed to a life of frequently frustrating self-education in those disciplines. He should find this book very helpful.

The first half is devoted to applications of linear cable theory. It is an unfortunate fact that even the simplest model of a nerve fibre (which does not even attempt to stimulate the biologically important process of lossless transmission) leads to a partial differential equation needing operational or transform methods for its solution. To follow this part of the book the reader must reconcile himself to the need to be familiar with the Laplace transform method. This done, however, he will find a very clear account of the classical study of nerve by Hodgkin and Rushton, originally published in 1946, its application to the analysis of endplate potentials by Fatt and Katz and its elaboration by Rall to synaptic potentials in central neurones regarded as

Lots of potential

Electric Current Flow in Excitable Cells. By J. B. Jack, D. Noble and R. W. Tsien. Pp. xvi+502. (Clarendon: Oxford, Oxford University: London, August 1975.) £18.00.

geometrically non-uniform cables. The authors' intention was evidently not to produce a neat compendium of formulae for immediate numerical exploitation. On the contrary, there is a certain deliberate and, I think, attractive untidiness about the treatment, some results being stated without proof, others being derived in several different ways with different degrees of completeness; some points are dwelt on because of their mathematical, and others because of their physiological interest.

The second half of the book is concerned with action potentials. Dealt with in turn are the non-linear electrical properties of membranes—which are, of course, what make action potentials possible—the excitation process, conduction and repetitive activity. As is well known, non-linear differential

equations do not in general succumb to analytical methods, but as the authors show in their last chapter, such methods can produce significant information if the function representing the electrical behaviour of the membrane is chosen with sufficient ingenuity. On a first reading, this half of the book was somewhat less satisfactory. Parts of the chapter on non-linear membrane properties seem unnecessarily difficult to follow and the reader is too frequently directed to external references for points of substance. In the chapter on repetitive activity, the theoretical discussion sometimes seems too weighty for the experimental data. These are minor criticisms, however, in the light of the enormous amount of material presented.

The book is extremely well written at a detailed level. It is also well produced: among the very few mathematical misprints I noticed, only one, the omission of a pair of brackets from equation 3.60, was catastrophic. In their introduction the authors write that they were primarily motivated "... by the desire to make what is admittedly one of the most difficult areas of physiological theory less forbidding and more accessible ...". I think that they have succeeded.

B. L. Ginsborg

THIS book presents to a wider audience the papers prepared for a small international symposium held in March of this year. There are three introductory papers on the immune response, auto-immune phenomena and side effects of immunisation by insulin as a model system. All will be of interest to endocrinologists whose knowledge of immunology requires updating. Eight papers are grouped under the heading "Basic Research", and vary considerably in scope, content and value, ranging from quite lengthy reviews of original work and the published literature through excellent short reports of well-defined, although limited, projects to scrappy accounts of rather diffuse studies, so incomplete in performance or reporting (or both) as to be of little value. The four concluding papers deal with attempted or projected practical applications and here the high standard set by the introductory papers is maintained. Topics discussed are: immunisation with a steroid hormone-protein conjugate to control the

Immunological use for hormones

Immunisation with Hormones in Reproduction Research. (Proceedings of the International Symposium.) Edited by E. Nieschlag. Pp. x+253. (North-Holland: Amsterdam and Oxford; American Elsevier: New York, 1975.) Dfl.55; \$22.95.

development of boar taint in maturing intact male pigs; immunisation with gonadotrophins to control reproduction in dogs; the prospects for and early experiments on the control of human fertility by immunisation with the protein hormone produced by the early human conceptus chorionic gonadotrophin; and a brief account of the use of homologous antibodies raised in a primate against pituitary luteinising hormone from a subprimate to reversibly control the development of the corpus luteum in sterile cycles and to

terminate pregnancy in fertile cycles in other members of the same primate species.

The papers were clearly written by enthusiasts yet surprisingly the common feature of many of them is the emphasis on the difficulties and uncertainties of both the practical procedures and of the interpretation of the results obtained. This impression might well have been stronger had the discussions after each paper been reported in full rather than in the form of a quite unrewarding and frustrating synopsis. Nonetheless this is a useful book for any biologist who wants a recent account of work in an area which is still of great interest even though it seems to be rather less promising, in terms of either basic research or practical application, than it was hoped it would be. The production of the book, from the remarkably error-free typescripts supplied by the participants, is excellent and has been commendably prompt.

K. Brown-Grant