

BOOK REVIEWS

Cells and Cancer

The Cell Cycle and Cancer. Edited by Renato Baserga. Pp. xii+481. (Marcel Dekker: New York, June 1971.) \$29.50.

I DO not recollect having previously reviewed a scientific book on a topical subject which carried on its jacket a reproduction of a Renaissance painting. The departure in this instance may reflect the tastes of Dr Baserga, whose own contributions to the volume are liberally sprinkled with classical allusions. The editor's imprint on this volume is unusual in another respect in that, instead of writing a formal introductory chapter, he has interspersed the twelve chapters with explanatory and introductory sections. This practice, which Dr Baserga attributes to one of his teachers, might well be copied by editors of other symposium volumes. The reason for these connecting sections, of course, is to try to link together the chapters written in different styles by different authors. In fact, this particular book concentrates on one relatively small topic and, therefore, is quite coherent. Indeed its principal shortcoming is that there is a fair amount of overlap in it; for example, the labelled mitosis method for studying the cell cycle is described many times. This repetitiveness, which may be unavoidable in a volume of this kind, is the chief criticism one can make of it.

The book contains twelve excellent essays on different aspects of the cell cycle, which among them provide an almost complete review of the subject. The first three chapters, by Lipkin, Blackett and Mendelson and Takahashi, are concerned with mathematical aspects of cell cycle kinetics. The next three chapters are concerned with the cell cycle in different normal and diseased states. The cell cycle in cancer cells is discussed by Gavosto and Pileri, in differentiation by Malamud and in response to hormones in different organs by Epifinova. The next four chapters are concerned chiefly with biochemical aspects of the cell cycle. Cooper discusses biochemical alterations accompanying the initiation of growth; Vendrely, cytophotometry and histochemistry in the cell cycle; Mueller, biochemical aspects of the G1 and S intervals; and Tobey, Petersen and Anderson, the biochemistry of G2 and mitosis. Most of the first ten chapters

are devoted to reviewing material, much of which has previously appeared in other books. The eleventh chapter, by Skipper, on the cell cycle and chemotherapy of cancer, is refreshing in that it not only analyses this topic, but also introduces some new ideas about it. The final chapter, on radiobiology and the cell cycle, by Frindel and Tubiana is an excellent, comprehensive review of this large and complex subject.

This is a first rate source book for people working on aspects of the cell cycle. Most of the discussion is at a fairly advanced level and the views expressed seem generally sound. I would take issue with only one or two points (both of those mentioned voiced by the editor). Is it really true that the theory of contact inhibition has been demolished and, by implication, has nothing to contribute to the understanding of cancer (page 55)? Is there justification for suggesting that the differential effects of hydroxyurea on cells in S phase and in G0 may indicate both a metabolic diversity between G0 and G1 cells and that the S phase may be different in different cells (page 191)?

What general impression does one gain about the field by reading this book? My impression is that, although an enormous amount of work of very high quality has been done, we are only a little further forward in the understanding of the mechanism of the cell cycle than we were in 1963 when Howard and Pelc described it. What we have perhaps come to appreciate is the great complexity of the problems. The reproduction on the front cover is of Raphael's St George and the Dragon. St George's allegorical identity is obscure but I imagine the dragon represents the cancer problem. Is the maiden praying for divine intervention in the background possibly intended to represent scientists engaged in studies of the cell cycle?

JOHN PAUL

Receptor Physiology

Principles of Receptor Physiology. Edited by W. R. Lowenstein. Pp. xii+600. (Springer-Verlag: Berlin and New York, 1971.) 134.40 DM; \$37.

The Handbook of Receptor Physiology, to be compiled in eight sections, of which this volume is the first, will repre-

sent a major achievement in the literature of physiology.

The ability of the cell or organism to perceive, analyse and react to external stimuli is clearly one of the most important functions of living systems: in particular, the property of chemosensitivity must have been of early evolutionary significance. The wide variety of incoming stimuli has necessitated the development of a large number of sensory receptors, all of which serve directly or indirectly to transduce the incoming stimuli into trains of sensory impulses, a common output, a fact recognized by Adrian almost fifty years ago and expressed in the frequency code hypothesis. The various transducing mechanisms pose a well recognized and inspiring challenge to which workers in many disciplines are responding with vigour. Unquestionably, more remains to be learnt than has been learnt hitherto and as Ottoson and Shepherd (chapter 15) note for the well investigated muscle spindle, "the basic questions underlying the transducer process are still kept by the spindle as a well guarded secret of its own". The exquisite sensitivity of many transducer mechanisms (insect sex pheromones, reptilian heat receptors) poses the additional question of what molecular gyrations can be responsible for detecting and responding to such low level stimuli? The wide range of input stimuli to which the sensory systems react poses another severe challenge to the understanding of these input-output systems.

This volume is designed to serve as an introduction to receptor physiology by introducing a selection of topics, some of which will be covered in greater detail in subsequent volumes, and which are intended to introduce and survey the field of receptor physiology. This volume includes seventeen chapters dealing with general characteristics of excitable cells, mechanochemical transducers, light perception mechanisms, the analysis of stimulus intensity and peripheral receptor organization. Nachmanson's chapter deals with the roles of the proteins of the acetylcholine receptor in transducing bioelectric events: it contains much useful information on the fruitful applications by Changeux and others of the allosterism concept to chemically sensitive membranes. Yet much of the chapter is