

The book represents a good survey of the whole field with most of the literature up to mid 1976 being under review. There is one curious and slightly redundant feature about the book. Nearly one-quarter of the text is occupied with a particularly excellent chapter by Godman and Miranda on the effects of these compounds on contractility: their chapter has the running title 'Visible effects of cytochalasin', but it is in fact a review of nearly the whole field of the biological effects of these molecules. Consequently there is much overlap and repetition between it and some 11 of the other 17 chapters.

The first 2 chapters deal with production and preparation (Tanenbaum) and the chemistry (Tamm) of these compounds. There are then 9 chapters which precede that by Godman and Miranda on various biological effects, i.e., on toxicity (Thilly *et al.*), on

morphogenetic processes (Spooner, Bluemink), on cell division and chromosomal abnormalities (Schroeder, O'Neill), on effects on exo- and endo-cytosis (Davies and Allison), on the use of these substances to enucleate cells (Poste and Lyon), on their effects on immune systems (Henney), and on their effects on plant and lower eukaryote cells (Thomas). Four of the final 5 chapters deal with the biochemistry of these compounds, dealing in particular with the important questions of the processes that may be affected by them (Weihsing, Plagemann *et al.*, Lin and Tannenbaum). The use of these substances in studying virus-host cell interactions are discussed (Koch and Koch).

This book seems to be particularly well edited and free from error, but is poorly served by its indexer.

Adam Curtis

Essays in Neurochemistry and Neuropharmacology

Volume 3

Edited by M. B. H. Youdim, W. Lovenberg, D. F. Sharman and J. R. Lagnado
John Wiley; London, New York, Sydney, Toronto, 1977
227 pages, £10.50; \$29.25

Essays in Neurochemistry and Neuropharmacology have already proved to be a successful series dealing with up-to-date specific problems arising in the field. They are intended for advanced undergraduate students and research workers, preferably with some knowledge of neurobiology. The main theme of volume 3 is on the role of monoaminergic neurotransmitters. This subject has grown enormously following the discovery of sensitive histochemical methods for demonstrating different monoaminergic pathways and of selective lesioning techniques. These procedures have established the complex pattern of interaction between different transmitter-containing neural networks. As, for example, shown in the fifth essay by Lloyd, nigro-striatal dopaminergic fibres inhibit striatal cholinergic neurons and cortical acetylcholine activity is stimulated by meso-limbic dopamine containing pathways,

but in addition GABA and 5HT projections are probably involved. There is evidence that such systems are probably regulated by feedback central mechanisms, and here the technique of single cell recording has been especially valuable (chapter 1). Unravelling details of the different pathways is exceedingly difficult so that use of readily available model preparations is most attractive. There is for example the intriguing possibility that blood platelets in some respects mimic aminergic neurons. In his essay Pletscher shows that platelets serve as a particularly useful model of neuronal 5HT metabolism and help simplify comparable studies on CNS transmitters uptake, release and storage mechanisms.

Dietary tryptophan can modify brain 5HT synthesis and thus alter function. This has been a controversial subject particularly in relation to the effect of

free and bound plasma tryptophan concentration but in his essay Green brings the different points of view together and indicates the relevance of this research to human physiology.

Certain neurons in the peripheral nervous system require a protein known as the nerve growth factor for growth and maintenance. This remarkable protein is obtained from such unexpected sources as snake venom and mouse submaxillary gland. It has been isolated in two forms and unexpectedly the β -subunit has been found to have some homology with proinsulin. Although the mode of action of NGF is not known it is thought to act on membrane surface receptors yet it stimulates synthesis of tyrosine hydroxylase possibly via cyclic AMP. There are suggestions that changes in serum NGF may be of significance in diagnosis of tumours of the nervous system.

In the final essay Jane Mellanby discusses the

nature of memory in animals and critically reviews possible mechanisms involved in storage and retrieval. She concludes that as yet no experiments have definitely established the molecular basis of the memory trace. Experiments on stimulated cockroach preparations and some of Deutsch's important research implicate the cholinergic system in memory. Inhibition of brain acetylcholinesterase can interfere with the retrieval of a learned discrimination task. It is likely that permanent changes in synaptic efficacy underlie memory and that this involves protein synthesis. Only two proteins may be necessary — a synapse activator and an inhibitor operating by activation or inhibition of a large number of synapses.

It is evident that this relatively inexpensive volume provides a stimulating series of essays on current advances in neuropharmacology.

A. N. Davison

Caffeine and Chromosomes

by Bengt A. Kihlman

Elsevier; Amsterdam, New York, 1977

xviii + 504 pages, Dfl 155.000; \$63.25

Although the title suggests a dauntingly specialised field of interest, in fact, one-third of the book is devoted to caffeine, one-third to chromosomes, and only the final third deals with the interaction between the two. Thus, anybody with an exclusive interest in only one of the major subjects might still find this a valuable source of information.

The isolation of caffeine and its synthesis and occurrence in plants is a natural starting point for the text, and it then continues with the pharmacology of caffeine and related methylxanthines. Rather disappointingly, perhaps, this latter subject is dealt with largely by quoting and referencing from other major reviews. The section on caffeine ends with a fascinating account of the history of coffee drinking, and of the many other caffeine-containing beverages which are drunk in various societies in different parts of the world.

The text now moves on to chromosomes. Their basic structure and appearance are fully described, as are the chemistry of DNA and its replication. Genetic recombination mechanisms precede two very strong chapters on chromosomal mutations and aberrations, and their link with DNA damage and repair mechanisms. The various toxic agents discussed include ultraviolet light, ionizing radiation, and mono- and di-functional alkylating agents. The problem with this large, and albeit excellently written and presented section, is that it may be just a little lacking in step-by-step explanation for the informed novice, and at the same time superfluous to the specialist.

The final section deals with caffeine effects on chromosomes in many different cell types. This is introduced by an analysis of the physico-chemical properties of caffeine at the molecular level. It soon becomes clear that even sensitive cell types (which