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

fortunately do not include human) are not affected until caffeine concentrations rise well above those likely to be attained by even the most pathologically addicted coffee buff. It is also clear that phosphodiesterase inhibition is not an important factor in the damaging effects on chromosomes.

The author's considerable personal contribution in this field, particularly his studies on plant cells, enlivens the whole section, and it enables him to set current debates in a very realistic context. Particularly interesting are the studies of caffeine effects on chromosomes damaged by other agents such as ultraviolet light or ionizing radiations.

All in all, certainly not a standard textbook, nor a book aimed at the lay public, but a well presented personal account of the author's own field of interest and knowledge. Those concerned in the coffee trade will be delighted at the final conclusion that coffee drinking cannot be shown to have any significant damaging effect on human chromosomes.

J. Halliday

Translation of Natural and Synthetic Polynucleotides

Edited by A. B. Legocki
Elsevier/North-Holland Biomedical Press; Amsterdam, New York, 1978
ii + 422 pages. Dfl. 153.00; $66.75

This book certainly brought to the fore some thoughts that have been disturbing me, and no doubt others, for some time. Here we have the guts of a series of about 70 papers presented at a Symposium in Poznan in May 1977 which have been published after a delay of about a year. The Symposium dealt with an important, if comparatively narrow, area of the field of protein synthesis but there is little in the way of a bird's eye view of the current state of the art which could have been useful to the non-specialist. The net result is that the volume engenders a feeling of gratitude on the part of the reviewer for a hard labour by all concerned with the publication but a query as to the nature of the likely readers. I suspect that these will be fellow researchers who will particularly appreciate the opportunity of getting to know a little more of the interests of their colleagues in Eastern Europe.

Then one turns to the question of price. Certainly in terms of the cost of books that one's Medical School is likely to buy on a limited budget, $67 is excessive. How could one set about convincing one's colleagues in other departments that this is money well spent. In short one could not with any chance of success, so that an old hand reserves his ammunition for another day and does not try. On the other hand if one compares the price with the cost of biochemicals everything seems more reasonable; quite an interesting survey of the field for the price of 100 μCi of ^{14}C-labelled amino acid. Perhaps our trouble is that we tend to think of books like this in terms of library budgets whereas they should be competing with the budget for reagents for they should enable us to do our experiments better. The conclusion is that by going through an agonizing reappraisal I can justify the purchase always assuming that the bureaucrats allow one to do so.

Dr Legocki who organized the meeting edited the Symposium, and contributed papers, obviously did well and I have heard excellent reports of the meeting. The papers were divided into six sections:

(1) Regulation of Translation;
(2) Role of the initiation factors in polypeptide synthesis;
(3) Elongation of polypeptide chains;
(4) Translation of cellular and viral RNA;
(5) Characterization of translational apparatus;
(6) Application of gene transfer for biological studies.

The papers that particularly caught my eye are those by S. Ochoa on 'Regulation of Translation' in which