

Synaptic transmitter substances

Neurotransmitter Amino Acids. By Neil Davidson. Pp. viii+179. (Academic: London and New York, 1976.) £5; \$12.75.

IN the past ten years there has been a rapidly growing interest in certain amino acids such as GABA, glycine and glutamate which are now generally believed to be important synaptic transmitter substances in the vertebrate central nervous system. Neil Davidson has undertaken the formidable task of writing a short book in which he aims to cover all aspects of neurobiology relevant to these amino acid transmitters.

The three opening chapters, which together occupy just over two-thirds of the book, provide an excellent account of the evidence that glutamate and aspartate, glycine, and GABA, are central transmitters. The references are usually well chosen but it is surprising that there is no mention of *N*-methionine or the immunohistochemical localisation of glutamate decarboxylase (GAD). The latter omission is particularly surprising since the localisation of GAD is potentially a valuable method of identifying GABA-operated synapses.

The author is at his critical best when discussing problems of electrophysiology and particularly the interpretation of experiments in which drugs are applied to neurones by iontophoresis. More neurochemical problems involving subcellular distribution, autoradiography and uptake, however, are not so critically assessed. For example, the author suggests that the presence of a high affinity uptake mechanism is a criteria for an amino acid transmitter, a view against which there is now much evidence.

There is an adequate chapter on taurine but the account of amino acids in retinal neurotransmission is rather disappointing. The role of GABA in the retina is discussed but taurine, glutamate and aspartate are barely mentioned, although there is much inferential evidence that they may be retinal transmitter substances.

The last two chapters provide an excellent account of the possible role of amino acids in presynaptic inhibition and a review of the behavioural and clinical correlations in studies of the neurotransmitter amino acids.

The book has a rather large number of typographical errors but of more consequence is the use of a bewildering number of units. For example, the concentrations of amino acids are expressed in at least five ways making

ready comparisons difficult. It would be helpful if in future editions the author would recalculate amino acid levels in one unit such as $\mu\text{mol g}^{-1}$. These are, however, minor criticisms, and the author is to be congratulated on producing a very readable introduction to amino acid transmitters. This book will be of great value to both undergraduate and postgraduate students, and I suspect that many involved in research on amino acid transmitters will keep a copy of this book readily available.

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Gerontological observations

The Ageing of Connective Tissue. By David A. Hall. Pp. vi+204. (Academic: London and New York, 1976.) £4.80; \$10.50.

OVER the past decade considerable advances have been made in our understanding of the biosynthesis and structure of the components of connective tissue. The deterioration of connective tissue is an obvious fact of ageing, and connective tissue biochemists should be encouraged to apply this new fundamental knowledge and accelerate the emergence of gerontology from its classical descriptive phase. Certainly it is becoming increasingly obvious that any breakthrough in the understanding of ageing can only come from studies at the molecular level. Dr Hall has therefore chosen his time well to write his monograph.

The book is well organised to provide the reader firstly with a brief resumé of the current theories of ageing and then with an overall view of the breadth of involvement of connective tissue components in various tissues, starting at the macroscopic level and working gradually down to the complex molecular level.

The book does, however, contain a number of errors, some obvious and some not so: for example, the gal-glc disaccharide is stated as being attached to hydroxyproline instead of hydroxylysine; the statement that $(\alpha_2)_3$ exists in tissues; the stated presence of hydroxylysine in elastin; and a number of incorrect cross-link formulae. There are also a number of surprises: for example, quotation of the old, unconfirmed observation that cellulose is present in older human skin; the electron micrograph picture of meta-collagen (thermally denatured skin collagen); the considerable over-emphasis on pseudo-elastin (an unfortunate

name, since it is surely no more than highly cross-linked impure collagen). The statement that elastase, a serine protease similar to chymotrypsin, has no effect on collagen is incorrect, a fact which throws some doubts on the conclusions drawn from these experiments.

I did not, therefore, feel that the promise of the first half of the book was fulfilled when the biochemical basis of the age changes was discussed. More importantly the emphasis in this part of the book on old unconfirmed and often confusing work, together with the numerous errors of fact that have been overlooked, mean that the book has to be read with considerable wariness. This is particularly important since the stage is now set—and Dr Hall has played no small part in this—for some critical studies on the role of connective tissue in the ageing process. Despite these reservations, it is hoped that this compact and inexpensive book will engender the right kind of enthusiasm for establishing the biochemical and molecular basis for gerontological observations.

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