

Acetylcholine synthesis

Acetylcholine Synthesis in Neurons. By S. Tuček. Pp. 259. (Chapman and Hall: London, 1978.) £15.

In recent years several excellent books on cholinergic mechanisms have been published (for example, *Biology of Cholinergic Function*, edited by A. M. Goldberg, I. Hanin, Raven: New York, 1976; *Neuromuscular Junction Handbook of Experimental Pharmacology*, 42, edited by E. Zaimis, Springer: Berlin, 1976). As these books have covered many topics of cholinergic transmission in more or less detail, one might wonder whether there is a need for another book on acetylcholine. However, the present monograph aims to be an addition to, rather than a substitute for its forerunners, by giving a detailed analysis of many aspects of transmitter synthesis, a subject which has not yet received the degree of attention it probably deserves. In my opinion the book fulfils its aim in an elegant manner. In the first place it is extremely readable, if only it were for the fact that it measures less than 200 pages of text, in contrast to its more corpulent counterparts, where the busy reader may hesitate reading the full contents at leisure. If one takes into account its compact size the book is admirable in offering so much detail with such clarity. The author never seems to be in a hurry when explaining difficult matters; when there is no way out of a problem, as is often the case with conflicting evidence, he treats the subject with justified economy.

The book sets out with two chapters which nicely summarise what is known about choline acetyltransferase. Among other things the physical and enzymic properties of this protein are discussed, together with its presence in nerves and also in some non-nervous tissues, and its transport in cholinergic axons. Subsequently, there are two very informative chapters devoted to the supply of acetyl and choline moieties which finally form the acetylcholine molecule. The supply of choline and choline-containing substances to the nerves (with special attention to the brain) and the subsequent neuronal uptake of free choline are described, and the problem is discussed how, or rather in what chemical form, activated acetyl groups migrate through the mitochondrial membrane into the cell sap of the nerve terminal. These chapters are followed by a survey of what is known about the organisation and control of acetylcholine synthesis. This actually forms the body of the book, and is also the most interesting part.

In addition to synthesis, the storage and release of acetylcholine are briefly discussed, as there are good reasons to believe that storage and release are intimately connected with the synthetic process. According to the author the synthesis of acetylcholine is probably controlled by mass action, enough choline acetyltransferase being present to provide a rapid recovery from disturbances of equilibrium caused by release of transmitter. High affinity uptake of choline and release of activated acetyl groups by the mitochondrion may represent additional factors in the mechanism controlling acetylcholine synthesis. The turnover of acetylcholine in the living brain receives little attention in this chapter and perhaps some readers will regret this. A full discussion of this subject would have been redundant, because it has been extensively reviewed recently by I. Hanin and E. Costa in a chapter of *Biology of Cholinergic Function*,

cited above. The last chapter of the book treats, among other things, the changes of choline acetyltransferase during development and ageing, and during Wallerian degeneration.

The book provides an extensive list of references (papers as recently as 1977 are referenced), which, so far as I have been able to judge, covers practically all that has been published in the field described in the book. It is the kind of reference list which makes the bulk of one's private file of references suitable for the dustbin.

Overall the book is a most valuable source of information on a topic which has not recently been reviewed elsewhere. Further it has the merit of being of educational value for investigators entering into the cholinergic field.

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Freshwater fish production

Ecology of Freshwater Fish Production. Edited by S. D. Gerking. Pp. 520. (Blackwell Scientific: Oxford, 1978.) £23.50.

In 1966 a symposium on *The Biological Basis of Freshwater Fish Production* was held at Reading University, England, and the proceedings were published by Blackwells in 1967 as a volume carrying the same title. The book was in great demand and has sadly been out of print for some time. However, the overwhelming response to that volume stimulated the production of the present book. The title has been changed and, although it is still recognisable as a 'reprint' of the earlier edition with many of the same authors simply revising and up-dating their previous articles, it does have some new chapters, some new authors and a somewhat different approach. In addition some of the authors appearing in the first edition are absent from this one. Dr Shelby Gerking has been the editor of both volumes and has done a remarkably fine job. The present *Ecology of Freshwater Fish* is a much better work than its predecessor and, as the former was an excellent text, one can appreciate the high opinion the reviewer has of this present edition.

The book is divided into four main areas: vital statistics of fish populations; the fish population and its food supply; competition and social behaviour influencing production; and the contribution of fish production to human nutrition and well-being. The last section is most

welcome, and one worthy of the lengthy treatment it receives this time. It includes contributions on fish yield assessment of large lakes and reservoirs, the growing science of aquaculture, ecological aspects of warmwater fishpond management, and the contribution of freshwater fish to human food, the latter containing a most valuable collection of statistics and up-to-date information.

In the scheme of fish production, information on mortality is required, and one serious omission in this otherwise very complete book is any consideration of mortality from disease, parasitism and predation. Certainly the role of predaceous fish in ecosystems is dealt with in some length, but one would have thought that two papers, one on disease and parasitism, and, one on predation by other animals, would have been a 'must'. There is considerable published work on the effects of disease and predation on both production and yield. Even in the first edition a paper on predation on fish by other animals was included, but for some reason this has been omitted this time.

The book is up to Blackwells usual high quality of production, and only one figure (Fig. 127, p320) is sub-standard. It should be in the library of every university department of biological sciences and on the shelves of freshwater fishery staff. It would also be a useful investment for undergraduate as well as postgraduate fisheries students.

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