

## BOOK REVIEW

**Chemistry and Biochemistry of the Amino Acids:** edited by G. C. BARRETT. Chapman & Hall, 1985. pp. x + 684. £49.50.

This is a major work, and probably the most significant addition to the literature of amino acids since the classic *Chemistry of the Amino Acids* by Greenstein and Winitz was published in 1961. The editor and authors of the present book properly recognize the continuing relevance of the earlier three-volume treatise, and do not attempt to reiterate information presented therein. The book is nevertheless a thorough treatment, particularly of subject areas that have developed rapidly with the application of modern, sensitive and refined analytical techniques. Several newer techniques form the basis of separate chapters within the book: thus separation of amino acids by ion-exchange, and by liquid and gas-liquid chromatographic procedures are reviewed. Physical methods predominant in establishing structures of amino acids are described, and their particular advantages assessed: these include mass spectrometry, nuclear magnetic resonance spectroscopy, optical rotary dispersion and X-ray diffraction crystal-structure analysis.

As the title indicates, the book will have greatest value to chemists and biochemists. The former group are offered up-to-date accounts of developments in synthetic routes to amino acids, of their functional properties, of methods of derivative preparation useful in peptide synthesis, and of optical resolution and racemization. These subjects follow after obligatory chapters cataloguing, and documenting pertinent facts in respect of, the protein amino acids,  $\beta$ - and  $\omega$ -amino acids, and the naturally occurring non-protein amino acids. The book provides what is undoubtedly the fullest listing yet of this last group of amino acids, and well-ordered tables include

almost 700 compounds—an achievement that must have required an exhaustive, and exhausting, literature search. For biochemists (and physiologists), the book provides a lengthy account of amino acid metabolism slanted particularly towards considerations of human nutrition and amino acid turnover, and of disease syndromes associated with aberrant metabolism. Biosynthesis of amino acids forms a separate chapter and is presented by plant biochemists, a situation that reflects the unique anabolic abilities of photosynthetic organisms. Some amino acids, and particularly some examples produced by bacteria or higher plants, antagonize normal processes of amino acid metabolism: the phenomenon of enzyme inhibition by such toxic analogues is related in the next chapter, emphasis being placed on transaminases, decarboxylases, racemases, and enzymes promoting  $\beta$ ,  $\gamma$ -elimination reactions.

The foregoing paragraphs describe the content of the book. The editor personally prepared five of the book's 22 chapters, and some other authors wrote two. The book then achieves a reasonable cohesiveness between topics, but in this respect is more successful in its treatment of the chemical rather than the biochemical subject matter. Although my personal interests could generate bias, I believe the chapter on non-protein amino acids, by including by far the fullest listing ever of these compounds, contributed more to the distinctness of this book than any other section. More generally, it is a book containing much information of value to phytochemists, and even if it is not affordable by all, they should expect to find it in their libraries.

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