

irreversible labels had delayed the isolation and purification of AdR, although some further progress has been made more recently (Lefkowitz, 1976, *Biochim. Biophys. Acta* 247, 1–41). Greater progress had been made, however, in clarifying events following the combination of catecholamine with  $\beta$ -AdR. This was well demonstrated by accounts of the stimulation of adenyl cyclase by catecholamines, the role of membrane phospholipids and guanyl nucleotides (papers by Lefkowitz, by Wollemann and by Will-Shahab et al.) and by accounts of the actions of thyroid hormone and thyroid stimulating hormone on cardiac microsome and thyroid plasma membrane preparations (papers by Will-Shahab et al. and by Marshall et al.).

In contrast the purification of AchR had progressed to the stage at which investigations of the amino acid composition, subunit structure, carbohydrate content, immunological properties and interactions with cholinergic ligands were informative (papers by Heilbronn et al. and by Raftery et al.). However, information about the mechanisms underlying membrane events following the combination of acetylcholine with the receptor, was minimal. An

account of the reconstitution of chemically excitable vesicles from purified AchR and native phospholipids (paper by Raftery et al.) illustrated a recent, promising approach. Since the Symposium, further accounts of this kind, some cautionary, have indeed appeared.

Although interesting and, in the main, well produced, this volume shares the difficulty common to most published accounts of specialised symposia, particularly on rapidly developing subjects. Of necessity, they represent limited samplings of current research in the specified areas, the greater part of which has usually reached the scientific literature before the symposia are published. It may be thought, therefore, that books of this kind are not comprehensive enough for the student, while they contain material already familiar to the specialist. Several books and reviews have appeared in the past 2–3 years, containing articles by other contributors to the area of research covered by this particular volume. Work on AchR has been particularly well represented.

A. K. Prince

### *Mass Spectrometry of Steroids*

by Z. V. Zaretskii

John Wiley and Sons; New York, Toronto. Israel University Press; Jerusalem, 1976

xi + 182 pages. £ 9.90, \$ 19.80

First reports of the application of mass spectrometry to the structural elucidation of steroids were made in the mid-1950s and since that time these compounds have been extensively investigated. The present book sets out to summarize and review electron impact induced reactions of the principal steroid structures. The six chapters include steroid hydrocarbons, ketones, alcohols and olefins together with bile acids and oestrogens. Covering a range of steroid structures in a short book (182 pages) has necessitated brief discussion of the spectra of individual compounds and limited the treatment to selecting the most cha-

racteristic fragmentations induced by particular functional elements. The author has succeeded in presenting this data succinctly and in a style which is easily read. Figures and fragmentation schemes are well laid out.

The obvious importance of stereochemistry in steroid molecules and the need to differentiate configurational isomers is reflected in the emphasis placed on the effect of stereochemistry on fragmentation and rearrangement processes in the chapters on ketones, alcohols and oestrogens. The authors have also drawn together data on the relationship of ion

appearance potentials, ion intensities and the stereochemistry of ring fusion. Ions arising from simple cleavage of bonds at ring junctions normally have lower appearance potentials and higher intensities in the more labile stereoisomer. On the other hand, ions formed by rearrangement processes depend more directly on the atomic distances between interacting centres and less on the energy differences between isomers.

Although mention is made of acetate derivatives and the methyl ethers of oestrogens and methyl esters of bile acids, reference to other derivatives has been avoided. This is an unfortunate omission, particularly for hydroxylated steroids where, for example, the use of trimethylsilyl derivatives, is very widespread. The latter have proved of value from the point of view of volatility for gas chromatographic separation and

mass spectrometric introduction and as a means of directing fragmentation in the molecule. They are used extensively in characterising steroids from biological material and their exclusion underlines a lack in the book of comprehensive coverage of more highly polyfunctional compounds isolated from such sources.

This text is written primarily from a mass spectrometry mechanistic standpoint with supporting references from original papers, nevertheless, it will not overpower the reader who wishes simply to derive information about ions which arise from different structures and stereochemistries. This should be very useful to those interested in extrapolating the decomposition pathways discussed to their own studies of steroids.

A. M. Lawson

### *Molecular Endocrinology of the Steroid Hormones*

by D. Schulster, S. Burstein and B. A. Cooke

John Wiley and Sons; London, 1976

xv + 321 pages. £ 9.75, \$ 20.00 (cloth); £ 4.75, \$ 10.00 (paper)

During the last 10–15 years, knowledge of the general biochemical mechanisms of hormone action has increased dramatically and the investigation of steroid hormone effects contributed much of the early impetus in this field. The stage has now been reached when conclusions are no longer too speculative to present in textbook form. However, to understand current ideas, some grasp of the principles of the chemistry, biochemistry and technology of steroid hormones and their trophins is essential. The great value of this book is that before embarking on an exposition of the authors' subject such a background is provided.

The book is divided into four sections, two of which are of an introductory nature. The first covers steroid structure and nomenclature, techniques for steroid analysis and for investigation of steroid biosynthesis and secretion, and finally pathways of biosynthesis. To cover such a field in approximately

70 pages allows no more than a superficial treatment but a series of well-selected references are given at the end of each chapter. There are two minor inconveniences in this section. Firstly, all the examples of steroid derivatives are tucked away in an appendix rather than included in the appropriate section. Secondly, the conventional representation of the  $\alpha$ -bond is in some diagrams so poorly printed that only at a second glance can it be distinguished from a  $\beta$ -link. In other respects the illustrations are very clear.

The second preparatory section deals with the structure and function of the endocrine glands themselves. After a chapter on the hypothalamus and pituitary, consecutive chapters deal with the adrenal cortex, ovary, testis and foetoplacental unit. The section is completed by a description of steroid metabolism by the liver and kidney since this is important in the control of circulating steroid con-