of Reichstein which indicated that the adrenal compounds had a sterol ring structure. The contribution of Dwight J. Ingle is emphasized in this book, because Ingle developed a test for the biological activity of the corticosteroids which did not involve changes in electrolyte metabolism, but rather variations in muscle work response. It is of great interest that in the beginning most adrenal physiologists felt that a single hormone possessed all of the observed activities such as sodium conservation and potassium loss and life maintenance. It became slowly and painfully clear to Kendall and others that a single hormone could not account for all of these activities. Had not some assessment other than of the electrolyte activities of the compound been made, it is possible that cortisone and the glucocorticoids would have been overlooked as important biological substances. The story makes good reading.

Edward C. Kendall possessed an intense desire to create something useful, that had application. He is a strong advocate of goal-directed research. His story is one of great motivation as he labored successfully to his goals.

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Nitrogen

The Analytical Chemistry of Nitrogen and Its Compounds. C A. STREULI and P. R. AVERELL, Eds. Wiley-Interscience, New York, 1971. In two parts. xvi, 764 pp., illus. $35. Chemical Analysis, vol. 28.

The fact that this book is volume 28 of a series of monographs on analytical chemistry and its applications may give the impression that it is somewhat encyclopedic in character. This is a correct impression. An excellent coverage of the analytical chemistry of nitrogen and its compounds is to be found here. The volume is a valuable source of information on almost any aspect of nitrogen analysis, and should be useful to chemists and scientists in related areas. With the exception of alkaloids, which have been deliberately omitted because they "are covered thoroughly in other publications," only a few of the more exotic types of nitrogen compounds (for example, nitrile oxides and *N*-sulfinylamines) are missing. Each chapter contains sections on the general chemistry, the qualitative detection, and the quantitative determination of the class of compounds under discussion. The general chemistry discussion is valuable in that it permits the analyst to approach his own particular problem in an intelligent manner. The methods described range from classical wet methods to modern instrumental techniques (for example, there is a chapter on the nuclear magnetic resonance of nitrogen). The inclusion of older noninstrumental methods is of value to people who do only an occasional analysis or who do not have access to expensive instruments. The specific directions given for some of the analytical methods are often too brief to be useful to anyone but an expert, but they do serve the purpose of giving the reader a better idea of the method. It would be well for the reader to consult the original literature after using the volume as a guide to the available methods.

Many chapters, such as the one on amino acids, polypeptides, and proteins, contain valuable critical discussion concerning the relative merits and weaknesses of the methods described. The chapter on inorganic nitrogen compounds of sulfur and phosphorus has a valuable tabulation of those compounds. This chapter is also to be commended for its discussion of the safety precautions to be taken in handling them. The chapter on synthetic polymers constitutes a brief course in practical polymer chemistry.

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Chromatographies

Modern Practice of Liquid Chromatography. J. J. KIRKLAND, Ed. Wiley Interscience, New York, 1971. xxii, 454 pp., illus. $14.95.

This book unifies, both in theory and methodology, the historically separated ion exchange, adsorption, liquid partition, and gel permeation chromatographies. The initial chapter, by Karger, sets the theme in terms of the modern concepts of plate heights, resolution, the van Deemter equation, and optimized performance. The remainder of the book follows as a logical application of these principles. Henry's chapter deals with the equipment needed to accomplish the theoretical goals and takes the reader step by step from the mobile phase source to the detector in such a manner that he should be able to evaluate commercial equipment or assemble his own. Byrne treats the detector problem with equal nicety. The prayer for a general detector has never been wholly answered in liquid chromatography, and determining the detector appropriate to the problem requires much attention. In liquid chromatography the number of stationary phases is small, and solute separation is largely a problem of choosing the appropriate mobile phase. This problem is attacked by Snyder, who attempts a logical approach which will, we may hope, avoid the capricious selection of mobile phases and circumvent the empiricism that clogged the early literature with a multitude of developers and complex combinations of them. Snyder points out that the suitable separation of multicomponent mixtures of solutes of widely different selectivities must be accomplished by changing the mobile-phase composition (gradient elution) during the chromatography. This point feeds back to the chapters on equipment and detectors.

Part 2 takes the reader into modifications required by more specific techniques. Kirkland deals with liquid-liquid methods. This chapter is most welcome because the information it summarizes is scattered throughout the literature; the reviewer is unaware of any other collective review on this subject. Snyder deals with liquid-solid separations, Bombaugh with gel permeation, and C. D. Scott with ion exchange. Halász follows with a short overview.

Part 3, which deals with specific applications and results, is not as well organized and "tight" as the preceding sections. Bombaugh compares separation mechanisms, Schmit treats controlled surface porosity supports, and Gere deals with nucleic acid constituents. We'd all like to see more varied data to support the contentions of the first two parts.

The book is photocopied from typed pages with an unjustified right margin. There are few errors. Kirkland has supplied us with an urgently needed modern treatment of this subject. The book must be on the shelf of anyone doing or teaching separations. We thank Kirkland for the appropriate dedication to Steve dal Nogare.

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