

translators and the English editor are to be congratulated on producing a final work which scarcely ever reveals that English is not the original language of composition. The whole is a most scholarly and satisfying work, rigorous and yet imaginative in its analytical treatment of aerosol behaviour. Unlike some highly specialized technical works, this book is eminently readable. It is logical in presentation and full of incisive and perceptive comment on where future investigations might be directed.

The somewhat long delay in producing this English edition is presumably due to the complicated checking procedure adopted to ensure a rigorous translation. A good deal of work has naturally been published in this field since 1960, and in some topics, therefore, experimental data discussed are already incomplete. For example, the assessment of atmospheric dispersion using Pasquill's treatment, published in 1961, has been shown to be more accurate over long distances than Sutton's formulae. Its use is preferred, for example, in most present-day reactor safety calculations. Furthermore, some previous work was reported in sources not available to the author. A future edition might include an analysis of the global atmospheric dispersion of aerosols together with a collation of those topics which have sufficient relevance to radioactive wastes.

There are, however, no major omissions in the subject dealt with, while the general treatment is so authoritative and rigorous as to guarantee this book as a standard reference work of lasting value. It will be of unquestionable worth to research workers in university, industrial and relevant applied research departments.

J. F. CROFT

MASS SPECTROMETRY IN NATURAL PRODUCT CHEMISTRY

Structure Elucidation of Natural Products by Mass Spectrometry

By Dr. Herbert Budzikiewicz, Dr. Carl Djerassi and Dr. Dudley Williams. Vol. 1: Alkaloids. (Holden-Day Series in Physical Techniques in Chemistry.) Pp. xi + 233. (San Francisco and London: Holden-Day, Inc., 1964.) 10.50 dollars.

THE most striking development in post-War organic chemistry has been the intensive application of physical methods to the elucidation of molecular structure. The various spectroscopic techniques, ultra-violet, infrared and nuclear magnetic resonance, can all give important information very quickly; X-ray crystal analysis still remains the ultimate and final arbiter of molecular architecture, but it is unfortunately very time-consuming. Now another physical weapon has been added to the armoury of the chemist, high resolution mass-spectrometry, and, although this technique has been in general use only since 1960, the results achieved have been spectacular.

In Volume 1 of *Structure Elucidation of Natural Products by Mass Spectrometry*, the three authors—all pioneers in this field—confine their attention to alkaloids. This group of natural products presents a very favourable situation for the interpretation of cracking-patterns, since the first effect of electron impact is to remove an electron from the basic nitrogen atom leaving an ion-radical, the following homolytic fragmentation of which can usually be fairly easily predicted. Examples of various types of fragmentation are given, with particular reference to the various groups of indole alkaloids. Indeed, it is in this particular field that mass spectrometry has scored some of its most striking successes—complete structure determination of very complex molecules using only a few milligrams of material and with an absolute minimal recourse to 'chemical' operations. Among other alkaloids discussed

are the isoquinoline, emetine, colchicine, lycopodium and quinazolone groups.

This is an admirable book which every practising organic chemist concerned with natural products will need to read: the immense power of the techniques described is fast changing the whole face of the subject. A further work, covering steroids and terpenoids, is promised shortly. At the end of their preface, the authors thank their publisher "for sharing our feeling that, if newspapers can be produced from one day to the next, books—which are generally shorter than the Sunday Edition of the New York Times—need not take more than ninety days". Other publishers of similar urgently awaited material, please note.

J. HARLEY-MASON

EXPANDING HORIZONS IN PHARMACY

Advances in Pharmaceutical Sciences

Vol. 1. Edited by H. S. Bean, A. H. Beckett and J. E. Carless. Pp. xi + 334. (London: Academic Press, Inc. (London), Ltd.; New York: Academic Press, Inc., 1964.) 75s.

THE aim of this new series is to concentrate on areas of specific interest to the pharmacist . . . For the uninitiated, pharmacist and pharmacist are synonymous in the Pharmacy Acts. Further, "The articles will be an appraisal of a subject rather than a mere factual abstraction of the literature".

The aims are praiseworthy, and although the four subjects chosen for this volume are of wide interest, the authors have included pharmaceutical applications.

The chapter on rheology is well written and is aimed at the undergraduate level. The theoretical section is brief, and the simpler concepts are dealt with in an explicit manner. The section on instruments is mainly descriptive and may be improved by a greater appraisal of the limitations and use of the instruments described.

The review is most concerned with solid/liquid and liquid/liquid systems, so that the perfunctory treatment of powders and the omission of the compression of powders is understandable. The systems and processes in which rheological properties are important are listed and should be useful in directing the attention of a pharmacist to the need for extensive work. This last section is good, but the factors affecting the viscosity of suspensions should also be included under emulsions, with the exception of the 'shape factor'. The use of Stokes's equation, which does not include a volume fraction term, for describing the rate of creaming of an emulsion is best avoided as the impression remains that the viscosity of the continuous phase, rather than that of the system, is important.

The first three sections of "Solubility in Systems Containing Surface Active Agents" gives a good review of the relevant ideas on micelle formation and solubilization. The last two sections, too, are very well done and contain an admirable summary of published information which is probably of greater value to the postgraduate worker.

Unfortunately, in the section on phase equilibria, the systems are not adequately described, most of the phase diagrams included are not even mentioned in the text, and the symbols used are not consistent in all the diagrams. If this section could be improved to the level of the rest of the chapter it would be a valuable summary for pharmacy students.

Mrs. Wedderburn has produced a very carefully written appraisal of a difficult subject in the chapter on "Preservation of Emulsions against Microbial Attack". It was enjoyable to read and easy to understand, since the problems involved were well discussed. Apart from those for internal use, the difference between cosmetic and pharmaceutical emulsions is one of degree, since cosmetics