

sets it in perspective. It is a book which has long been required and is a completely reliable and knowledgeable description of research work up to the beginning of the Second World War which will remain a uniquely valuable work of reference.

The translation is always adequate though there are a few 'Germanisms', and the book has been very well produced. Inevitably the price is high, but it is likely to be bought by many paediatricians who until now have had difficulty in finding descriptions of early work on behaviour development.

T. T. S. INGRAM

PAPER CHROMATOGRAPHY

Paper Chromatography

A Comprehensive Treatise. Vol. 1, Edited by I. M. Hais and K. Macek. Pp. 955 (1963), 190s. Bibliography of Paper Chromatography, 1944-1956, and Survey of Applications, Vol. 2. By Karel Macek and I. M. Hais. Pp. 766 (1960), 171s. 6d. Bibliography of Paper Chromatography, 1957-1960, and Survey of Applications, Vol. 3. By Karel Macek, I. M. Hais, J. Gasparič, Jan Kopecky and V. Rábek. Pp. 706 (1962), 171s. 6d. (Prague: Publishing House of the Czechoslovak Academy of Sciences; New York and London: Academic Press.)

THIS work has had a rather complicated history. The first edition was published in the Czechoslovakian language in 1954 and was rightly regarded as the most complete treatise on paper chromatography to be written. The second edition was published in German only four years later, and some time afterwards the Czech version appeared, to be followed by Romanian and Russian translations. The second edition consisted of two volumes: Volume 1 covered principles and applications; Volume 2 was bibliographical, covering the literature from 1944 to 1956. The third edition comprises three volumes. Volume 1 has been brought up to date; Volume 2 is unaltered from the second edition, and Volume 3 has been added to supply bibliography for the years 1957-60. Volumes 1 and 3 are translated into English, but Volume 2 is in Czechoslovakian, although it must have been the intention of the editors to prepare an English translation. There is a separate supplement in English to help the English reader to find his way about this volume.

In both bibliographical volumes, the titles of references are given in their original languages, if in French, German or English—as more than 90 per cent of them are—otherwise they are translated into English. Volume 3 follows the arrangement of Volume 2, the German version of which was reviewed in *Nature* five years ago (184, 1436; 1959), but the editors have been more selective, omitting thin-layer and column chromatography and references in which paper chromatography has not played an important part. Yet the number of references (more than 8,000) for the years 1957-60 compared with some 10,000 for 1944-56 shows that, despite the development of other techniques, paper chromatography continues to hold its own as an analytical tool.

In Volume 1, much of the material of the previous edition has been incorporated unchanged, but there has been some re-arrangement of subject-matter and most of the chapters have been brought up to date. There is a good deal of new material on radioactive substances, peroxides and peroxi-acids, steroid glycosides, terpenes, pesticides, pigments, plastics and intermediates and inorganic substances. The practical notes on detection reagents, solvent systems and quantitation have been usefully extended. Special attention is directed to the relationship between chromatographic behaviour and chemical structure and to the elaboration of solvent systems for the identification of substances on the basis of their chromatographic mobility.

In this volume also, the editors have been more selective than in previous editions. Column chromatography on cellulose derivatives, and electrophoresis, have been omitted, but further pruning would have been desirable, particularly of obsolete material such as the sections on retention analysis, on preparative paper chromatography and on the paper chromatography of proteins. On the other hand, there are a few omissions; for example, the part played by paper chromatography in the discovery of iduronic acid in chondroitin sulphate *B* is not mentioned and the importance of the 'finger print' technique for peptides is not emphasized. The latter is deliberately played down because it involves electrophoresis, yet a fuller account (with photograph) is given of the separation by this means of the amino-acids of blood serum—surely a less important application.

These are, however, comparatively minor criticisms of a work which covers an enormous field with great thoroughness. The English translation is on the whole well done, but the quality of the paper leaves much to be desired. This makes the reproductions of photographs in Volume 1 poor by comparison with the German version, which was printed on good paper. The high price of these volumes will deter many individual prospective buyers, but should not prevent libraries from adding these useful reference books to their shelves.

R. CONSDEN

MATERIALS AT EXTREME CONDITIONS

High Temperature Structures and Materials

Proceedings of the Third Symposium on Naval Structural Mechanics, held at Columbia University, New York, N.Y., January 23-25, 1963. Edited by A. M. Freudenthal, B. A. Boley and H. Liebowitz. (Office of Naval Research Structural Mechanics Series.) Pp. xv + 463. (London and New York: Pergamon Press, 1964.) 100s. net.

THIS collection of thirteen papers was designed to cover four broad subjects: material aspects of elevated temperature design; effects of high-speed environment; thermal stress analysis; design criteria and reliability. As is stated in the preface: "It was hoped that the collaboration in one conference of material physicists, mechanicians, and structural designers concerned with the problem of elevated temperature effects on the performance and safety of modern structures would at least in part bridge the gaps existing between the three groups". This is a worthy aim, and no doubt much was gained by those who participated in the conference. As a published work, however, the papers cannot be said to carry the bridge-building spirit very far: many of them are fairly specialist reviews, not tailored for general communication (this is particularly true of the more mathematical ones on thermal stresses, and on the thermoelastic boundary problems), while others, good in themselves as technical assessments, fail to carry the arguments to the point where the real nature of the critical problems may be appreciated and discussed in non-specialist terms. Unfortunately it is much harder to write a paper on the lines necessary for a truly interdisciplinary conference than it is to prepare one of the more standard form, as many who have experienced such meetings will know.

Taking the contributions out of this context, one must acknowledge the quality of many of them. The range of subject-matter covered is too wide to be of universal interest for the average reader: it extends from Mason's treatment of the elastic and anelastic properties of solids, involving, for example, discussions on semi-conductor physics, to the crystal mechanics inherent in the paper on creep by Dorn and Mote, and from the applied mechanics approach to thermal fatigue, as exemplified by