

will eventually comprise five volumes, each in several parts. Each chapter has been written by a different author and is essentially complete in itself. The topics covered are: Chapter 1. Styrene-butadiene latices, 2. Starch polymers, 3. Cellulose esters and ethers, 4. Drying oils, 5. Paint and painting in art, 6. Rosins, 7. Urea and melamine resins, 8. Vinyl resins and 9. Vinyl emulsions. The treatment given by the different authors varies very considerably. All of the chapters contain the technology of the particular binder under discussion but beyond this the treatment is far from uniform. Some chapters discuss pigmentation and give paint formulations while others omit this discussion entirely. The theory, when included, is cast at a rather low level and unfortunately is repeated somewhat in chapters dealing with similar topics, for example emulsions. A critical comparison of related topics would have been desirable, for example a comparison of styrene-butadiene, acrylic and vinylacetate emulsions would have been welcome. The authors are largely North American and naturally write from the North American viewpoint referring to North American raw materials. There are, however, two chapters by British authors which helps to provide some balance from the point of view of a reader on the east side of the Atlantic.

In spite of these shortcomings, judging from the parts I and II, this treatise will be very useful for reference. The libraries of most paint companies will wish to purchase it.

N. B. GRAHAM

Symposium on Fibrous Proteins. Australia 1967

Edited by W. G. CREWTER. Butterworths (Australia): Sydney, 1968. 7 in. + 9½ in. 432 pp. 200s

THE book is a collection of papers presented at the Symposium on Fibrous Proteins held in Canberra, Australia, in August 1967. It covers a wide selection of topics subdivided into the following sections: I. Relation between amino-acid composition, and conformation of polypeptides and proteins; II. Muscle and flagella; III. Collagen and elastin; and IV. Keratin.

As is usual with a collection of papers from an international meeting, both the quality and information content vary widely. In some contributions the amount of new information conveyed is negligible because all has already been revealed on more than one previous occasion. Consequently the value of the book must be judged on whether the collection of data presented is both useful and accessible. Undoubtedly there are very interesting and informative contributions to this volume. In Section I there is a valuable general article by ARNOTT which describes a procedure for optimizing the conformations and positions of molecules in crystals. The method has particular application to establishing the conformations of linear biopolymer systems (polypeptides and polynucleotides) for which the X-ray diffraction data are of poor quality and low resolution. Other main topics covered are the structure of lysozyme (NORTH), the stability of α -helices in proteins and polypeptides (FRASER *et al.*), hydrogen bonding and the conformation of polypeptides (RAMACHANDRAN *et al.*), the structure of silk fibroins (LUCAS *et al.*) and theoretical considerations of the conformations of polypeptide chains (LIQUORI). In the last article the computed conformation of gramicidin-S is presented again and since this differs from the prediction of another theoretical group, the experimental determination of the structure of this molecule is awaited with great interest.

In Section II the application of ELLIOTT's toroidal X-ray camera is beautifully demonstrated by the diffraction patterns shown by CHAMPNESS and LOWEY from bacterial flagella and by ELLIOTT from paramyosin. The conformations of both of these systems are discussed and a model is proposed for *Salmonella flagellum*. SUSAN LOWEY describes the enzymic degradation of myosin and a physical study of the resulting subunits. Other articles in this section are concerned with the biosynthesis of flagellin, the structure and denaturation of tropomyosin B and studies of interactions of subunits of myosin, myosin with actin and other small molecules with muscle proteins.

The section on collagen and elastin contains eight papers on the physical chemistry, biosynthesis and chemistry of collagen systems and two on elastin, while the last section on keratin, the largest in the book, reflects the general interest of Australians in wool. It

contains nineteen articles ranging from 'Is α -keratin a coiled coil?' to 'The dietary regulation of the synthesis of hair keratin'.

Although the data collected together in this volume are not of general use to protein chemists, they are likely to be of value to those who are involved in studies of fibrous proteins, particularly keratin. Unfortunately the data are not very accessible, there is no index and one has to thumb through the pages to find out what is included. This criticism, however, can be made of most collections of contributions to large meetings.

E. M. BRADBURY

Macromolecular Chemistry—4

International Symposium on Macromolecular Chemistry Brussels—Louvain Belgium 12-16th June 1967. Plenary and Main Lectures. Butterworths: London, 1969. 6 in. \times 9 $\frac{3}{4}$ in. pp 201-490 + *i-xxvi*. 90s

THIS book brings together the important lectures given at the IUPAC symposium in June 1967. Superficially, the collection of subjects given appears to lack coherence, for example 'Synthetic polymers in medical science' by H. F. MARK, and 'Thermodynamics of membrane transport' by A. KATCHALSKY, together represent a breadth of interest which few polymer scientists aspire to. On reading the book in detail, however, one finds that the collection has the merit of giving a general picture of some of the more important developments currently taking place in the polymer field.

C. S. MARVEL has presented an interesting summary of the published literature on 'Thermally stable polymers'. His main conclusion is that ladder structures offer the promise of fabricatable polymers with good oxidative and thermal stability. As with most accounts of this kind nothing is said about the cost of these systems and fabricatability is not defined. Thermally stable polymers is now a mature subject but its future depends on solving the chemical problem of synthesis in terms of economics and fabricatability as well as thermal stability. C. E. H. BAWN discusses recent developments in the use of ionic initiating systems, derived from neutral molecules and vinyl monomers by electron transfer processes. Polymerization appears to proceed through complexes which are mixtures of radical cations. Of particular interest is some new work by S. OKAMURA and his colleagues on the cationic polymerization of α , β disubstituted olefins. Crystalline substituted poly(propenyl ethers) are obtained from *cis* and *trans* forms of these monomers.

Studies in polymer structure are well represented and include a chapter by F. A. BOVEY on the use of n.m.r. and optical studies for the elucidation of the conformations of polypeptide chains. This review also summarizes the present position of the mechanism on the helix-coil transition. Also of interest is the use of perdeuteropolyethylene in the study of chain folding in polyethylene using infra-red spectroscopy by S. KRIMM. At the supermolecular level V. A. KARGIN discusses the morphology of crystalline polymers in a very general way. Many of the electron micrographs shown are familiar, however; for example, those of necked polyethylene and partially brominated gutta-percha appeared in other review articles.

Finally, the last main section represented concerns reactions of polymers. It includes studies of the hydrolysis of poly(vinyl esters) by S. SAKURADA; a more general chapter by R. C. SHULZE discusses hydrolysis of polyanhydrides, asymmetric synthesis, isomerization of macromolecules among other things and an essay on the use of e.s.r. in polymer degradation studies by N. GRASSIE completes this survey.

D. G. H. BALLARD