on tire yarns and cords and with very educational chapters on the x-ray investigation of cellulose and on other physical fiber analysis. There follows in Part V the detailed description of the single processing steps as they are carried out in viscose rayon plants and as Part VI a comprehensive and complete survey on existing chemical, mechanical, and other physical test methods.

Each contribution is provided by an outstanding authority in the particular area, yet Dr. Götze has succeeded in molding all these individual chapters in a unified pattern which is complete but still manageable and highly educational. No other fiber field, natural or man-made, possesses an equally impressive cross-section through all phases of its activities.

The two volumes are true "Springer Books"—excellently printed, organized and very attractively made up. The "Götze" is indispensable for anyone who is interested not only in cellulosics but in textiles in general, and every user will draw great profit and much pleasure from its use.

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Non-Newtonian Flow and Heat Transfer. A. H. P. SKELLAND. Wiley, New York, 1966. xvi + 469 pp. $17.95.

From an empirical science, polymer chemistry has grown to a 13 billion pounds industry. Much has been published on the configuration, polymerization kinetics, and reactions of polymers, as well as on the fabrication of plastics by molding, extrusion, and calendering. But little has been known on the design and engineering of polymerization and polycondensation plants. Scaling-up reactors, heat exchangers, pumps, and piping had been done mostly empirically, based on a few simple factors received from equipment manufacturers. The need existed for an engineering book on the flow, agitation, and heat transfer of highly viscous polymeric melts, solutions, emulsions, and suspensions. This gap has been filled by the outstanding textbook of A. H. P. Skelland.

His book has been written especially for chemical engineers working in the polymer industry and responsible for the design of new polymer plants and optimizing existing equipment. It is also an excellent book for students and polymer chemists who want to learn and familiarize themselves with the problems of time-independent non-Newton fluids, thixotropic and rheopectic fluids. This had been an area which had not yet been treated from an engineering design viewpoint. It is shown that pumps for thixotropic fluids, for example, must be sized according to the energy required during the initial pumping period.

Laminar, transitional, and turbulent flow are discussed extensively relating boundary layer theory, mixing, agitation, and heat transfer. The high viscosity of most polymers causes laminar flow more frequently than for monomer or other chemicals of low consistency. Fluids with and without yield stress are dealt with in separate chapters. The turbulent boundary layers are analyzed employing the von Karman integral method.

Production and process engineers in the polymer industry will value this text as a handbook for calculating cost reduction and improved operation. For example, how to estimate optimum pipe diameter or optimum pumping temperature is indicated. Mixing and shear agitation are dealt with.

The selected problems and summaries given at the end of each polymer will help all of us to acquaint ourselves more with the behavior and flow of polymeric fluids through pipes, tubular reactors, heat exchangers, and in agitated kettles. The numerous un-

solved examples will stimulate the reader to work the answers by himself and will help him to formulate and solve his own specific problem. Attention has also been given to viscoelastic fluids.

This book is recommended as a must to all chemical engineering departments of the polymer industry and to all who want to acquaint themselves with the problems of designing polymerization and polycondensation units.

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Rubber: Natural and Synthetic. H. J. STERN. Maclaren and Sons Ltd., London. Palmerton Publishing Co., Inc., New York. 519 pp. $16.00.

Before writing this, I read three reviews, published elsewhere, of this book. Two of the three seemed to be pieces of hackwork put together by journalists who had not actually read the book but relied on the author's preface and the publisher's jacket to provide them with a few paragraphs, neither informative nor critical. The third and longer review was written by a man who, clearly, had read the book and was versed in its subject matter, but who seemed to be chiefly concerned with displaying his own superior knowledge. It was devoted mostly to persnickety criticisms of the book. How often one encounters reviews of these types: either superficial and perfunctory hackwork, turned out with minimal effort and unfair to both author and reader; or supercritical treatment, designed to advertise the reviewer's superior knowledge rather than to assess the book fairly for its prospective readers and to offer a judgment of the success of its author's enterprise!

I use the word "enterprise" advisedly. Except for encyclopedic publications, every scientific and technical book demands from its author enterprise in selecting, ordering, and explaining that information which will best serve his purpose. I ask then, what success has the author of the present book had in his particular enterprise? Remarkable success, I say. Dr. Stern's book is certainly open to criticism on points of detail here and there (What scientific or technical book is not?), but, considered as a whole, it is remarkably successful; indeed, it is a *tour de force.*

The 1937 book, *The Chemistry and Technology of Rubber,* edited by Davis and Blake, was, except for a short (and not very good) chapter on synthetic rubber, devoted to natural rubber. It ran to about 1000 pages. The 1954 book, *Synthetic Rubber,* ran to more than 1000 pages. Dr. Stern's book, *Rubber: Natural and Synthetic,* runs to only about 500 pages, yet within this compass it gives a good, up-to-date account of the production and use of both natural and synthetic rubber.

The book is essentially one for the technologist (who, in the case of rubber, is almost inevitably a chemist). It includes a brief treatment of the scientific aspects of rubber, thus providing some understanding of the theory of rubber directly relevant to its technology. The book is not one designed primarily for the research worker. Nevertheless the latter will find a perusal of it beneficial, for its story of rubber technology is up-to-date and may well stimulate new research approaches.

In preparing this new second edition of a book first published in 1954, the author, in view of rapid progress in the field, has drastically revised it. In no other book is there such an up-to-date and conveniently available account of the whole range of synthetic rubbers now produced. Possessors of the volume, *Introduction to Rubber Technology,*