

REVIEWS

Synthetic Rubber from Alcohol. By A. Talalay and M. Magat. (Interscience Publishers, Inc., New York, U.S.A.), 1945. Pp. 298. Price \$5.00.

This book is a publication on a subject of topical interest. The Russian Planners with great foresight encouraged and financed investigations by their scientists on the production of synthetic rubber from alcohol in anticipation of a war which might cut them off from the sources of natural rubber. The book is a story which tells us how the Russian scientists rose to the occasion. Not only were synthetic rubber plants functioning successfully in Russia when Germany declared war against her; but she was able to render material assistance to U.S.A. when Japan got possession of the natural rubber resources of the East Indies. The authors have rendered a service to the English-speaking scientific world by presenting in a book form the valuable work which had remained inaccessible in Russian literature.

This technical process centres round the well-known discovery of Lebedov that a combination of a dehydrating and dehydrogenating catalyst can give butadiene, in considerable yield, from alcohol. The catalyst and technology have been continuously improved with the result that the yield of butadiene increased from 22 per cent. in 1934 to 41 per cent. (or 70 per cent. of theoretical) in December 1939. Unfortunately the method of preparation of the catalyst has not been revealed; and one has got to remain content with the observation that it is a combination of two materials A and B which may be zinc oxide or aluminium oxide or manganese oxide, etc. The technology of the process, however, has been described in considerable detail. The Emulsion method of polymerising butadiene into synthetic rubber is practised in Germany and other countries but not in Russia; and here valuable information has been given as to how emulsion polymerisation should be done. In Russia, the polymerisation or rather to be accurate, polycondensation of butadiene into rubber is carried out, with the aid of a finely dispersed sodium catalyst "mostly spread thinly over metal shelves or trays".

Besides this Russian work, the book gives general information on the physico-chemical properties of butadiene polymers, e.g., their chemical constitution and molecular weights, X-ray structure and mechanical properties, plasticity, gel formation, oxidation, heat-hardening, viscosity, etc. The treatment of the subject is well balanced—theory and practice—each receiving due share of attention.

It is not surprising that some vital information relating to the production of synthetic rubber from alcohol should have been withheld in war-time for reasons of security, but it is surprising to note that Russian scientists

take out patents not only in countries outside Russia but also in their own.

J. C. G.

An Outline of Industrial Metallurgy. By D. G. P. Paterson and J. Bearn. (Chapman and Hall, Ltd., London, W.C. 2), 1944. Pp. 185. Price 12s. 6d.

A publication of this kind is of great assistance to non-specialists interested in the manufacture of metals, and also to a Research worker on the latest developments of iron and steel and other important non-ferrous metals. It deals with all aspects of metal working commencing from the smelting of the ore down to the final finishing of all products. Perhaps, another chapter describing details of smelting of iron, steel and more prominent of non-ferrous alloys would have added to the value of the book. When it is remembered that the various processes involved in different stages are exceedingly complicated, the reader will appreciate the procedure adopted by the authors, helping him to have a clear understanding of the subjects.

As metal working requires the use of high temperatures, the importance given to the scientific measurement of temperatures is correctly emphasized. The principal features of smelting and shaping of the metals and alloys are very clearly, though briefly, dealt with. The physical and chemical properties attained by the metals as a result of various treatments are discussed in great detail and should prove immensely useful to all research students and non-technical readers. Methods of thorough examination of the metals and alloys under microscope and X-ray, have been described clearly and the Research worker finds ample hints and notes on the procedure to be followed. Interpretation of the results so achieved, and means of locating and determining the extent of defects in the metallic materials are exhaustively treated.

In these days when the metals are required to satisfy very rigid specifications, and to prove their worth for complete freedom from risk and uncertainty, chapters dealing with this aspect will undoubtedly prove very valuable.

During the last twenty years and especially during the war years, the great importance emphasised on the heat treatment of the metals and alloys is brought out very clearly, and details of different methods of heat treatment for certain types of alloys are set forth. Chapter on Industrial Heat treatment and the subsequent chapters describing among others, latest methods of normalising, bright annealing by cracked ammonia process, hardening and tempering of special alloy steels, nitriding, etc., contain valuable information useful to all engaged on the manufacture of alloy steels.

Till recently one of the chief drawbacks in the larger use of some of these highly specialised alloys was the difficulty in handling them and machining them. These difficulties are being overcome by giving them a special treatment prior to machining, and by the use of special cutting tools—a development of far-reaching importance to Engineering Industries.

Special detailed treatment of aluminium alloys and stainless steels dealt with in two chapters indicates the importance these alloys are playing in the modern-day high class engineering practice. Means of improving the qualities of metals, normally possessing ordinary qualities, have also been dealt with.

The question of repairs to the broken or damaged parts of metals has not escaped the attention of the authors. The different practices such as soldering, gas welding, electric welding have been treated in a very clear manner. Improvement in the technique of electric welding and the development of induction and other means of hardening of parts liable to wear have been clearly described.

Finally, the action of various agents in corroding, thereby shortening the lives of metals is referred to. Some methods of protecting them against corrosion may be traced back to the days when metal began to be used. Remedies have been suggested and adopted from time to time and many of them have limitations. The urge for utilising all the natural resources in the world to the best advantage and the anxiety that the metallic resources will soon get depleted if the present increased rate of consumption continues have led to intensive research on methods of preventing corrosion, and this aspect has been very exhaustively dealt with and the various protecting agents and methods of applying them are described in detail.

Numerous illustrations, diagrams, micro-photographs, etc., greatly enhance the usefulness of this publication.

D. V. KRISHNA RAO.

You and Your Radio. By Vepa V. Lakshmana Rao. (Addison & Co., Ltd., Madras), 1945. Second Edition (Revised). Pp. 170. Price Rs. 5.

A book for the relatively non-serious students of Radio, who do not care to delve very deep but wish to be entertained and lightly instructed while operating their Receiving sets, has long been needed. *You and Your Radio* by Vepa V. Lakshmana Rao which covers the entire story, fills a distinct want in this direction.

The author has divided the book into twenty-three chapters. Beginning with fundamental lessons and carrying through the Broadcast chain, he follows it up with simple and easily understood explanations of the Radio receiver and its allies. Besides discussions and pictures illustrating points of technique, the book includes a number of art plates covering various aspects of Broadcasting.

The excellent reception accorded the first edition of this book since its appearance in 1942 has prompted the author to undertake this revised edition.

Though largely devoted to the interests of the general reader, this book will provide much useful information to the Radio technician.
 C. R. K.

The Rubber Industry in India. By Dr. N. N. Godbole. A.I.M.O. Monograph No. 6. (All-India Manufacturers' Organisation, Bombay). Pp. 24.

This is a cursorily written pamphlet of but 24 pages (4"×6") of which five are devoted to History, six to Chemistry, four to Latex, and the rest to Rubber Trade and Technology. There is not enough of useful information in any of the sections, excepting perhaps to some extent in the last, and the general usefulness of this pamphlet in this well-known series is very doubtful.

Sargentia—No. V. *Fragmenta papuana* (observations of a naturalist in Netherlands New Guinea). By H. J. Lam. Pp. 1-196, with two maps and thirty-two text-figures. Translated from the Dutch by Lily M. Perry. (Published by the Arnold Arboretum of Harvard University, Jamaica Plain, Mass., U.S.A.), 1945. Price \$ 3.00.

This publication of the Arnold Arboretum, being a translation into English of Professor Lam's original Dutch work, has come to be under the stress of war. To-day information is sought for, as never before, regarding poorly known flora of several parts of the globe. Dr. Lily M. Perry's efforts with inspiration from Dr. Frans Verdoorn is, therefore, amply rewarded by the wealth of information she has presented in the volume both topographical and botanical. Dr. Perry's appreciation of Prof. Lam's presentation of botanical enumerations and descriptions and his faithful recording of detail is fully justified by this excellent publication. It would be impracticable to dwell, within the space of this review, on the various botanical details presented therein. Nevertheless, the statistics of the collection given as below may convey an idea of the richness of the flora of the Netherlands New Guinea.

The entire collection of Professor Lam has been placed in 109 plant families. Of the 109 families studied, 467 members represent 285 species, of which 103 are new. In the Pteridophytes the 344 members belong to 204 species, of which 66 are new.

In addition to the description of these plant material the author has very ably presented minute details of the Ecology of the terrain and the occurrence of respiratory roots and pneumatophores in mangrove rattan—hitherto undescribed; of fragrant flowered *Barringtonia* sp.; of other trees with enormous prop-roots, etc. There are excellent sketches of landscape, other drawings of plant material and a good deal of information on Myrmecophilous plants which make reading very pleasant. Publications of this description should find a place in college libraries, for it stimulates thinking in the undergraduate botanist on the modes of describing floras of localities in a country like ours where great patches of vegetation are still largely a *terra incognita* from the botanical point of view.
 T. S. SADASIVAN.