BOOK SECTION

New Publications

A Practical Manual of Industrial Finishes, by B. M. Letsky, published by Reinhold Publishing Corpn, New York, and Chapman and Hall Ltd., London, 1960, 250 pages, $8.

Cobalt: Its Chemistry, Metallurgy, and Uses, by R. S. Young, published by Reinhold Publishing Corp, New York, ACS Monograph 149, 1960, 424 pages, $15.

Zone Refining and Allied Techniques, by N. L. Parr, published by St. Martin's Press Inc., New York, 1960, 184 pages, $8.50.

Cobalt Monograph, by E. E. Fletcher and others, Centre D' Information Du Cobalt, available from M. Weissenbruch S. A, Brussels, Belgium, 1960, 515 pages.

Advances in X-Ray Analysis, by W. M. Mueller (Ed), published by Plenum Press Inc, New York, 1960, Vol. 2-359 pages, Vol. 3—376 pages.

Fuel Cells—Power for the Future, published by Fuel Cell Research Associates, Cambridge, Mass, U.S.A. 160 pages, $18.75.

The Electro-Erosion Machining of Metals, by A. L. Livshits, published by Butterworth and Co (Publishers) Ltd., London, 1960, 126 pages, 30sh.

Symposium on Newer Metals, published by the American Society for Testing Materials, Philadelphia, 1960, 218 pages, $7.25.

Atomic Theory for Students of Metallurgy, by W. Hume-Rothery, published by the Institute of Metals, London, Monograph and Report Series No. 3, 1960, 427 pages, £2 10sh.

Hydrogen Peroxide Data Manual, published by Laporte Chemicals Ltd, Luton, Beds, U. K.

Tinplate Testing—Chemical and Physical Methods, by W. E. Hoare and S. C. Britton, published by the Tin Research Institute, Greenford, Middx, U. K., 1960, 55 pages.

Proceedings—Short course on Process Industry Corrosion, published by the National Association of Corrosion Engineers, Houston, U.S.A. 450 pages, $25.

1956 Bibliographic Survey of Corrosion, by N. T. Atlas (Compiler), published by the National Association of Corrosion Engineers, Houston, U.S.A. NACE Publ. No. 60-12, 1960, 248 pages, $27.50.

Mechanical Properties of Intermetallic Compounds, by J. H. Westbrook (Ed), published by John Wiley and Sons, Inc, New York, 1960, 435 pages, $9.50. Proceedings of a Symposium held under the aegis of the Electrothermics and Metallurgy Division of the Electrochemical Society, Philadelphia, May 1959.

Analytical Chemistry of the Rare Earths, by R. C. Vickery, published by Pergamon Press, New York, 1961, 139 pages, $6.50.

Advances in Polarography: Proceedings of the Second International Congress held at Cambridge, 1959, by I. S. Longmuir (Ed), published by Pergamon Press (Symposium Publications Division), Oxford, London, New York and Paris, 1960, Vols 1, 2 and 3, 1204 pages, £15.

Elementary Science for Electroplating Students and Foremen, by E. A. Ollard, published by Robert Draper Ltd, Teddington, Middx, England, 1961, 99 pages, 18sh.

Fourth Soviet Conference on Electrochemistry, published by Consultants Bureau Enterprises Inc, New York, English Translation, 1961, 3 volumes of 300 pages each, $15 and $40 for set.

Publications Received

Chemical Age of India, Vol. 12, No. 1, 2, 1961, Technical Press Publications, Bombay.

Electro-Technology, Vol. 4, No. 5, 6, 1960, Society of Electronic Engineers, Bangalore.

Science and Appliance, Vol. 25, No. 2-4, 1961, The Ohio State University Research Foundation, Columbus, Ohio U.S.A.

C.S.I.R. News, Vol. 11, No. 5-9, 1961, New Delhi.

The Nickel Bulletin, Vol. 33, No. 12, 1960; Vol. 34, No. 1, 1961, The Mond Nickel Co. Ltd., London.

Wiggin Nickel Alloys, No. 60, 1961, Henry Wiggin and Co. Ltd., Birmingham.

Metal Finishing, Vol. 59, No. 2-4, 1961, Metals and Plastics Publications Inc, Westwood, N. J. U.S.A.

Insdoc List, Current Scientific Literature, Vol. 8, No. 6-9, 1961, Insdoc, New Delhi.

Quarterly Bulletin of Steel Statistics for Europe, Vol. 11, No. 3, 1960, prepared by the Secra-

tariat of the Economic Commission for Europe, United Nations, Geneva.

Battelle Technical Review, Vol. 10, No. 2, 3, 1961, Battelle Memorial Institute, Columbus, Ohio, U.S.A.

Review of Metal Literature, Vol. 18, No. 1-3, 1961, American Society for Metals, Novelty, Ohio, U.S.A.

Ronuk Industries Ltd., Bombay: Chromium, Lead, Cadmium, Gold, Silver Copper, Nickel, Zinc, Brass, Tin and Tin Alloy Plating; Cleaning before Plating; Polishing of Metals.

Corrosion Prevention and Control, Vol. 8, No. 2, 3, 1961, Scientific Surveys Ltd., London.

Industrial Finishing, Vol. 13, No. 152, 153, 1961, Arrow Press Ltd., London.

Metal Finishing Journal, Vol. 7, No. 74, 75, 1961, Industrial Newspapers (Fuel and Metallurgical) Ltd., London.

ZDA Abstracts, Vol. 19, No. 1-3, 1961, ZDA, London.

British Patents, Group 36, The Patent Office, London.

Electroplating and Metal Finishing Vol. 14, No. 3, 4, 1961, Robert Draper Ltd., Teddington, Middx, England.

Corrosion, Vol. 17, No. 2, 3, 1961, NACE, Houston, U.S.A.

The Fundamentals of Electrochemistry and Electrodeposition, by S. Glasstone, published under the auspices of the American Electroplaters' Society by Franklin Publishing Co., Palisade, N. J., U.S.A., second ed, 1960, 90 pages, $ 3.20

Journal of the Indian Institute of Science, Vol. 43, No. 2, 1961, I.I.Sc., Bangalore.

Cobalt, No. 10, 1961, Centre D' Information Du Cobalt, Brussels.

Crerar Metals Abstracts, Vol. 9, No. 4, 5, 1960, The John Crerar Library, Chicago.

A Survey of Nickel and Chromium Recovery in the Electroplating Industry, by E. P. Harris, published by the Dept. of Scientific and Industrial Research London, 1960, 41 pages.

International Atomic Energy Agency Bulletin, Vol. 3, No. 2, 1961, IAEA, Wien, Austria.

Australian Journal of Applied Science, Vol. 12, No. 1, 1961, CSIRO, East Melbourne.

Metal Industry Handbook and Directory 1961, published by Iliffe Books Ltd., London, No. 50, 560 pages, 21 sh.

Electroplating, India, Vol. 3, No. 1, 1961, Bombay.

Australian Corrosion Engineering, Vol. 4, No. 1-7, 12, 1960, Australian Association for Corrosion Prevention, North Sydney.

BOOK REVIEWS

The Fundamentals of Electrochemistry and Electrodeposition, *by* S. GLASSTONE, published under the auspices of the American Electroplaters' Society by Franklin Publishing Co., Palisade, N. J., U.S.A., 2nd ed, 1960, 90 pages, $3.20.

The first edition of this book was published in 1943 in order to provide a simple introduction to electrochemistry to the practical electroplater. The present volume is a reprint since the copies originally printed were exhausted. It will no doubt continue to be a success since, as stated in the foreword ". . . . the exposition of the fundamentals of electrochemistry and electrodeposition has stood the test of time". The American Electroplaters' Society has to be congratulated in arranging the publication of the second edition.

The book consists of 20 chapters covering all the important topics related to electrodeposition: ions and conductivity, Faraday's laws, pH, electrode potentials, deposition potentials, hydrogen overvoltage and concentration polarization, complex cyanides, nature of deposits, passivity and corrosion. The subject matter has been presented in a simple manner with the necessary illustrations, and the treatment is excellent. Only an elementary knowledge of physics and chemistry is required in order to assimilate the contents. The author is well known for his books on electrochemistry and physical chemistry, and this contribution leaves practically little to be desired. There are hardly any books of this type in scientific literature. This concise publication contains extremely useful information on the principles of electrochemistry as applied to electrodeposition. It is a "must" to the job plater, the student, and also those interested in the science and art of plating.

—T. L. R.

Metal Industry Handbook and Directory 1961, published by Iliffe Books Ltd., London, 560 pages, 21sh.

This is the 50th edition of the well-known Handbook published every year by "Metal Industry". The number of pages, the contents and presentation are about the same as the 1960 number, with some revisions at several places in

order to bring the publication up-to-date. It is divided into 4 sections: general properties, general data and tables, electroplating and allied processes, and directory. The matter under properties of the metals has been revised, and D. T. D. specifications on metal finishing have been included. The directory for buyers is enlarged.

Section 3 on electroplating and allied processes certainly deserves more space and elaboration of contents. For instance, it will be very useful to treat electropolishing in some detail. There is no mention of new types of plating baths, like fluoborate and sulphamate for nickel, and fluoborate and pyrophosphate for copper. The title "chromium plating" on page 415 is rather misleading, since pages 415 and 417 cover other metals and alloys. The solutions and operating conditions for the plating of alloys of tin with copper and nickel could have been given.

Inspite of a few shortcomings, which are not serious, this volume contains a fund of valuable information for the metallurgist, chemist and engineer. The Handbook and Directory can be safely recommended as a reference publication for all those concerned with metals and metal finishing.

— T. L. R.

Ronuk Publications on Practical Electroplating, published *by* M/s. RONUK INDUSTRIES LTD., Bombay, 1960, each about 50 pages — Rs. 1.50 — Rs. 2.00 per booklet.

This series of publications consists of twelve booklets on different aspects of electroplating — Polishing of metals, Cleaning before Plating, Brass Plating, Cadmium Plating, Copper Plating, Chromium Plating (Decorative and Hard), Gold Plating, Nickel Plating, Lead Plating, Silver Plating, Tin and Tin Alloy Plating and Zinc Plating.

The booklet on cleaning prior to electroplating deals in general various cleaning operations for ferrous and non-ferrous materials. Different types of cleaners like soak and electrolytic and their mode of use and recommended practice are described. Where necessary, concentration and optimum temperature are indicated. The booklet on polishing of metals describes the different polishing composition, bobs and mops. Information on the preparation of a new mop and wheel for emery cutting, dressing of the wheels, etc. are included in this booklet. Advantages of abrasive belt polishing over the conventional emery bobbing are described. Polishing methods and suggested sequence of operations are also given. Details of finishing different basis surfaces like brass, steel, stainless steel, nickel, silver etc., and electroplated surfaces like nickel, chrome, brass, are given. Peripheral speeds of the bobs or the mops are given as a guide to the polisher and recommended surface speeds are indicated.

In the publications on electroplating all the common types of plating are included. In describing each of the plating operations the publishers have followed a general pattern — general information regarding uses and applications, directions for use of their salts including concentration, preparation of the solution, temperature, current density and voltage, anodes and maintenance of the bath. A schematic diagram to the sequence of operations is shown in each booklet, and this will go a long way in helping the plater to regulate the process according to correct sequence. Treatment after plating is described in the case of zinc, cadmium and chromium plating. Recommended thicknesses of various deposits are also indicated. The inclusion of time and current for depositing a specified thickness is a welcome addition in publications of this type. Barrel plating has been treated separately in each case and recommendations for the efficient working are given. Measurement of thickness of the deposit with relevant details will help the plater to produce quality work. At the end of each booklet, plating faults and the remedies are given, and this enhances the value of this concise and neat publication on plating.

The booklets are clearly printed on good paper and attractively produced. The text is clearly written. The price of each publication is reasonable. As a whole the booklets contain useful information on practical electroplating, and the publishers have to be congratulated as these technical publications are brought out for the first time in India. Contents of the booklets have not been included in all cases, and this inclusion would increase the usefulness of these publications. The booklets can be recommended to all interested in production plating.

— S. K.

A Survey of Nickel and Chromium Recovery in the Electroplating Industry *by* E. P. HARRIS, Published by the Department of Scientific and Industrial Research, Regent Street, London, 1960, 44 pages.

The Department of Scientific and Industrial Research (DSIR) U K., sponsored an enquiry into the losses of nickel and chromium during electroplating and the results are presented in this small and concise booklet. This work has been carried out with the co-operation of British Non-Ferrous Metals Research Associa-

tion (BNFMRA) and it is stated in the preface that the Association has already issued a report on this work to its members and DSIR is presenting this to a larger audience with a view to emphasising the wider implications of the survey. The primary object of the survey is to investigate the possibility of reducing losses of nickel in the electroplating industry and incidentally the loss of chromium, the reduction in consumption of water and the means of reducing waste in the effluent.

The booklet is divided into five sections. Section one deals with nickel. The report says that the plating industry consumes more nickel than is actually deposited by plating, the excess arising mainly from the failure to recover nickel solution adhering to the work when it is removed from the plating bath. The principle source of nickel loss is in this solution drag out. Other sources of loss are loss in purification, by leakage and by stripping rejects. Assessment of the solution losses has been made by relating the nickel content of the salts consumed to anode consumption and the results are tabulated. The author has analysed the loss in cost and has shown that the chemicals consumed add to the process about 11 per cent of nickel in excess of that deposited as plating, increasing the cost of raw material by 13 per cent. It is interesting to note from the analysis of the solution losses that drag out accounts for 33 percent, solution purification 20 per cent, filter cleaning 37 per cent, and pumping 10 per cent. The economic value of static drag out tanks and the technical problems involved in their use are described in detail. Flow diagrams for the utilisation of nickel and recovery from rinse water have been incorporated.

Section two deals with the loss of chromium. The principle sources of loss are drag out from the plating bath and the spray produced in the course of plating. A breakdown of the loss of chromic acid is as follows: deposited as plating 13 per cent, drag out and first rinse loss 67 per cent, and loss in spray formation 20 per cent. The author has dealt with the problem of recovery of water in section three. Consumption and cost of water are given in a table and comparison has been made on the consumption of nickel anodes, as a measure of the work done and a comparison has been made of gallons of water used per pound of the nickel anode consumed. Though this is subject to some inaccuracy, it is a practical way of comparing the consumption of water in various industries. Various methods of reducing water consumption by employing different rinsing processes are described.

In section four ion exchange processes for the recovery of water, nickel and chromium are described. Though this process is attractive, it is not widely used as it is very costly. Practices in a few firms to recover water, chromic acid and nickel are described briefly. A schematic diagram for the recovery of water from mixed effluent, chromium, copper and nickel by ion exchange method is given. In section five a general survey of the methods of treatment of effluent has been made followed by a diagram of recovering nickel and water by ion-exchange.

The booklet has been well written bringing out the economics of the recovery of nickel, chromium and water in electroplating processes and contains valuable information. Inclusion of permissible limits of various contaminents in plating shop effluent would have increased the utility of the book.

—S. K.