BOOK SECTION

New Publications

Analysis in the Chemical Industry by L. A Haddock, published by Pergamon Press, 220 pages, 25sh.

ASM Bibliography Series: (A) 1967—(1) Anodizing B77-2, (2) Electrical Discharge and Electrochemical Machining B-77-9: (B) 1968—(1) Ultrasonic Testing B84-20, (2) Electrocoating, Plastic Coating and Enameling B-84-21, (3) Cleaning, Degreasing and Deburring B84-22, (4) Induction Heat Treatment B84-23, published by American Society for Metals, Metals Park, Ohio, $ 10 each.

Scanning Electron Microscopy, by P. R. Thornton, published by Chapman and Hall, London, 1968, 368 pages, 80sh.

Microphotography, by G. W. W. Stevens, published by Chapman and Hall, London, 2nd ed., 1968, 504 pages, £ 6.

Inorganic Chemical and Metallurgical Process Encyclopedia, by M. Sittig, published by Noyes Development corpn, New York and London, 1968.

Protective Painting of Structural Steel by F. Fancutt, J. C. Hudson, A. T. S. Rudram and J. F. Stanners, published by Chapman and Hall Ltd., London, 136 pages, 35 sh.

Metallic Material: An Introduction to Metallurgy, by P. S. Hurd, published by Holt Rinehart and Winston Inc., London, 1968, 381 pages, $ 8.95.

Modern Methods of Chemical Analysis, by R. L. Pecsok and L. D. Shields, published by John Wiley & Sons, Inc. New York, 1968.

Einfuhrung in die Galvanotechnik, by B. Gaida, published by Eugen G. Leuze Verlag, Salgau/Wurtt, Germany, 1968, 270 pages, approx., DM25.

Nickel and Its Alloys, by S. J. Rosenberg, NBS Monograph 106, 1968, 156 pages, $ 1.25, US Govt. Printing Office, Washington D.C.

Internal Stresses in Electrolytically Deposited Metals, by M. Ya. Popereka, published by West Siberian Book Publishers, Novosibirsk, 1966, 335 pages, Rbls. 1.30; in Russian.

Chromium, 2nd Edition, by A. H. Sully and E. A. Brandes, published by Butterworths, London, 1968, 373 pages, $ 19.50.

Stress-Corrosion Cracking of Aluminium Alloys, A Review of the German Literature, Report AD-666 083, 22 pages, $ 3, US Dept. of Commerce, Clearinghouse for Federal and Scientific and Technical Information, Springfield, Va.

Concise Inorganic Chemistry, by J. D. Lee, published by D. Van Nostrand Co., Ltd., London; Affiliated East-West Press P. Ltd., New Delhi, 2nd ed., ELBS, 276 pages, Sh. 15.

Kinetics in Analytical Chemistry, by H. B. Mark and G. A. Rechnitz, published by John Wiley & Sons, Ltd., Chichester, Sussex, England, 1968, 339 pages, 160 sh.

Chemical Resistant Materials, Part 2, published by the Engineering Equipment Users' Association, London, 1968, 87 pages, 27 sh. 6 d.

Symposium on Transformation and Hardenability in Steels—Ann Arbor, Michigan, 1968, sponsored by Climax Molybdenum Co., of Michigan Inc. and the University of Michigan, published by Climax Molybdenum Co., Ltd., London, 1968, 212 pages.

Tabellen fur die Galvanotechink, compiled by E. Lutter, H. Benninghoff and O. P. Kramer and edited by H. Leuze, published by Eugen, G. Leuze Verlag, Saulgau/Wurtt, 3rd ed. 1967, 305 pages, DM32.

Military/Industrial Plating Specs Guide, published by Lea-Ronal Inc., Freeport, N.Y., U.S.A.

Technical Metallurgy, by D. R. Cliffe ,published by Edward Arnold Ltd., London, 1968, 414 pages, 45 sh.

Science in Modern Society, by J. G. Crowther, published by Cresset Press, London, 1967, 403 pages, 50 sh.

Handbook of Fuel Cell Technology, by C. Berger (Ed.), published by Prentice-Hall, 607 pages, $ 18.50.

Electrochemistry of Molten and Solid Electrolytes, Volume 7, by A. N. Baraboshkin (Ed.),

published by Consultants Bureau—Pleum Press, New York, translation from Russian, 1969, 100 pages approx. $ 15.

Corrosion and Oxidation of Metals: First Supplementary Volume by U. R. Evans, published by Edward Arnold, London, £ 6 sh 10.

The Periodic Table—Fourth Edition, by D. G. Cooper, published by Butterworths, London, 128 pages, 12 sh.

Gunmetal Castings, by F. Hudson and D. A. Hudson, published by MacDonald (Publishers) Ltd., London. 420 pages, 147 sh.

Literature on Molybdenum containing Steels, Irons and Non-Ferrous Alloys, published by Climax Molybdenum Co., Ltd., London.

Polarography, by D. R. Crow and J. V. Westwood, published by Barnes and Noble, 174 pages, $ 5.

Electroerosion and Electrochemical Processing of Metals, by V. I. Kurchenko, published by Mashinostroenie, Moscow, 1967, 107 pages, 38k; in Russian.

Chemical and Electrochemical Corrosion of Lead Alloys, by J. A. Gonzalez, J. J. Royuela and S. Feliu, published by ILZRO, Res. Rept. Project No. LE-70, 1967, 165 pages.

1968 Book of ASTM Standards, Part 7: Non-ferrous Metals and Alloys, Electrodeposited Metallic Coatings, Metal Powders, Non-ferrous Filler Metal, Non-ferrous Surgical Implant Materials, published by American Society for Testing and Materials, Philadelphia, 1010 pages.

Modern Aspects of Copper in Electrical Engineering—Conference Proceedings, published by Copper Development Association, London, 1968, 45 sh.

Radiation Corrosion, by A. V. Byalobzheskii, published by Nauka, Moscow, 1967, 216 pages, 84k.

Hyperfine Structure and Nuclear Radiations, by E. Matthias and D. A. Shirley (Ed.), published by North Holland Publishing Co., Amsterdam, 1968, 1111 pages, 186 sh.

Molecular Forces, published by North Holland Publishing Co., Amsterdam, 1968, 822 pages, 186 sh.

A Short Course in Quantitative Analysis, by H. H. Willard, N. H. Furman and E. K. Bacon, 2nd Ed., published by D. Van Nostrand Co., U.S.A.; Affiliated East-West Press, P. Ltd., New Delhi, 1968, 256 pages, $ 1.85 or Rs. 10.00.

Chemical Applications of Potentiometry, by H. Rossotti, published by D. Van Nostrand Co., Inc., London, 1969, 70 sh.

World Mining International Glossary of Technical Terms, Volume 1, published by World Mining, San Francisco, 266 pages, $ 20.

Titanium for the Chemical Engineer, by D. J. Maykuth and J. D. Jackson (Ed.), published by US Air Force Materials Laboratory, Wright-Patterson Air Force Base, DMIC Memo 234, 1968, 63 pages; obtainable from Defense Metals Information Center, Columbus, Ohio.

Metallic Materials, by R. B. Ross, published by Chapman and Hall, London, 1968, 936 pages, £ 6 sh 6.

Corrosion in Steel Plants, published by Corrosion Advisory Burea, CSIR, Jamshedpur, 1969, 118 pages, Rs. 16.

The Chemical Formulary, Volume 14, by H. Bennett (Ed.-in-Chief), published by Chemical Publishing Co., Inc., New York, 376 pages, $ 8.

Fundamentals of Qualitative Chemical Analysis, 4th Ed., by R. K. McAlpine and B. A. Soule, published by D. Van Nostrand Co., U.S.A., Affiliated East-West Press Ltd., New Delhi, 1969, 352 pages, Rs. 10 or $ 1.50.

Publications Received

Copper, Vol. 2, No. 5, 6, 1968, CDA, London through Indian Copper Information Centre, Calcutta.

OSU Research Review, Vol. 5, No. 1, 3, 1968, Office of Research and the Research Foundation, Ohio State University, Columbus.

HTS Digest, Vol. 8, No. 4, 1968, HAL Technical Society, Bangalore.

Soviet Review, Vol. 5, No. 85, (Soviet Spaceship Soyuz), 92, 1968; Vol. 6, No. 9, (Soyuz 4 and 5), 10, 1969, Information Dept., USSR Embassy in India, New Delhi.

Chartered Engineer, Vol. 8, No. 10, 1968, ICE, New Delhi.

UN Weekly Newsletter, Vol. 16, No. 48-52, 1968; Vol. 17, No. 1-9, 1969, UN Information Service, New Delhi.

Scientific Research, Vol. 3, No. 15-24, 1968, McGraw-Hill Inc., New York.

The Merck Index, Eighth Edition, published by Merck & Co., Inc., Rahway, N. J., U.S.A., 1968, 1713 pages, $ 15.

Endeavour, Vol. 27, No. 102, 1968, ICI Ltd., London.

Korrozios figyelo, Vol. 8, No. 4, 1968, Budapest.

CSIR News, Vol. 18, No. 22-24. 1968; Vol. 19, No. 1-3, 1969, New Delhi.

The Bridge, No. 1, 1968; No. 2, 1969, Embassy of the Federal Republic of Germany, New Delhi.

Metal Finishing Journal, Vol. 14, No. 165-167, 1968, Fuel and Metallurgical Journals Ltd., London.

Wiggin Nickel Alloys, No. 91, 1968, Henry Wiggins & Co., Ltd., Hereford, England.

British Patents, Division H1, Patent Office, London.

Battelle Technical Review, Vol. 17, No. 9, 1968, Battelle Memorial Institute, Columbus, Ohio.

Cobalt, No. 4, 1968, Cobalt Information Centre, Brussels.

Chemical Age of India, Vol. 19, No. 11, 12 (19th Anniversary), 1968; Vol. 20, No. 1, 2, 1969, Technical Press Publications, Bombay.

Industrial Finishing, Vol. 20, No. 243-245, 1968, Arrow Press Ltd., London.

Metal Finishing, Vol. 66, No. 9-11, 1968, Metals and Plastics Publications, Inc., Westwood, N.J., U.S.A.

Anti-Corrosion Methods and Materials, Vol. 15, No. 9-11, 1968, Sawell Publications Ltd., London.

Pinchin Johnson and Associates Ltd., London: (1) Electro-painting under control, (2) Corrossion and its Prevention, (3) Paint Review.

Corrosion Bulletin, Vol. 5, No. 3, 4, 1968, CSIR, Jamshedpur.

Platinum Metals Review, Vol. 12, No. 1, 1968, Johnson, Matthey & Co., Ltd., London.

Flourel Brand Elastomers, published by 3M Co., Minnesota, 43 pages.

Electrical Methods of Maching and Forming, published by the Institution of Electrical Engineers, London, Conference Publication No. 38, 1967, 261 pages, £ 3.

Corrosion Engineering, by M. G. Fontana and N. D. Greene, published by McGraw-Hill Book Co., 1957, 391 pages, $ 12.50.

Electromotive Force Measurements in High-Temperature Systems, by C. B. Alcock, published by the Institution of Mining and Metallurgy, London, 1968, 227 pages, £ 5.

Advances in Extractive Metallurgy, published by the Institution of Mining and Metallurgy, London, 1968, 1023 pages, £ 10.

American Reporter, Vol. 18, No. 23, 24, 1968; Vol. 19, No. 1-4, 1969, US Information Service, New Delhi.

Zinc Abstracts, Vol. 26, No. 9-11, 1968, ZDA, London through Indian Lead Zinc Information Centre, Calcutta.

Philips Light Bulletin, Vol. 14, No. 4, 1968, Philips India Ltd., Bombay.

Lead Abstracts, Vol. 8, No. 9-11, 1968, LDA, London through Indian Lead Zinc Information Centre, Calcutta.

ISI Bulletin, Vol. 20, No. 12, 1968, New Delhi.

NML Technical Journal, Vol. 10, No. 4, 1968, Jamshedpur.

Cuba, No. 1, 1968, Embassy of Cuba, New Delhi.

Science and Engineering, Vol. 21, No. 11, 12, 1968; Vol. 22, No. 1, 1969, ISE, Calcutta.

USSR Probes Space, published by Novosti Press Agency Publishing House, through USSR Embassy in India, New Delhi.

Technical Data Sheets, published by M. & T. Chemicals Inc., New York, 1967-1968.

Galvanotechnik, Vol. 59, No. 9-11, 1968, Eugen G. Leuze Verlag, Salgau/Wurtt.

The Principles of Current Methods for the Study of Electro-Chemical Reactions, by B. B. Damaskin, prepared by Scripta Technica, Inc., translated and edited by G. Mamantov, published by McGraw-Hill Book Co., Hightstown, N.J., U.S.A., 1967, 112 pages, $ 4.95.

Information News Letter—Industrial Liaison & Extension Services, Vol. 7, No. 3, 1968, CSIR, New Delhi.

Instruments News, Vol. 3, 1968, CSIO, Chandigarh.

Australasian Corrosion Engineering, Vol. 12, No. 9-11, 1968, North Sydney, N.S.W.

Journal of the Electrochemical Society of Japan, Vol. 36, No. 3, 1968, Tokyo.

Lead Acid Battery (Lead Power 68), published by Indian Lead Zinc Information Centre, Calcutta, 1968, 32 pages.

Lead 65—Edited Proceedings Second International Conference on Lead, Arnhem published by Pergamon Press Ltd., Oxford, 1967, 337 pages, 110 sh.

Australian Chemical Engineering, Vol. 9, No. 9-11, 1968, North Sydney, N.S.W.

Interfinish 68 — Proceedings Seventh International Metal Finishing Conference, Hannover, published by Deutsche Messe-u. Ausstellungs A, G. Hannover, 1968, 351 pages, DM 66.60.

Cavitation Corrosion and Its Prevention in Diesel Engines — Symposium, 1965, by I. Dugdale and R. Wall (Ed.), published by British Railways Board, London 47 pages, 30 sh.

Metallurgy for Engineers, by E. C. Rollason, published by Edward Arnold (Publishers) Ltd., Maidenhead, Berks, England, 1968, 392 pages, 25 sh.

Electro-Technology, Vol. 12, No. 5, 1968, Society of Electronic Engineers, Bangalore,

Fuel Cells and Fuel Batteries—A Guide to their Research and Development, by H A, Liebhafsky and E. J. Cairns, published by John Wiley and Sons, Inc, New York, 1968, 692 pages, $ 27.50.

Stainless Steel, No. 8, 1968, Stainless Steel Development Association, London.

Aluminium Courier, No. 83, 1968, Aluminium Federation, London.

Zinc—A Mine to Market Outline, published by American Zinc Institute Inc., New York, 1967, 79 pages.

Introduction to Thermodynamics of Irreversible Processes, by I. Prigogne, published by John Wiley & Sons, Inc., New York, 3rd ed., 1968, 147 pages, $ 5.95.

The Electrochemistry of Oxygen, by J. P. Hoare, published by John Wiley & Sons, Inc., New York, 1968, 423 pages, $ 19.50.

High-Temperature Materials and Technology, by I.E. Campbell and E. M. Sherwood (Ed.), published by John Wiley & Sons, Inc, New York, Electrochemical Society Series, 1967, 1022 pages, $ 27.50.

Journal of the Indian Institute of Science, Vol. 51, No. 1, 1969, Bangalore.

UN Publications: (1) The Hydro-Electric Potential of Europe's Water Resources, Volume 1: Methods of Analysis and their Application, 1968, 51 pages plus Annex, $ 3.50; (2) Agricultural Mechanization—Methods and Equipment for Dyring of Green Feed, 30 pages, $ 0.75; (3) Annual Bulletin of Coal Statistics for Europe, Volume 1, 1968, $ 2; (4) Annual Bulletin of Electric Energy Statistics for Europe 1967, 1968, 82 pages, $ 1.50; United Nations, New York through UN Information Service, New Delhi.

Quarterly Bulletin of Steel Statistics for Europe, UN, New York, Vol. 19, No. 2, 1968, through UN Information Service, New Delhi.

Galvanizers Bulletin, No. 2, 1969, Indian Hot Dip Galvanizers Association, Calcutta.

Nonferrous Metals and the Chemical Engineer, I. Titanium, II, Nickel and Magnesium,' by by R. L. Carmichael, reprinted from Chemical Engineering, 21 November 1966, 14 pages.

Technique of Inorganic Chemistry by H. B. Jonassen and A. Weissberger (Ed.), Volume VII, published by John Wiley & Sons, Inc., New York ,1968, 327 pages, $ 16.

BOOK REVIEWS

Electrochemical Machining, *by* A. E. DeBarr and D. A. Oliver, published by Macdonald and Co. (Publishers) Ltd., London, 1968, 248 pages, 70 sh.

This book is the latest in the Macdonald 'Trends and Development in Engineering' series. It deals with almost all the aspects of electrochemical machining in thirteen chapters, *viz.*, (1) Introduction, (2) Chemical and electrolytic methods of machining, (3) Simple theory of electrochemical machining, (4) The working gap, (5) Electrochemistry, (6) Electrolytes for electrochemical machining, (7) The treatment of spent electrolyte solutions, (8) Electrolyte flow, (9) Tool design, (10) The Design of electrochemical machines, (11) Power supplies, (12) The application of electrochemical machining and (13) The future of electrochemical machining. Relevant reference to literature is cited in each chapter. This also contains an exhaustive bibliography. There are six appendices, which include the corrosion rates of various materials exposed to electrochemical machining solutions, some commercially available electrochemical machine tools, and British patents on electrochemical machining.

The publishers, editors and authors should be congratulated for the stupendous efforts taken in publishing such a useful volume on ECM, a technique relatively new and non-conventional. The major disadvantage of the process is the tool design, and it is heartening to see that a full chapter is devoted to design itself. The volume is well printed, and has dealt with the subject in an exhaustive and elegant manner. It will be extremely useful for the students of engineering and applied science, research workers, potential users and

designers. This novel technique of machining has its own advantages and disadvantages. The book under review deals with them splendidly and offers recipes for the disadvantages. The potential users of this technique will feel at ease itf they happen to have a copy of this book.

— V. K. V. U.

Corrosion Engineering, *by* M. G. Fontana and N. D. Greene, published by McGraw-Hill Book Co., New York, London, etc., 1967, 391 pages, $ 12.50.

This is an excellent treatise on corrosion science, technology and engineering, and Fontana is well known for his work in the field of corrosion. The authors and the publishers are to be congratulated for bringing out this volume.

The book consists of 11 chapters: (1) Introduction, (2) Corrosion principles, (3) Forms of corrosion, (4) Corrosion testing, (5) Materials, (6) Corrosion prevention, (7-8) Acids and Other environments, (9-10) Modern theory—principles and applications and (11) Oxidation and other high-temperature metal-gas reactions. There is an index in the end.

As stated in the preface, it serves admirably well several purposes: elementary and advanced courses in corrosion, as well as dissemination of current knowledge on corrosion and its prevention. The space devoted to the different chapters is adequately balanced. The matter in chapter 5 on materials and chapters 7 and 8 on corrosive environments comes in very handy while dealing with specific corrosion problems. The topics have been handled in a most satisfactory fashion, with tables, figures and references to support.

The publication is doubtless amongst the outstanding ones on the principles and practice of corrosion and corrosion prevention. It is moderately priced. It should find a place on the shelf of all those concerned with corrosion problems, as a textbook and as a reference—the student, electrochemist, metallurgist, technologist, engineer and industrialist.

—T.L.R.

Quality Metal Finishing Guide: (1) Copper-Nickel-Chromium and Nickel-Chromium Coatings, 28 pages, $ 1; (2) Zinc and Cadmium Coatings, 27 pages, $ 1, published by Metal Finishing Suppliers' Association, Inc., Birmingham, Mich, U.S.A.

In their efforts to upgrade the quality of metal finishes, the Metal Finishing Suppliers' Association, published a guide containing information of Copper-Nickel-Chromium and Nickel-Chromium coatings, and this has been reprinted based on the popularity of the publication. The guide gives information on design for plating, selecting the finish, specifying the finish and testing the finish. Copper-Nickel-Chromium on other surfaces like aluminium and plastics is also described. The guide contains a glossary of Metal Finishing terms and Bibliography. It "presents information on how to achieve quality of articles finished with Copper-Nickel-Chrome by attention to design details of the part itself, by selecting the best type of coating for the intended service, by supplying adequate specifications and by selecting methods of test which will assure compliance with the specifications." This publication will be of great interest to the practical plater and electrochemists.

Of equal interest is the second publication on zinc and cadmium coatings. It also covers design, selection of the finish, specification and testing. A glossary and a list of specifications are included.

—S.K.

Anti-Corrosion Reference, presented with August 1968 issue of Engineering Materials and Design, published by Heywood-Temple Industrial Publications Ltd., London, 36 pages.

This is an excellent guide to corrosion and preventive methods. It deals with the form of corrosion, material selection and design, economics of protection, organic or metallic finishes, chemical conversion coatings, and protection—general, paints, vitreous enamelling and plastics. The matter is well supplemented with tables, illustrations and references to literature.

—T.L.R.

The Electric Industrial Truck, published by Australian Lead Development Association, Melbourne, 35 pages; available from Indian Lead Zinc Information Centre, Calcutta.

This is an informative brochure on the elecrtic industrial truck. Beginning with the operating advantages, there is an outline on comparison of costs, lead-acid traction battery development, gas powered trucks and future trends. The next 3 sections cover calculation of cost comparisons, calculation of required battery capacity and the lead-acid traction battery. There are several tables and figures. This is indeed a fascinatingsubject today, since the electric truck has many attractive features. The publishers

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broad objectives of the investigation was to obtain further information on the structure of porous minerals and then attempt to correlate the structural parameters obtained with the ability to move oil out of the rock mass. The writers took up the suggestion of Debye that light scattering techniques might prove useful for these studies. After some preliminary experiments with sections of rock samples, however, they felt it would be preferable initially to conduct studies with model systems and that is how these investigations of a fundamental nature resulted.

Each chapter contains references for further reading. The presentation of the matter is excellent. This volume will no doubt be of great interest to those who wish to keep in touch with the latest developments in the field.

—H.M.

Zinc—A Mine to Market Outline, published by American Zinc Institute, Inc., New York, 79 pages.

The importance of zinc in the present day world needs no emphasis, and the publishers have rendered a valuable service in bringing out this concise monograph on the various facets of the metal. Beginning with an introduction and early history, the publication gives an account of sources, production, the world of zinc, zinc as a trace element, and miscellaneous items. The fifth section—" the world of zinc " includes coatings, casting, cathodic protection, pigments and other topics. There are several tables and illustrations. This is quite an interesting volume on zinc.

—T.L.R.

The Merck Index, Eighth Edition, 1968, published by Merck and Co., Inc., Rahway, N.J., U.S.A., 1713 pages, $ 15.

Merck is a familiar name all over the world, and equally famous is the Merck Index which is now in the eighth edition. The major portion is taken by Monograph section on chemicals and drugs, and this is followed by Organic Name reactions, miscellaneous tables, formula index and a comprehensive cross index of names. The first edition was published as long back as 1889, and the seventh in 1960. The present volume is a revision of the previous one, with additions and modifications. Adequate references to literature have been given in the Monograph to obtain detailed information from the source where necessary. This book is strongly recommended as a " must " for quick reference to substances in general and organic chemistry and in medicine. The price is moderate.

—T.L.R.

The Principles of Current Methods for the Study of Electro-chemical Reactions, *by* B. B. Damaskin, translated and edited by Gleb Mamantor, published by McGraw-Hill Book Co., New York, 1967, 112 pages, $ 4.95.

This small book, by the famous Soviet electrochemist, attempts to present the principles of potentiostatic, galvanostatic and alternating current methods which are currently used to study the kinetics of fast electrode processes. The book contains only 4 chapters and in the introduction the author discusses the importance of the reaction rate constant, K° as the criterion in comparing the capabilities of various electrochemical methods. Several mathematical expressions are also introduced which are used in later chapters.

The first chapter deals with the basic potentiostatic (potential-step), voltage-step and cyclic potentiostatic methods. The second chapter is devoted to the galvanostatic methods which include the basic, cyclic, double pulse and coulostatic methods. Several a.c. methods—faradaic impedance, faradaic distortion, faradaic rectification—are discussed in the third chapter. Each method is discussed with reference to principle, theory, determination of the kinetic parameters and its application to Analytical Chemistry. The structure of the electrical double layer, which has not been taken into account in the above treatment because of mathematical complications is considered in the last chapter, and the corrections to be applied to the various electro-chemical reaction parameters like K°, α (transfer coefficient), i_0 (exchange current) because of this effect is discussed.

A list of important references is given at the end of the book. Schematic circuit diagrams are included. The treatmet is concise and excellent. The book, however, contains a few obvious misprints (for *e.g.*, $\frac{nFC^{*}D^{\frac{1}{2}}}{t}$ for $\frac{nFC^{*}D^{\frac{1}{2}}}{(\pi t)^{\frac{1}{2}}}$—page 10; $cm^2/sec.$ for $cm/sec.$, page 18).

This book will be useful to biochemists, organic chemists, analytical chemists who are interested in electrode processes and it is needless to stress the importance of this book to an electrochemist.

—(Miss) M.S.

USSR Probes Space, published by Novosti Press Agency Publishing House, through Information Dept., USSR Embassy in India, New Delhi.

This brochure gives a detailed account of the Soviet achievements in space, beginning with the launching of the world's first artificial earth satellite in 1957 to international cooperation and application to peaceful uses. The subject matter is well described in about 30 pages, and supplemented with illustrations running to about 50 pages.

—T.L.R.

Technical Data Sheets on Electroplating, published by M & T Chemicals Inc., New York.

M & T are well known in the field of electroplating and metal finishing, and the data sheets issued by them are very useful. They include bright nickel, copper: acid-cyanide-pyrophosphate, high speed chromium, plating on aluminium, tin and bronze plating, polishing and miscellaneous.

—T.L.R.

Lead Acid Battery (Lead Power 68), published, by Indian Lead Zinc Information Centre Calcutta, 1968, 32 pages.

Lead Acid Batteries have become quite popular for various industrial applications, and this booklet gives an excellent account of the recent developments, with special reference to applications. There are 50 illustrations which are self-explanatory. The matter contained here will, of course, be of interest in India in the context of industrial expansion programmes.

—T.L.R.

Electromotive Force Measurements in High-Temperature Systems—Proceedings of a Symposium, London, 1967, *by* C. B. Alcock (Ed.), published by The Institution of Mining and Metallurgy, London, 1968, 227 pages, £ 5.

In 1967, a Symposium on Electromotive Measurements in high temperature systems was held under the aegis of the Nuffield Research Group in Extractive Metallurgy, Imperial College, London. Eleven papers were presented at four technical sessions, and these together with the discussions on them are published in this volume.

Electromotive force measurements in high temperature systems is a relatively new research topic, and during the last decade the development of solid state electrochemistry has centred around the oxide electrolyte system introduced by Wagner and Kiukkola. Though the majority of the papers deal with the solid oxide electrolytes, a few papers on liquid electrolytes are also included.

The presentation of the papers is clear and concise, and between them they cover the recent advances in laboratory thermodynamic and kinetic techniques involving the use of these electrolytes. Steele's paper on temperature thermodynamic measurements deals with the theoretical and practical aspects of the use of the solid electrolytes. Electrochemical measurements of oxygen in silver and copper is the subject of a paper by Diaz and Richardson. Alcock's paper is on the transport of ions and electrons in ceramic oxides. Kinetic measurements with solid electrolytes is the subject of an important paper by Rickert. The paper by Carter and Roth discusses the conductivity and structure in calcia stablized zirconia. Other papers presented deal with galvanic cells reversible to fluoride ions, nonstoichiometric measurements in dioxides and measurement of activities in solid binary alloy systems. The papers on liquid electrolyte systems deal with electrode melt interface at high temperatures (Inman), electron transfer processes at the liquid metal-molten alkali halide interface (Graves and Inman) and activities in PbO-containing melts (Jeffes and Sridhar).

The book provides a good deal of valuable information representing many recent advances in the field. It is very clearly printed and has a good index. Another pleasing aspect is the comparatively short interval between the meeting and the publication. The volume is recommended for any library serving the needs of metallurgists and electrochemists, and it should be of interest to every one working in the field of electromotive force measurements in high temperature systems.

—K.P.A.

Fluorel Brand Elastomers, Technical Information Data Sheets, 43 pages plus other papers, published by 3 M Co., Chemical Division, St. Paul, Minnesota, U.S.A.

Very useful information is provided in the data sheets, covering an introduction, Fluoral Elastomer 2140 and 2141, compounding the elastomers, processing, applications and an appendix. There are 24 tables containing important data. This is supplemented with 2 papers of 23 and 12 pages on other aspects. Fluorocarbon elastomers find application in several industries, and the present publication

comes in handy to all those who wish to know something in this field.

—T.L.R.

Technical Literature from Pinchin Johnson and Associates Ltd., London: (1) Electropainting under Control, (2) The Paint Film as a Corrosion Barrier and (3) Paint Review.

Electropainting has established itself as an elegant process in organic finishing today, and the present literature highlights the salient features. The publishers are amongst the pioneers in the field. The first brochure gives a concise account on the process, control, plant design and operation, applications and future possibilities; it is adequately illustrated. The topic is covered in the second, a published paper. The review is a general purpose pamphlet. One can indeed obtain the basic information needed on this developing technique.

—T.L.R.

Electronic Properties of Semiconducting Solid solutions, *by* Aleksei B. Almazov, translated from Russian by Albin Tybulewicz, published by Consultants Bureau, New York, 1968, 82 pages.

Semiconducting solid solutions are interesting because of their many possible applications. These materials may even replace the stoichiometric crystals, as their properties can be changed gradually by a continuous variation of their composition, while retaining at the same time many features of the classical semiconductors.

The book consists of two parts. Part I which contains six sections deals with the theory of the electronic properties of a semiconducting solid solution. For simplicity sake this is restricted to a binary solid solution having a unipolar n-type or p-type conduction. Part II gives the experimental data in four reactions, *viz.*, atomic solid solutions; solutions of A^{III} B^{V} compounds, other solid solutions, and glassy semiconductors. As the author himself claims, the chapter on references lists only some important references and is not exhaustive. The translator has done a good job and the language is lucid. This book lis a must for all the scientists working in the field of semiconductors.

—(Miss) V. K.

Practical Emulsions, Volume II—Applications, *by* H. Bennett, J. L. Bishop, Jr., and M.L. Wulfinghoff, published by Chemical Publishing Company, Inc., New York, Third Ed., 1968, 204 pages, $ 13.

This revised edition lists various proprietary materials currently sold by American Companies in making up emulsions for use in agricultural products, polishes, cleaning agents, cosmetics, food and pharmaceuticals, textiles, plastics, leather, rubber and paper industries. It may be of some use to those prospective buyers of these American goods and to other users of them who have forgotten their home work.

—P.L.N.R.

Advances in Extractive Metallurgy, published by the Institution of Mining and Metallurgy, London, 1968, 1023 pages, £ 10,

This volume comprises the 38 papers presented in 9 sessions at a symposium organised by the Institution of Mining and Metallurgy and held in London from 17th to 20th April 1967. The dicussions on the papers and the authors' replies are also included. As is to be expected in such a symposium, a wide variety of topics in extractive metallurgy is covered, including pyrometallurgical and hydrometallurgical processes, electrometallurgy, control and general subjects.

The papers presented in session I deal with problems in measurement and control associated with pyrometallurgical processes and application of computers to problems of production scheduling. There is at present much interest in applying automation methods and this is emphasized in the two papers devoted to this subject. However, it is surprising to find that developments in iron and steel making processes are not adequately represented.

The growing interest in and importance of agglomeration of ores by sintering and pelletization is emphasized in four papers presented in session 2. Papers presented in sessions 3 to 6 are devoted to developments in pyrometallurgy and electrometallurgy of non-ferrous metals. The importance of kinetics and mechanisms of reactions involved in these processes are stressed in three papers. An important paper in this field deals with the kinetics of reaction between levitated drops of metal and flowing gases. Other papers deal with the extraction and refining of non-ferrous metals like copper, nickel, cobalt, chromium and tin. The processes discussed range from suspension smelting to recovery by chlorination in fluidized beds and include a paper on electrorefining by molten salt electrolysis. Solvent extraction and ion exchange techniques have made much

progress in recent years. In session 7 four papers dealing with solvent extraction are presented, while session 8 is devoted to papers dealing with ion exchange techniques. The importance of hydrometallurgy has increased at the present time, and this topic is represented by five papers presented in the last session. Bacterial leaching and pre-treatment of minerals before leaching are dealt with as techniques of considerable potential importance.

The collection of papers contains considerable amount of useful and interesting material, and affords the opportunity of keeping abreast, with the advances made in the fields discussed, The book is well printed, has a good index and will be of great value to extraction metallurgists and others in a similar fields of endeavour.

—K.P.A.

Electrical Methods of Machining and Forming, published by the Institution of Electrical Engineers, London, Conference Publication No. 38, 1967, 261 pages, £ 3.

The Institution of Electrical Engineers organised, in collaboration with the Institution of Mechanical Engineers and the Institution of Production Engineers, London, a conference in December 1967 in London. This volume is a special publication of twentytwo papers presented at the conference. The contributors are specialists in their field, and the publication covers recent developments in the new technique—electrical methods of machining and forming. The papers are grouped under five major headings. Four papers discuss lasers—machining, micro-machining. With the increased use of integrated circuits in the electronic industry, production of thin slices of silicon plates using laser beams has assumed importance. In the production of integrated circuits and thin film resistors high velocity electron beams have been in use for many years for both welding and machining. The new developments and use of this method are surveyed by the authors in five papers. Electrolysis has recently found application as a machining process largely in aero-engine industries. Four papers describe the tool shape, power supply, and review the progress in electrochemical machining. Electrohydraulic forming is a new process in which a transient high pressure is created by means of an electrical discharge in a liquid. The transient high pressure is used in forcing metal into a die or mould to form desired shapes. There are five papers on electrohydraulic and electromagnetic forming. The last group of three papers is on spark erosion machining, glow discharge guns for material processing and use of arc plasma for cutting. In all the above processes discussed, the important tool is a large power capacitor. Charging of power storage capacitor is considered in one paper.

The publication is well produced and has a number of illustrations. The publishers deserve to be commended in bringing to the attention of potential users the new electrical methods of machining and forming that are now being developed in a number of research and development laboratories. It will serve well as a ready reference on the subject, and should interest those in the field of electromachining and forming.

—S.K.