(B) INDUSTRIAL ELECTROCHEMISTRY AND INDUSTRY

1. The impact of technology on man and his world—

L. Hynes (Chemistry and Industry, No. 26, 1112, 1967). Society of Chemical Industry, London Medal Award Lecture. The thesis is that changes are being forced upon Society at a rapid rate by technical progress, and that we must not only recognize these changes but also re-examine our social relationships which are in danger of being overwhelmed by the fruits of scientific discoveries.

2. A hundred years of chemical industry in Canada—

C. J. Warrington (Chemistry and Industry, No. 26, 1117, 1967). Introduction, technology and material development, the electrochemical phase, developments before, during and after the two world wars, present situation.

3. Laser welding of electronic equipment—

M. Nelles and P. H. Scharf (Indian and Eastern Engineer, **109**, 345, 1967). Introduction, current connection methods, laser characteristics and welding requirements, experimental, production-type laser, future developments.

4. An improved method for making starting sheets for electrolytic copper refining—

B. Helmerson (Trans. Met. Soc. AIME, **236**, 1570, 1966). Describes a machine used in Sweden since 1961 to make starting sheets for electrolytic copper refining. Present maximum capacity is 250 sheet assemblies per hour, corresponding to a daily demand of 1300 sheets for the tankhouse. Quality of the machine-produced sheets is superior to those produced manually, and they are claimed to provide higher current efficiency with greater production of finished cathode copper.

5. The scrap metal industry—

G. L. E. Metz (Purchasing J, Non-Ferrous Metals Suppl. pp. 43, 45, 47, December 1966); abstract in Copper **1**, No. 3, 39, 1967. The value of world production of non-ferrous metals from scrap, which increased steadily during 1960-1964 ,is about £1,000 million annually. About 40 per cent of copper used by British industry is derived from scrap.

6. Current developments in zinc as an engineering material—

A. R. L. Chivers and F. C. Porter (Engineers Digest, **28**, No. 1, 75, 77, 1967); abstract in Zinc Abstracts, **25**, 153, 1967. A description of the recent principal developments in zinc alloy die casting and in zinc coatings, with reference to applications. New zinc alloys, instrumentation, coatings in corrosion protection and paints.

7. Black chromium plating at commercial plating—

E. A. Blount (Products Finishing, **31**, No. 10, 72, 1967). Job plater installs black chromium to expand services, offer additional facilities to customers and reach new markets. Here is an account of the process, with 7 figures.

8. Scientific-technical basis for development of electrolytic production of chlorine and caustic soda—

G. M. Kamar'yan (Zh. Prikl. Khim, **40**, 334, 1967); abstract in Chem. Abs., **66**, 11266, 1967. A detailed historical, scientific and technological review of electrolytic chlorine and sodium hydroxide production in the world, with special stress on the developments in the U.S.S.R. New trends in cell design and performance of new types of cells described.

9. Technical personnel for chemical industry—

S. K. Sanghvi (Chem. Age of India, **18**, 609, 1967). The necessary of having suitable personnel for the growth of the chemical industry in India has been discussed. Three figures, 3 tables and 6 references.

10. Chemicals—a key industry in the U.S.S.R.—

(Chem. Age of India, **18**, 669, 1967). A brief account of the growth of the chemical industry in the U.S.S.R. The output in 1966 was 294 times that in 1913, and doubling the present figure has been envisaged in the current five-year plan. The target for caustic soda in 1967 is 1.5 million tons, and the plans up to 1970 include the development of heat-resistant polymers, high-density polymeric construction materials and high grade points.

11. New Process solves nitrate corrosion—

(Chem. Engg. **74**, No. 14, 108, 1967). Interrelated corrosion and processing problems are solved through careful design of ammonium nitrate plants; 7 figures and 4 references.

12. The steam condenser—a review of development. Part I—materials—

J. P. Quayle (Copper, **1**, No. 4, 2, 1967). Reviews the qualifications and behaviour of the copper metals most suitable for tube and tube-plate applications. Includes dezincifications, cathodic protection, ferrous sulphate treatment, impingement attack, steam side attack. Figures and 8 references.

13. The electrolytic refining of copper with periodic imposition of alternating current—

L. A. Kryuchkov and coworkers (Trudy Ural' skogo Nauchn.—issled. i Proektn. Inst. Medn. Prom.; No. 8, 356, 1965); abstract in Copper Abstracts, No. 7097, 1967. Mineralogical, spectroscopic and x-ray analysis showed that the best cathodic copper deposits are obtained with a.c. applied for 1 second. The best deposit is formed with 20 seconds interruption in the a.c. The cathodic polarization during the interruption of the a.c. is almost unchanged and is less than that during electrolysis using d.c. only.

14. Stripping by electricity—

(New Scientist, **33**, 400, 1967). Electrohydraulics—the generation of powerful shock waves in water by the passage of underwater sparks—has recently been applied to stripping of metal coatings electrodeposited or to cathodes in metal refineries. This can be done in a few seconds and the possibility of damage to the cathode eliminated. Cathodes can be stripped two at a time or in sets. The stripped metal falls from the cathodes either in larger sheets (copper) or as a powder (antimony).

15. Electroless copper vs. electroless nickel—

(Product Finishing, **20**, 43, March 1967). For plating plastics, electroless nickel is faster than copper and has less tendency to deposit on racks or tanks, thus being more suitable for automation; close control of sensitization and activation of the plastic is, however, essential. Electroless copper is better suited to bulk processing.

16. Electrophoretic paint application and installation—

M. Hood (Metal Finishing, **65**, No. 7, 53; No. 8, 61; No. 9, 69, 1967). Introduction, control important, paint composition, 5 figures; flexibility, technical progress, electrocoating and electroplating, 1 table and 6 figures; base surface and cleaning, pH control, bath, instrumentation, equipment, 7 figures.

17. Some production plating problems and how they were solved, Part XII—

D. R. Millage (Plating, **54**, 838, 1967). Nickel shortage, blisters, bright nickel, roughness.

18. Practical problems in copper cyanide plating—

H. Geduld (Metal Finishing, **65**, No. 7, 46; No. 8, 52, 1967). Introduction, low free cyanide, high anode current density, chromium contamination, high free cyanide, metallic impurities; anode bags and diaphragms, airborne dirt in solution, high carbonates, temperature, cleaning, copper strike, metallic impurities, sulphur contamination, other deposit defects.

19. Use of the refractory metals in corrosive environment service—

J. Chelius (Metals Engineering Quarterly, **7**, No. 3, 57, 1967). The mechanical and corrosion resistance properties of tantalum, columbium, tungsten and molybdenum are reviewed in terms of applications in the chemical processing industries.

20. Electrodepositing paint: materials, procedures, equipment—

R. L. Koch (Products Finishing, **31**, No. 11, 45, 1967). Introduction, pretreatment, paint control, equipment, replenishment system, power supply, spray rinse, cost, advantages.

21. Take another look at bright acid copper—

J. J. Becker (Products Finishing, **31**, No. 11, 72, 1967). A report on bright acid copper plating—improved baths, suggestions for use and troubleshooting hints; 2 tables and figures.

22. Ultrasonics in the plating industry. A brief review of some current applications—

W. D. Mogerman (Plating, **54**, 941, 1967). Introduction, ultrasonics—ranges and uses, cleaning, equipment, generators, transducers, electroplating; 6 figures and 7 references.

23. Electrocoating aluminium extrusions—

J. E. Anderson (Products Finishing, **31**, No. 12, 70, 1967). Steps involved in finishing aluminium extrusions, quality control tests; 4 figures.

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but stopping at all suitable places to show how the characteristic features of metals, alloys and the processes of practical treatment grow out of this science".

There are 25 chapters including prologue. Atomic nucleus, atomic structure and chemical bonding are dealt briefly in the first three chapters. In the next three chapters the elements of thermodynamics are outlined. The main principles of extraction of metals and their refining processes with suitable examples are discussed in three chapters. Iron and steel making—introduction, chemistry of iron making, different types of steel making processes, occupies one complete chapter. The kinetics of metallurgical reactions like diffusion, heat conduction, and nucleation are discussed in chapter 12. Structures and properties of metal crystals, which is the starting point for many important topics like plastic deformation, mechanical strength, diffusion, heat-treatment etc., are dealt in detail. Other topics are: the phase diagram, alloys—electronic structure, properties, uses, heat treatment; mechanical, properties, plasticity, oxidation and corrosion. At the end of each chapter references are given for further reading.

The book is written in a simple style and is well produced. Though the author has not gone deep into any one aspect of the subject, the book gives a broad view of the subject and will be of great interest and help to the beginners in this field.

—(Miss) M.S.

(*Continued from page* 38)

24. Brush plating techniques—

E. Groshart (Metal Finishing, **65**, No. 9, 75, 1967). Equipment, process, solutions, control; figures and 2 references.

25. Is it time to reconsider electroforming?—

R. G. Dermott (Metal Progress, **92**, No. 3, 69, 1967). Success in automotive dies and mandrels, seamless pressure vessel, production experience pinpoints problems, need for progress, new standards.

26. Data sheet: A guide to selection of minimum plating thickness for quality coatings—

(Metal Progress, **92**, No. 3, 92, 1967).

27. Designing stainless processing equipment. Ways to bridge the experience gap—

T. D. Parker and J. Z. Briggs (Metal Progress, **92**, No. 3, 103, 1967). Selection criteria based on service tests, grade of stainless, design considerations, pressure vessels, heat exchangers, cladding. Three tables and figures, including data on corrosion resistance.

28. Corrosion problems in the chemical industry. Part 2—

R. H. Banfield (Anti-Corrosion Methods and Materials, **14**, No. 10, 12, 1967). Stainless steel filter gauzes, air-compressor after-cooler, refrigerator cooler, circulating water pumps, Bayonet filter elements—mechanical example; figures.

29. The economics of high quality anodizing—

(Industrial Finishing, **19**, No. 231, 46, 1967). Introduction, plant, temperature control, d.c. supply, quality and process testing equipment, cost data.

30. Rinse water recirculation in combination with the integrated waste treatment method—

R. Pinner (Electroplating and Metal Finishing, **20**, 280, 1967). Instrumentation, practical aspects, importance of mixing, entrapped solution, problems with barrels, cost of water recirculation; concluded with tables and figures and 41 references.

—T.L.R.