49. Induction heating: A different way to cure paint—

O. M. Rennells (Products Finishing, **29**, No. 6, 34, 1965). Not a 'cure-all' but a specialised, high-speed method that has great potential when it is applicable.

50. The Nickel silvers—

K. T. Rowland (Copper, No. 23, 14, 1965). Introduction, advantages and applications. One table on compositions and available forms; figures.

51. Hydrogen embrittlement of high-tensile steels during chemical and electrochemical processing—

L. E. Probert and J. J. Rollinson (Metal Finishing J, **11**, 103, 1965). Detailed report of experimental work; one table and 21 references.

52. Do you know your way around fixed capacitors?—

F. G. Gore (Electro-Technology, **8**, 295, 1965). Capacitors perform many functions and each one is designed to excel in a specific application. This article endeavours to help the designer find his way among the variety of capacitors being manufacutured these days. One table and 8 references.

53. Electrolytic chlorine and caustic soda industry in Japan II.—

H. Tsukada (J. Eelctrochem. Soc., Japan, **32**, 63, 1964). Continuation of review: consumption figure, price and quality; typical cells in Japan; plant capacity and production; figures and tables.

54. The chlor-alkali industry—

H. A. Sommers (Chemical Engg. Progress, **61**, No. 3, 94, 1965). A complete review of the factors affecting costs in this important area of the CPI including details and operating characteristics of the major cells now on the market. Two tables, 18 figures and 37 references.

55. Chelation chemistry—its importance to water treatment and chemical cleaning—

W. E. Bell (Materials Protection, **4**, No. 2, 78, 1965). Describes use of chelation chemistry in the field of water treatment and chemical cleaning where removal of water deposits and corrosion control are of utmost importance.

—T. L. R.

(B) Electrometallurgy

1. Stress-corrosion cracking—

R. N. Parkins (Metallurgical Reviews, **9**, 201-261, 1964). Review: introduction, intergranular and transgranular cracking, effects of stress and plastic strain, dislocations and stress-corrosion cracking, electrochemical aspects of stress-corrosion: 120 references.

2. Industrial high-temperature applications of nickel-rich alloys—

J. E. Wightman (Foundry Trade J, **117** 431, 1964). Detailed attention is given to specific industrial uses in power units—gas turbines and piston engines—and the hot working tools used in die-casting and forging.

3. Electrowinning molybdenum and tungsten—

D. H. Baker (J. Metals, **16**, 873, 1964).

4. Open-hearth steel from an all-scrap charge—

L. B. Lindemuth (J. Metals, **16**, 891, 1964). The no-iron open-hearth steelmaking practice utilizes an electric furnace-type scrap charge, coke, and oxygen-natural gas roof burners.

5. Molten-salt electrorefining of uranium—

F. R. Cattoir and T. A. Sullivan (U. S. Bur. Min. Rep. Invest, No. 6507, 1964); abstract in J. Appl. Chem., i-127, 1965. Commercial uranium metal was electrorefined to a high-purity product, containing less than 30 ppm of impurities, using molten salt electrolyte-lithium/sodium, potassium and uranium chlorides in an inert atmosphere cell.

6. Use of mercury in electrometallurgy—

G. Jangg (Chem-Ingenior-Tech, **36**, 681, 1964). Use of liquid mercury as electrodes in the electrolytic extraction and refining of sodium, manganese, arsenic and iron; use of amalgams as reducing agents in cementation operations and for the reduction of metal chlorides in the extraction of titanium, zirconium, uranium and thrioum; separation of metals by amalgamation; fabrication of metal alloy powders and sintering of metal powders suspended in mercury; 35 references.

7. Causes and forms of losses of precious metals in refining slags—

S. S. Pyshov, N. I. Utkin and F. M. Ananyev (Izv Vuz Tsvetnaya Met, No. 3, 73, 1964); abstract in Rev. Met. Literature, **22**, No. 1, MO3-131142, 1965). Visual, laboratory and

industrial analysis of waste slags of various compositions indicate that the bulk of the precious metals in refining slags are lost in the form of mechanically entrapped regulus of the matte.

8. **The preparation of high-purity thorium by the magnesium reduction of thorium tetrachloride—**

D. T. Peterson, W. E. Krupp and F. A. Schmidt (J. Less Common Metals, **7**, No. 4, 1964); abstract in Rev. Met. Literature, **22**, MO3-1339, 1965. Magnesium metal is used to reduce purified thorium tetrachloride and to form a liquid thorium-magnesium intermediate alloy. The latter is processed to a thorium-sponge metal which is consolidated by electron-beam melting. The metal contains a total of 250 ppm of impurities and can be prepared in kilogram quantities.

9. **Anode furnace refractory practice at Inco's copper refining division—**

E. F. Rabeau (Can. Mining Met. Bull, **57**, 959, 1964). Details of design, construction and operation of reverberatory furnaces.

10. **New process for the thermal refining of copper—**

J. Olea (Tech. Met, **19**, No. 150, 205, 1963); abstracts in Rev. Met. Literature, **22**, No. 1, MO3-13942, 1965. Method for refining blister copper to tough pitch. Metal is melted in a basis lined, rotating furnace using an injected air atmosphere. Analytical data given showing the impurity content of the pitch and a comparison of conventional copper refining to this method.

11. **Electron-beam purification of hafnium—**

W. E. Anable and R. A. Beall (Rep. Inv. No. 6560, US Dept. Int, Bur, of Mines, 30 pages, 1964); abstract in Rev. Met. Literature, **22**, No. 1, MO3-14093, 1965. A study to determine the change in composition of hafnium buttons melted in an electron beam furnace as a function of time and energy input.

12. **Present status and future trends in the production of magnesium—**

J. D. Hanawalt (J. Metals, **16**, 559, 1964). Review of the current status of the several thermal reduction and electrolytic methods of production, application and future prospects; 13 references.

13. **Arc-furnace steel making at Firth Brown—**

P. W. Clark and F. C. Martin (J. Iron and Steel Inst, **203**, pt 1, 2, 1965). A description is given of the melting and casting facilities of the Firth Brown electric melting shops at Sheffield, and the general steel making practice for low-alloy and stainless steels. Some of the problems associated with the production of a wide range of special steels are discussed, together with exmaples of process development to meet the rising standards. Twelve tables, 20 figures and 6 references.

14. **Progress in electric furnace smelting of calcium carbide and ferro-alloys—**

O. Braaten and O. Sandberg (Fifth International Congress on Electrothermics, Wiesbaden, 1963). An account of recent trends in design and costs.

15. **Importance of industrial vacuum melting techniques in non-ferrous metallurgy—**

E. Erben and F. Sperner (Z. Erzbergbau und Metallusuesen W, **17**, 526, 1964); abstract in Rev. Met. Literature, **22**, No. 2, MO3-15588, 1965. Review of vacuum induction heating, vacuum arc melting and electron beam melting; application of these techniques in melting and casting; technology and thermodynamics of vacuum melting of nonferrous metals.

16. **Electro-slag refining—**

(Australisian Mannf, **49**, No. 2527, 52, 54,56, 58, 1964); abstract in Rev. Met. Literature, **22**, No. 2, MO4-15848, 1965. Electroslag refining process is described and schematically illustrated. Refining effect on a carbon-chromium ball bearing steel which was melted through a slag is shown, indicating reductions in silicon, sulphur, phosphorus, mangnese, nitrogen and oxygen content. Transformer requirements for process are specified.

17. **Recent developments in induction heating—**

G. D. Phillips (Metal Treatment, **32**, 93, 1965). Introduction, temperature consistency, forging quality and improvement flexibility, future of induction heating; appendix on heating furnaces.

18. **Aluminium and its alloys in 1964. Some aspects of research and technical progress reported—**

E. Elliott (Metallurgia, **71**, 61, 1965). Report on research and technical progress, covering the

U. K. and U. S. A., in the various aspects of the metallurgy of aluminium and its alloys—including extraction, founding, fabrication, properties and standardisation. Sixtynine references.

19. **The iron and steel industry in a developing economy—**

E. K. Sandbach (Indian and Eastern Engineer, **107,** 213, 1965). This article discusses the prerequisites for building an iron and steel plant; the benefits which accrue to the economy when a basic iron and steel industry is established; the step by step evolution of such a project.

20. **Recent developments in Soderberg electrode practice in carbide operation—**

R. E. Scherrer and M. L. Stott (J. Metals, **17,** 193, 1965). Introduction, electrode casings, building the electrode, use of electrode paste, electrode operating procedures; 12 figures.

21. **Trends in high-temperature alloys—**

R. F. Decker and R. R. DeWitt (J. Metals, **17,** 139, 1965). A review of developments in superalloys and chromium-base alloys, including the needs and trends seen to the year 1970. Six tables, 10 figures and 13 references.

22. **High strength low alloy steels—**

(Materials in Design Engineering, **61,** No.2' 113, 1965). Materials and processes manual: types and forms, engineering properties, processing and fabrication. Tables, figures and references.

—T. L. R.