NEWS SECTION

SOCIETY REPORT

Meetings

An urgent meeting of the Governing Council of the Society was held on July 17, 1969, at the Indian Institute of Science.

Advertisement: Appeal

The Electrochemical Society of India has been publishing a quarterly technical journal for the past 18 years. The journal, the only one of its kind in the country, is being brought out to disseminate technical information among the Electrochemists and Engineers. It is appearing regularly without interruption.

The journal carries authoritative articles on the latest developments in the field of Electrochemistry. Besides establishing itself as a leading professional publication in India, the journal commands a fairly good circulation abroad including the U.K., U.S.A. U.S.S.R., West Germany and France. It is needless to emphasise the value of publicising your products in this journal.

Inspite of its increased circulation over the years, the advertisement rates have remained the same, With the enormous increase in the cost of printing materials, the production cost of the journal has also gone up. The Electrochemical Society being a non-profit organization has to fall back on the advertising revenue for running the journal. It has therefore now become necessary for us not only to increase the advertisement rates but to enlist the support of a few others who are not making use of this journal for their advertising. The revised advertisement rates as enclosed will be effective from 1st January 1970.

We earnestly appeal to you to extend your valuable support by way of liberal advertisements to the Journal.

GENERAL NOTES

Crucibles of Science

The March 13, 1969 issue of New Scientist contains a 32-page supplement with the above titled devoted to the laboratory as a creative environment for the pursuit of science — from conventional laboratories to unconventional ones. The titles of the articles are: (1) The craftsman's contribution, (2) Planned families; or laboratories by design, (3) Running an industrial laboratory, (4) A laboratory in a computer, (5) The laboratory of the void, (6) Islands as ecological laboratories, (7) Flames: labs for high-temperature chemistry, (8) Drifting in the arctic, (9) Growth of the rent-a-lab trade and (10) What makes a laboratory tick?

Foaming Fuel Cell

The current from a relatively simple hydrogen oxygen fuel cell has been shown to be increased 50 times by foaming the electrolyte with the hydrogen fuel. This work at the University

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JOURNAL OF THE ELECTROCHEMICAL SOCIETY OF INDIA

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of Pennsylvania promises a new departure in fuel cell design that could get over some of the present limitations and make it cheaper. One of the immediate practical advantages of the foamed cell will be that the very costly microporous platinum electrodes used in the Apollo 9 spacecraft cell to achieve a high current density could be replaced by plate electrodes which would merely be coated with platinum. — New Scientist, Vol. 42, No. 648, 297, 1969.

The Fluidized Electrode in the Battery

A promising step towards removing some of the drawbacks of the zinc-air battery has been made in the U.K. by replacing the short-lived anode with an anode of tiny balls of glass, fluidized by a flowing electrolyte. — New Scientist, Vol. 41, No. 633, 181, 1969.

Stress Corrosion Cracking

There are 6 papers of interest covering several aspects of stress corrosion cracking in the April 1969 issue of Werkstoffe and Korrosion : causes and mechanism, influence of silicon and molybdenum in steels, unalloyed and alloyed steel, aluminium-zinc-magnesium alloys, aluminium-zinc-magnesium castings, and stainless steels.

Aerospace Materials and Processes for the 1970's

The March 1969 issue of Metal Progress is a special number containing the following articles : (1) Jet engine materials for the 1970's, (2) Titanium's role in superjet engines, (3) SST propels titanium into production era, (4) Materials and process for the Boeing 747, (5) Giant landing gears for the giant jets and (6) Organic quenchout aids heat treatment of dip-brazed aluminium parts.

Nickel in the Lunar Voyage

Nickel stainless steel played an important role in the ground support equipment used for the Apollo 10 launch — 1.25 million pounds of austenitic and 3.5 million pounds of nickel stainless steel; over 2 million pounds of nickel alloys in the crawler transporter; 40,000 pounds in alloy form in the rocket engines. The fuel cell power plants, equipped with pure nickel electrodes, provided up to 2,000 watts of electricity for the spacecraft. — Press Information, International Nickel, Bombay, August 1969.

Cleaning and Finishing

The advances in cleaning and finishing have been discussed in a large number of articles in the special issue of Metal Progress, June 1969. They cover organic coatings, plated plastics, coatings on titanium, anodic films, testing plated coatings, ideas for better finishing.

Liquids Handling

" A Complete Guide to Liquids Handling " is the title of the special issue of Chemical Engineering, 14 April 1969. It contains the following sections: properties of liquids, transportation, pumps process piping, valves, functional design, measuring and controlling, costs, suppliers directory, selected list of literature, other features.

Computers

The May 26, 1969 issue of Scientific Research is an issue on Computers, and contains many articles of interest—editorial, 1969 review with 6 articles, small computers and miscellaneous topics.

A Supercolossal Electron Microscope

The basic configuration of the EM7, a 1-million-volt microscope, is modeled on the 750-kilovolt electron microscope. It permits the examination of thicker specimens representing more accurately the material from which they are taken, and creates less electron scattering within the specimen. A whole cell can be examined at one time and **in vitrio** studies can be made of organisms several microns thick. Metallurgical specimens of up to 10 microns thickness are acceptable. The instrument's high-voltage beam provides the potential for achieving a theoretical resolution of 1A. Since the distance between the centres of atomic nuclei is about 3A, visualization of subatomic particles is now theoretically possible. The cost is 0.40-0.65 million dollars.— Scientific Research Vol. 4, No. 10, 39, 1969 (see also No. 14, 13, 1969).

Cobalt-base Alloys

The May 1969 issue of Metals Engineering Quarterly contains 4 papers of interests on cobalt-base alloys: (1) Microstructure of cobalt-base high-temperature alloys, (2) Relationship of properties to microstructure in cobalt-base super alloys, (3) In-process metallurgy of wrought cobalt - base alloys and (4) casting of cobalt - base super alloys.

Analytical Reviews

The April 1969 issue of Analytical Chemistry covers 1969 Analytical Reviews, and the topics include ferrous metallurgy, non-ferrous metallurgy — 1 and 2, and water analysis.

Mineral Processing Congress

Prague is the venue for the Ninth International Mineral Processing Congress to be held during June 1970. The topics scheduled for discussion are : comminution, classification, magnetic and electrostatic separation, gravity concentration, flotation, hydrometallurgy, pyrometallurgy, dewatering, waste water treatment, and automation of these processes.

IUPAC and Co-ordination Chemistry Conferences

The 22nd International Congress of Pure and Applied Chemistry, and 12th International Conference on Coordination Chemistry were held in Sydney, Australia during August 1969. The sessions for the Congress included Physical Chemistry, Macromolecular Chemistry and Inorganic Chemistry. The papers presented at the Coordination Chemistry Conference covered, amongst other topics, nature of the metal - ligand bond, mechanism of substitution and electron-transfer reactions, and complex equilibria in solution.

CHISA Congress

The Third International Congress on Chemical Engineering, Chemical Equipment and Automation was held at Marianske Lazne, Czechoslovakia during September 1969. The programme covered chemical reaction engineering, design and construction of chemical equipment, and process control and automation.

Metallic Corrosion Congress

Amsterdam in the Netherlands was the venue for the Fourth International Congress on Metallic Corrosion 1, 1969. The main themes dealt with were: (1) Corrosion Processes-mechanical influences, influence of radiation, high temperature oxidation, atmospheric corrosion, and other subjects; (2) Protection against corrosion : inhibitors, passivation and anodic protection, cathodic protection, nonmetallic coatings — organic and inorganic, metallic coatings, and other subjects; 129 papers were presented by scientists from 24 countries including India.

No Metals — No Industry

The June 1969 issue of Anti-Corrosion Methods and Materials has discussed the outlook for metals and substitutes. The annual world consumption of the important metals grew at the following rates during 1960–67: aluminium 12, nickel 8, steel 5.5, zinc 5.5, copper 5 and lead 3 per cent. There has been massive substitution of one metal for another and of non-metallic materials for metal. In terms of consumption there are great differences between countries—for example, for aluminium castings and semi-products 40 lb. in the U.S.A. per head per annum, as against 10 oz in India. There is thus clearly a huge unsatisfied demand for metals throughout the world. Plastics can make many inroads into metals' markets. Metals will fight back with thinner, stronger painted or coated semis and with better initial design. Other growing demands will be for germanium and silicon in the electronics industry; titanium and the high strength—for-weight steels in supersonic aircraft; nickel, chromium and molybdenum largely as alloying elements in steel for certain high-temperature applications.

Corrosion Research in Scandinavian Countries

The Swedish Corrosion Institute, Stockholm has issued a brochure entitled " Corrosion Research in the Scandinavian Countries — Review of Projects 1967/1968" (1968, 28 pages). It lists 49 current projects compiled by the Scandinavian Group for the study of corrosion, and covers Denmark, Finland, Iceland, Norway and Sweden, the major number concerning the last country. In each case, the institution, chief of the project and title of the investigations are given. The Institute has also published Bulletin No. 51, 39 pages, with 2 literature surveys: (1) A pulse polarizer and its use in corrosion research and (2) The dynamic condenser method in contact and surface potential measurements in studies of surface chemistry and corrosion.

Electron-probe Microanalyzer

Philips Electronic Instruments has come up with a 2,500 Å — resolution electron-probe microanalyzer using what it claims is an entirely new approach to determine the X-ray absorption of samples. Like other instruments the Philips Model 4500 is a cross between a scanning electron microscope and an X-ray spectrometer. The resolution is twice that of other microprobes, although it is not nearly as great as that of most scanning microscopes. It also

includes a 300X optical microscope for observing specimens being analyzed. The electron-probe microanalyzer is used extensively in metallurgy and geology, and also has many uses in the life sciences. — Scientific Research, Vol. 4, No. 14, 29, 1969.

Engineers' Day

The Second All India Engineers' Day was celebrated by the Mysore Centre, Instiution of Engineers (India) at Bangalore on September 13, 1969. The theme for the day was "The role of the engineering profession in the country in the context of planned development". A report on economy housing was also presented, and a buildings exhibition arranged.

Vapour Deposited Tungsten

The Fulmer Research Institute, England has developed considerable expertise in the vapour deposition of tungsten from the hexafluoride by hydrogen reduction, a method first suggested 10 years ago by the US Bureau of Mines and Bureau of Standards. Detailed investigations were made of the parameters involved—temperature, gas composition, gas flow, effect of hydrofluoric acid and other gases, efficiency etc. Coatings have been made on steel, stainless steel, nickel, cupronickel, niobium, tantalum and chromium. The tungsten is very pure, with a Vickers Hardness of 400-500. The deposition rate is about 0.5 mm per hr., and the thickness 0.0001-0.125 in. A factory has been put up for making tubes—1 to 10 mm diameter and 50 cm long, and crucibles. This is done on a suitable metal former like copper which is afterwards dissolved by acid. Fulmer began this work in 1962 as a result of interest shown by the Rocket Propulsion Establishment, the first deposits being on top quality graphite for rocket nozzles—Physics Bulletin, Vol. 20, 276, 1969.

Materials Science and Research

A Symposium on "Materials Science and Research—India" will be held under the auspices of the Department of Atomic Energy at NAL, Bangalore during February 1970. It will cover (*a*) review of the materials problems of the developing industries, (*b*) review the status of development of various classes of materials and (*c*) more recent experimental techniques and current research.

Heat Exchangers

The August 1969 issue of Chemical Age of India is a special on Heat Exchangers. It contains the editorial 12 feature articles, and short communications, covering various aspects.

Design and Analyasis of Chemical Process Systems

A Conference on the above subject has been planned during October 1969 at the I. I. T. Kanpur. Technical sessions include (1) Process development and pilot plant studies, (2) Process simulation. (3) Scale-up, (4) Process dynamics and control, (5) Process design, (6) Modification, improvement and scale down of existing processes and (7) Optimization. The list of the 32 papers presented can be found in Chemical Age of India, August 1969.

Tantalem-clad Copper Tubing

Tantalum-clad copper tubing, a development of the Metals Division of Norton Co., U.S.A., combines the excellent thermal conduction and bending properties of copper tubing with the acid resistance and anti-corrosion properties of tantalum. The titanium-clad copper tube is also considerably more economical than a tube made entirely of tantalum, as in bayonet heaters and thermowells in gorrosive applications.—Chemical Age of India, Vol. 20, 731, 1969.

Stainless Steel

A good deal of information on stainless steel and its applications is contained in Anti-Corrosion Methods and Materials, July 1969: commentary on the status of stainless steel including consumption figures for various countries; articles on (1) The principal corrosion — resistant applications, (2) Corrosion of stainless steel fibres and (3-4) Stainless steel in anti-corrosive applications and in the Apollo command module.

Australian Metalurgical Survey

Metallurgy in Austrlia has been surveyed in detail in Metals and Materials, July 1969, pages 241—268, under: minerals and metals, research, education and industries — products and prospects.

Geothermal Energy Symposium

A Symposium on the Development and Utilization of Geothermal Sources will be held in Pisa during September — October 1970 by the UN and the Italian government. Papers will be concerned with the whole range of

geothermal exploration and development activities.

Growth in the production of electrical power from geothermal sources is being accompanied by the development of new techniques. Currently some of the major geothermal generating projects have the following capacities: Italy 390, New Zealand 192, United States 82, Japan 20, U.S.S.R. 5 and Iceland 5 megawatts. Interest in the mineral content of thermal waters which often initiated development of geothermal resources has arisen again in various places including the salten sea in the United States and the Red Sea. UN technical assistance missions have been sent to assess geothermal energy potential in 19 countries in Africa, Asia, Oceania and the Americas. Large scale drilling projects are being carried out in Chile, El Salvador and Turkey.—World Mining, Vol. 20, No. 8, 68, 1969.

Electrolytic Zinc Co. of Australasia

An expenditure of 55 million dollars over a five-year period on a number of projects has been planned by this industry, and this is the most expansionary period in its history. At the Risdon refinery near Hobart, a fluid bed roaster and residue treatment plant will be built to increase zinc recovery from concentrate. This will necessitate extensions to the electrolytic refinery and zinc casting plant. The residue plant will treat 115,000 tons per year from a 900,000 ton dump carrying zinc 22.8, lead 5.2 and cadmium 0.22 per cent, and 6.6 oz. silver per ton. Total zinc output can be expected to reach 0.16-0.17 million tons per year.—World Mining, Vol. 20, No. 8, 71, 1969.

World Mining

The Polish mining industry is now one of the fastest expanding in Europe, and during the next few years this country will be the major producer of copper ore in Europe. The pace of new lead and zinc mine development is also rapid, and the reserves of sulphur are estimated to be the third largest in the world. Metallurgical processes have aroused much interest, and the objective is to see that the country occupies a key specialised position with regard to the manufacture of coal equipment.

Bunker Hill Co., Idaho is probably the most advanced computer controlled underground mine in the United States. Many of the box cars being loaded with electrolytic zinc and lead bullion have the series of electronic identification strips on their sides, and the latter identify the car as it passes key surveillance stations. Computers continuously trace and route these cars. This is an example of the mobile technotronic mining industry of today; technology advances at an exponential rate.—World Mining, Vol. 20, No. 8, 9, 1969.

Zinc Die Castings

Zinc Alloy Die Casting News, No. 8, 1969 contains several items of interest: Sixth International Pressure Die Casting Conference, International Zinc Die Casting Competitions and prize winners, Exhibition of Die Castings, Anodizing of Zinc Die Castings, and 1969 Survey of Die Castings in U.S. Autos. There are many illustrations.

Corrosion in Transport

The Australasian Corrosion Association held a Symposium on "Corrosion Problems in the Transport Industry" at the University of NSW, Kensington during August 1969. Topics covered corrosion problems in ships, road surfaces, aircraft and the motor car.

Melbourne International Metal Finishing Conference

The First Annual Conference of the Australasian Institute of Metal Finishing was held under the auspices of the Melbourne Branch during October 1968 at Melbourne. Nine papers were presented in 3 technical sessions: decorative and protective finishes, industrial finishing and electroplated plastics. The programme also included an exhibition of the latest scientific equipment for evaluation of electrodeposits and other surface coatings.

Rainbow in a Laser

Byelorussian scientists have completed work on a new type of laser. Unlike other lasers, which operate on rubies, gas mixtures or semiconductors, the new laser uses organic dyes as a light source. The possibility of building such installations was predicted theoretically in 1964 by Academician B. Stepanov and A. Rubinov. One of the first substitutes for costly ruby was common bluing. It has been proved that hundreds of dyes of all colours of the rainbow can be used as laser radiation sources producing beams of different colour. This is specially important for investigations in different media, such as in water, mist, clean air or crystals. The light

beam emitted by the new laser can extend for thousands of miles without changing its thickness. — Soviet Union, No. 10 (235), 31, 1969.

Electrochemistry

There are 2 articles of interest in the June 1969 issue of "Chemistry in Britain": (1) Electrochemistry in Britain and (2) Electrochemistry '69. The first one is a three-year survey showing that, despite the considerable amount of research in the field, certain areas urgently need investigation. In particular, it is stated that there are numerous opportunities for closer cooperation between industry and the universities to aid further development of new processes. In the second one the author gives his views on some electrochemical actualities and potentialities.

Transaction of Russian Scientific Periodicals

The Council of Scientific and Industrial Research, India has entered into an agreement with the International Publishing House, Moscow for undertaking cover-to-cover translation of Russian scientific periodicals. India is the fourth country to get through such collaboration, the others being U.S.A., U.K. and Israel.– CSIR News, Vol. 19, No. 18, 152, 1969.

New Alloying Process by International Nickel

A new metallurgical process, known as "mechanical alloying" is being developed at the research laboratories of the International Nickel Co., Sterling Forest, N.Y., U.S.A. It is a high-energy process that produces homogeneous composite particles with an intimately dispersed, uniform structure. This unique method makes possible the production of superalloys, nickel-based, with a markedly superior combination of intermediate and elevated temperature properties. — Press Information, International Nickel (India) P. Ltd., E. 43, October 1969.

Plastics for Engineers

The ten papers presented at the Course on "Plastics for Engineers" (IE, India and ECS of India, Bangalore, June 1968; this Journal Vol. 17, 94, 1968) have been published in the Journal of the Institution of Engineers (India), Vol. 49, Pt. GE 3, 119-165 and Vol. 50, Pt. GE 1, 1-57, 1969.

Black Chromium

Black chromium plate is not an entirely new concept, although only since anti-glare restrictions began bothering the American motor industry has it really began to be taken seriously by platers. There are now at least two useful black chromium plating processes of American origin available to the industry. Both in the U.K. and the U.S.A. this is slowly taking over from bright chromium for at least a few decorative uses, and it is expected to spread to much wider applications than required by the motor industry. Indeed it is a highly attractive finish which blends particularly well with bright surfaces and opens the way to a new range of designs for plated decorative parts. The black chromium plate appears to behave at least as well under corrosive conditions as the bright. Moreover at least in one case it has been found that the deposit has the same discontinuous coating structure as micro-cracked and microporous chromium with very similar corrosion properties. Nor should it be significantly more difficult to apply than bright chromium. Black chromium will be a welcome addition to the platers's pallett. — Electroplating and Metal Finishing, Vol. 22, No. 6, 40; No. 7, 36, 1969.

Ultra-pure Aluminium

Extremely high-purity aluminium has been produced in very limited quantities in the U.S.A. with a resistivity ratio of 45,000 compared with 20,000 for currently available purest metal. Since this is an extremely good conductor of electricity, there are potential applications in large cryogenic magnetic devices such as accelerators and m.h.d. magnets where superconductors may not be economically feasible. The material was produced by the very hazardous aluminium triethylene electrolytic reduction process and then zone-refining. It is also under consideration as a reference standard because it has, for example, the most sharply defined superconducting transition temperature known. — Science and Engineering, Vol. 22, 144, 1969.

— T.L.R.