SOCIETY REPORT

Meetings :

The Seventh Annual General Body Meeting of the Society was held on July 30, 1970 at the Indian Institute of Science, Bangalore. The Annual Report for 1969 was presented, and the Audited Statement and Accounts and Balance Sheet as at December 31, 1969 were adopted. The following were elected to the Council for 1970–71 : (1) Dr. A. N. Kappanna (President), (2) Mr. B. K. Balu (Vice–President), (3) Dr. S. Krishnamurthy (Secretary–Treasurer), (4) Dr. T.L. Rama Char (Editor,Journal), (5) Dr. S. Soundarajan, (6) Dr. K. I. Vasu, (7) Mr. R. A. Shah, (8) Mr. A. K. Bose and (9) Mr. S. Ramaswamy.

The Third Meeting of the Governing Council of the Society was held on July 31, 1970 at the Indian Institute of Science. The following Editorial Board was constituted for 1970–71 : (1) Dr. A. N. Kappanna, (2) Mr. B. K. Balu, (3) Dr. S. Krishnamurthy, (4) Dr. T. L. Rama Char, (5) Dr. K. I. Vasu, (6) Dr. A. K. N. Reddy and (7) Mr. A. K. Bose.

GENERAL NOTES

Heat Exchangers

Australian Chemical Engineering, May 1970 is a Special issue on "Heat Exchangers for the Chemical Industry", and contains the following six articles : (1) Exotic materials for heat exchangers, (2) Compact heat exchangers for the chemical industry, (3) Evaluating plate heat exchangers, (4) Compact heat exchangers, (5) The advent of standard heat exchangers in Australia and (6) A revolutionary heat exchanger.

Instrumentation

There are seven articles of interest on the above topic in the May 1970 issue of Physics Bulletin : (1) The rise of scientific instruments,(2) The proliferation of electronics, (3) Computers and digital measurement, (4) Developments in nuclear instrumentation, (5) Medical instrumentation, (6) Adjustment of telescopes and (7) Sound and vibration research.

Metal Finishing

A series of articles in Metal Finishing Journal, May 1970 survey various aspects of the art and science of metal finishing : (i) Polishing : techniques and costs, (2) Electroplating – its present position and future prospects, (3) Trends in organic finishing, (4) Prevention of steel corrosion : the case for galvanizing and (5) Electrodeposition of paints.

"You" Magazine (Your Job and Your Future)

A new Journal with the above title has been issued from New Delhi, The first number, Volume 1, No. 1, April–June 1970 contains many interesting features : the editorial, employment market trends, engineering, non–technical and miscellaneous. Lists of recruiting companies and consultants are included. The annual subscription is Rs. 20, and correspondence may be addressed to C–234, Greater Kailash, New Delhi–48.

Plastics

There are three articles of interest on Plastics in the June 1970 issue of "Chemistry in Britain : (1) High temperature resistant organic polymers, (2) Plastics in packaging and (3) Plastics as engineering materials.

Technology in the Seventies

A two–day Symposium on the above topic was organized by the Council of Scientific and Industrial Research during July 1970 in New Delhi. Besides a session devoted to "Technological Policy in the Seventies", there were discussions in three more sessions on problems, policies and trends of development in the following areas : electronics and communication, chemicals and petrochemicals, and metallurgy and heavy engineering.

Recent Advances in the Plastic Industry

The Bombay Regional Office of Indian Chemical Manufacturers Association held a one – day

lecture series on the above subject during September 1970 at Bombay. The papers presented were: (1) New plastics – trends in research and development of new plastics, (2) The compounding of plastics, (3) New application of plastic materials and (4) New techniques in processing and fabrication with plastics.

Zinc in Cars

Zn 75 is a prototype car designed to demonstrate present and future applications of zinc in automobile manufacture. It was developed for the International Lead Zinc Research Organization. At present an average British car contains about 30 lbs. of zinc, mostly in the form of die castings. The present model incorporates many decorative items in zinc or zinc alloy,and the metal offers considerable scope to the designer.The car is on display in the U.S.A. and U.K., and will move to Australia, Japan and Europe. – Anti – Corrosion Methods and Materials, Vol. 17, No. 6, 23, 1970.

The Mossbauer Effect

Physics Bulletin, June 1970 is a special issue containing the following articles: (1) Introduction; (2–5) Application to diffusion phenomena and molecular dynamics, biological molecules, metallurgy and relativity; (6) Chemical applications.

IMF Conference

The 1970 Annual Conference of the Institute of Metal Finishing, London was held in Torquay during May. The technical sessions covered nickel and chromium plating, plating on plastics, engineering coatings, aluminium, organic finishing, precious metal platings, plating for electronics, alloy deposition, effluents and miscellaneous. Abstracts of the 32 papers can be found in Metal Finishing, July 1970.

Water and Effluent Treatment

Eight articles on the above topic have been published in a special issue of Australian Chemical Engineering, June 1970: (1) The chlorination of industrial cooling water, (2) Effluent treatment using air flotation, (3) Aluminium sulphate for water and effluent treatment, (4) Plastics for pollution control, (5) Dewatering of sewage sludge, (6) Water treatment benefits from Australian aid in South Vietnam, (7) Underground effluent pipes and shaft linings in high density polyethylene and (8) Packaged wastewater treatment plants for small communities, industries, institutions and camps.

Engineers' Day – Symposium on Aluminium and Its Alloys

The Third All India Engineers' Day was celebrated for 5 days from September 14, 1970 by the Mysore Centre, Institute of Engineers (India) at Bangalore. It was inaugurated with the unveiling of the statue of the late Bharata Ratna M. Visvesvaraya by the President of India, a function jointly organized with the Corporation of the City of Bangalore. This was followed by a special feature on "Unemployment among engineers". There was a special meeting on the third day with "Engineers and Nation Building" as the theme.

A two – day Symposium on "Aluminium and Its Alloys" was held jointly with the Electrochemical Society of India on September 17 and 18, 1970. It was inaugurated by Air Vice Marshal A. S. Rikhy, Managing Director, Hindustan Aeronautics Ltd, Bangalore Division. Thirteen papers were presented in 3 sessions: **I–General:** (1) Metallurgy of Aluminium–the Science, Technology and Industry, by (Miss) V. Vasantasree, Imperial College, London; **II – Applications and Properties:** (2) Aluminium Alloys and Their Applications, by J. Balachandra, Bhabha Atomic Research Centre, Trombay, (3) Aluminium– Magnesium Alloys– Some Observations on Their Properties and Behaviour, by K. I. Vasu, I.I.Sc., Bangalore, (4) Aluminium – Zinc Alloys– Thermodynamic Aspects in Application, by K. P. Abraham and M. Mohan Rao,I.I.Sc., (5) Application in Telecommunication Industry, by S. Krishnamurthy, ITI, Bangalore, (6) Aluminium and Import Substitution, by K. Srinivasa Rao, Bangalore, (7) Aluminium Magnet Wires (Substitution of Copper by Aluminium), by A. P. Mehta, Deepak Insulated Cables Corporation Ltd, Bangalore, (8) Application in Battery Industry, by K. I. Vasu, (9)Aluminium for Flexible Cables, by P. K. Krishnan Nair, Aluminium Industries Ltd, Kundara, (10) Application in Furniture Industry, by Gopal Ramnarayan, Featherlite Corporation, Bangalore; **III–Protection and Metal Finishing:** (11) Aluminium in Corrosion Prevention by Cathodic Protec-

tion, by R. P. Dambal and T. L. Rama Char, I.I.Sc., (12) Electroplating on Aluminium : Recent Developments, 1967-69, by R. Sivakumar and T. L. Rama Char, (13) Recent developments in Hard Anodizing, 1966-1969, by S. K. Narang and T. L. Rama Char.

The participants numbered about 100 and were drawn from the industries and academic institutions. The discussions were very interesting, and provided an excellent opportunity for intimate contacts between scientists and technologists with common interests. There was an exhibition of aluminium products. It is planned to publish the proceedings.

New Aluminium Metallizing Process

A potential method, competitive with vacuum metallizing, has appeared for the electroless deposition of bright aluminium coatings. A non-aqueous solvated aluminium – hydrine solution is decomposed by a titanium tetrachloride catalyst, in an oven at 100°C in a dry nitrogen atmosphere, and is virtually instantaneous. The tetrachloride can be applied in the vapour phase, or in the form of a non-aqueous solution, and the aluminium hydride by immersion or roller-coating. The Dow chemical process has the advantages of requiring relatively simple plant, and having good penetrative properties, and the ability to cover complex-shaped surfaces uniformly. The coating, which is only about half a micron thick, is considered to have many potential uses in the electronic, decorative, packaging and other fields. – Metal Finishing Journal, Vol. 16, 167, 1970.

Materials in the News

A new Advisory Council on Materials has been formed to advise the Minister of Technology and Secretary of State for Defence in the U. K. Materials constitute about a quarter of the value of manufactured products and a third of the country's import bill, and about a fifth of the total qualified staff of the Mintech industrial R and D establishments are working in the materials field. There will be 7 standing committees dealing with ferrous, non-ferrous, organic, inorganic non-metallic and composite materials; forming and fabrication, including welding and powder metallurgy; deterioration, including corrosion and protection.

In the U. S. A., a Conference on "National Materials Policy" was held at New England College, Henniker, N. H., during July 1970. It dealt with the history, status and prospects for the maintenance of a national set of consistent policies and instruments of Government in the field of materials. The contributions covered the decline of the materials professions in the country, prospects for interdisciplinary laboratories, role of the professional and learned societies in the evolution of a national materials policy. Sociological problems are also to be reviewed, notably the relationship between materials conservation and preservation of the environment, recycling of materials, and the development of new uses for waste products.

A Seminar on "Trends in Engineering Materials in the 1970s" was organized by the International Research and Development Co. Ltd. at London during April 1970. The sessions covered developments in materials and requirements of large users of engineering materials. During the discussions there was a strong feeling that, while the industry needed new materials, the efforts to develop them should not be undertaken without a full appreciation of the equally important need to improve the reliability and utilization of existing materials. There was also an emphasis on the importance of reducing the number and complexity of existing material specifications, and the desirability of attempting to introduce into them a reliability factor of some sort.

The factors restricting the wider use of copper and its alloys in chemical plant have been recently discussed. The conclusion is that they continue to have attractions in a variety of duties in the chemical industry, but are handicapped by being inherently more costly, having higher cost ratings for design stress, and being more costly to fabricate than many other materials. – Metals and Materials, Vol. 4, 209, 213, 251, 1970.

A three-day course on cobalt and its alloys is scheduled for December 1970 at the Los Angeles campus of the University of California. It is

intended for designers and engineers in various fields. The outline is: introduction – economics – supply and resources; engineering properties; physical metallurgy; superalloys – cutting, wear and hardfacing; magnetic materials; research and development; iron-base cobalt-containing alloys (high-speed steels, maraging etc.), including new developments – cemented carbides; industrial coatings: electroless, electroplated etc; Al-, Cu-, Ni-, Ti-base alloys containing cobalt.

Ultrasonics

Science Today, September 1970 contains an article entitled "The World of Silent Sound" describing in detail the many uses of ultrasonics. It has been pointed out at the outset that, from submarine detection from the First World War to the present spotting of microstones in the kidney, the rapidly expanding world of ultrasonics has brought about many wonders in industrial and therapeutic fields. Today it helps detect minute flaws in metals, drill hard materials, clean delicate industrial equipment and has even given "sight" to the blind. The applications have been illustrated elaborately in many areas, and also listed: non-destructive testing, industrial and archaeological cleaning using cavitation, welding of plastics and metals for assisting in electroplating, machining of fragile and hard materials soldering and brazing, medicine etc.

Italian Standards – Essay on Standardization

On the occasion of its 50th anniversary celebrations, the national standards body of Italy, Ente Nazionale Italiano di Unificazione, is organizing an international essay competition on standardization, rationalization and unification. The object is to bring forth in a detailed manner the fundamental importance of standardization in industrial and technical development.

Corrosion/71

The National Association of Corrosion Engineers has sponsored Corrosion/71 during March 1971 at Chicago. This is an international forum devoted exclusively to the protection and performance of materials in corrosive environments. The programme includes technical symposia, Corrosion Research Conference, technical committee meetings, educational lectures, and Materials Engineering and Corrosion Show.

NDT–1970 Conference and Exhibition

The Non-Destructive Testing Association of Australia held a Conference and Exhibition during August 1970. Fourteen papers were contributed in six technical sessions on various aspects of non-destructive testing: aircraft maintenance, television, colour and industrial radiography, nuclear power reactors, reactor pressure vessels, ultrasonic testing, thermography, holography, boiler manufacture and miscellaneous.

Corrosion Congress

The Fifth International Congress on Metallic Corrosion will be held during May 1972 in Tokyo. A wide range of topics will be discussed under the following headings: (a) Fundamental problems of corrosion processes, (b) Engineering problems on the protection of metals against corrosion, (c) Case histories and experiences of corrosion in practice and (d) Miscellaneous. Correspondence may be addressed to Dr. G. Ito, 2-3-12 Nakameguro. Meguro-ku, Tokyo.

Surface Coatings

There are seven articles of interest on "Surface Coatings for Corrosion Prevention in Australasian Corrosion Engineering, July 1970: (1) Waterborne systems for industrial maintenance, (2) The role of protective coatings in the mineral industry, (3) Anti-corrosive primers for present requirements, (4) Limitations of zinc coatings for off-shore structures, (5) Protecting an important industry, (6) Mechanical blasting and protective coating and (7) Fabrication of pre – finished galvanized steel.

The Pollution Problem

This Journal had recently occasion to discuss ecology, pollution and related topics (Editorial, Volume 19, July 1970). It has now been pointed out (Soviet Land, Vol. 23, No. 18, 2, 1970) that serious threats lie in store for the globe, which will violate its harmonious contacts with the surrounding medium.

Several striking illustrations have been cited: (a) A single Boeing jet plane burns 35 tons of oxygen in a flight from Paris to New York; (b) In the last century, 240,000 million tons of oxygen were burnt in furnaces and 360,000 million tons of carbon dioxide were discharged into the air; (c) The supplies of fresh water on the globe are decreasing every year, and there is a definite danger arising also from the artificial pollution of the medium in which we live; (d) A London traffic policeman inhales during a day as much gas as if he had smoked 100 cigarettes, and in wet weather in Chicago nylon stockings ravel out due to the action of poisons soaked in water; (e) Over the last 100 years, 1.35 million tons of flint, 1.5 million tons of arsenic, over 1 million tons of nickel, 900,000 tons of cobalt, 600,000 tons of zinc and 600,000 tons of antimony – all extremely poisonous substances – have got into the atmosphere; (f) US industry uses more oxygen than can be supplied by the country's vegetation, and consequently this country depends for oxygen on the rest of the people of the world; (g) A car which has run 1,000 km has used one man's yearly oxygen ration, and each ton of burnt coal "takes away" oxygen from ten men.

A new lead-free petrol went on sale across the U. S. A. for the first time during October 1970, marking a significant success for the anti-pollution campaign (Indian Express, Bangalore, page 7, October 5, 1970).

A report comes from the U. K. that, as cities control their smoke and scrub off their grime, people are enjoying a healthier and more comfortable way of life (Reader's Digest, Indian Edition, Vol. 97, No. 581, 166, 1970). During the last ten years industry has spent £ 300 million on controlling air pollution due to smoke. It would take only £ 100 million to solve the last of the smoke problem. Once that is done, the country can begin to tackle the other forms of air pollution: sulphur dioxide from industry, and the fumes from car exhausts. The success with controlling coal smoke shows that air pollution can be beaten. In terms of the overwhelming benefits to the people and increased efficiency, the price for clean air is cheap.

There is a supplement on Pollution in OSU Research Review, May–June 1970 covering various facets of the subject: population and environment as analyzed by ecology, course in ecology, soil pollution, sonic boom simulator, chemical processes for water and waste treatment, pollution control equipment, industrial noise problems, and a list of 27 environmental projects.

The World Health Organization is setting up an international network to study air pollution in various parts of the world. It will consist of two international centres in London and Washington, and three regional centres in Moscow, Tokyo and Nagpur, together with 20 other laboratories around the world. The main purpose will be to supply to the WHO information on levels of air pollution caused by sulphur dioxide and suspended dust particles.

The equipment, services, materials and research available to fight the growing menace of environmental pollution will be featured in the Environmental Pollution Control Exhibition at London during March–April 1971.

Operation, Maintenance. Design and Manufacturing of Chemical Plants and Equipment in Developing Countries

Konigstein (Taunus), West Germany was the venue for the UNIDO/DECHEMA Seminar on the above topic held during June 1970. The proceedings (preliminary report), covering 11 pages presented therein, have been published in Chemical Age of India, September 1970.

Electric Automobile

The Copper Development Association, London presented, about ten months ago, a prototype of what may be the first practical electric automobile. The all-purpose chassis, said to be technically and economically ready, was designed to reduce urban air pollution (See notes on the pollution problem given above in this issue). It is driven by a 20 hp electric motor fed by a sealed 30 kwh lead-cobalt battery system. The latter is a modified lead-cobalt cell with cobaltous sulphate added to the electrolyte. The tri-polar system, which can be recharged to 80 per cent of full capacity in 45 minutes or less, has twice the energy-to-weight ratio of conventional lead-acid batteries. Such recharges are equivalent to 150 miles of operation at a cruising speed of of 40 mph. – Cobalt, No. 47, 1970.

Black Chromium

Recent trends in design both in home and office have led to an increasing interest in the use of black finishes on metal parts. Similar requirements have been noted in automotive design, both from a styling point of view and for anti-glare applications. Black chromium is worth considering from the viewpoint of greater durability. In a newer proprietary type, the throwing power and process control is much improved and the finish achievable has an unusual subdued metallic lustre. The process is operated at 65–85°F and 100–400 asf for 3–10 minutes, the common base being bright or satin nickel. The coatings thus produced have the following properties: colour fastness, thermal stability, low reflectivity, reasonable wear and excellent corrosion resistance, and excellent paint adhesion. It is concluded that here is a most attractive metallic finish with wide applications. – Monthly Newsletter, Australasian Institute of Metal Finishing, 2, August 1970.

Chemical Revolution in Metallurgy

Indian Chemical Engineer, January 1970 contains an informative article with the above title. The Technological revolution that has been taking place in metallurgy has been discussed with special reference to nickel – supply and demand, consumption and processes. Chemical metallurgy of copper has been touched upon, followed by the future of metals. It has been pointed out that the future growth in metal consumption will depend not only on the world material progress, but also on the competition from plastics. The current world production of non-ferrous metals is of the order of 23 million tons per year, whereas the consumption of plastics exceed 20 million tons in 1968. By 1980 plastics production is estimated to rise to 100 million tons per year, the same order of magnitude as the steel production today. In India, there will be a large gap between demand and production of non-ferrous metals, and actual consumption will depend on the imports.

It is concluded that it is very difficult to predict where newer applications of the principles of physical chemistry and chemical engineering to extractive metallurgy will lead us to. It is, however, probably safe to say that chemical process principles will be applied more and more to the production of alloys, metal – ceramic and metal - plastic composites which will constitute the materials of tomorrow.

—T. L. R.