NEWS SECTION

SOCIETY REPORT

Meetings:

A Technical Meeting of the Society was held on 4th August 1964 at 5 p.m. in the Conference Hall of Indian Standards Institution, Bombay. Dr. K. S. G. Doss, Director, Central Electrochemical Research Institute, Karaikudi, presided. Shri P. N. Gandhi, Director, The Nickel Information Bureau (P) Ltd., Bombay, gave a talk on "Recent Developments in Nickel Plating".

The Chairman introduced the speaker and said that the techniques in nickel plating were developing fast, and such discourses periodically would give an idea of the advance made in the subject. Recent developments in nickel plating, said Shri Gandhi, can be broadly divided into three major headings, viz., "Introduction of Titanium Baskets", "New Technique of Nickel Plating" and "High Speed Nickel Plating". Quoting Mr. Wallbank of Ionic Plating in U.K., the speaker said that "the introduction of titanium baskets has been the most important advance in nickel plating since bright nickel was introduced". The basket anodes system had created a stir in the plating world. Titanium baskets were used to hold primary nickel in the form of pellets in the nickel bath, and this had introduced considerable economy in plating by eliminating scrap. This anode with primary nickel provided constant anode area, in contrast to the commercial anodes, keeping the anode current density constant. Further, addition of anodes could be done by topping up the baskets with primary nickel. Though the initial cost of titanium basket was high, the basket would last indefinitely and recurring expenditure was almost nil. Since pure nickel pellets were suitable only for nickel bath operating at a pH of 4.5 or below, the International Nickel Company (Mond) Ltd., had introduced 'S' Nickel containing 0.05% of sulphur. The introduction of 'S' Nickel in the form of squares or sheets had almost displaced depolarised anodes in some countries. The sludge formation in 'S' Nickel was considerably negligible. The solubility of anodes in high chloride, high sulphate or even in chloride free or sulphamate baths was excellent. There was no danger of contamination of the bath for sulphur. Efficiency of the anode ('S' Nickel) was 100%, and maintained a low potential regardless of chloride content and was active upto 400 a.s.f. and upto a pH of 5.5. Thus there was no limitation in the use of 'S' Nickel in titanium basket.

Talking about the new plating techniques developed over the past decade or so, the speaker touched upon Duplex Nickel consisting of sulphur-free, semi bright nickel, and superimposed sulphur containing fully bright layer. The sulphur containing deposit had a tendency to corrode preferentially and thus delayed the penetration of semi-bright layer. The system of Duplex Nickel or Duplex Nickel Chrome was used on automobile parts exposed to severe atmosphere. Further development was the introduction of triple layer nickel consisting of a thin high sulphur nickel layer (0.2% of sulphur) sandwiched between two layers of Duplex Nickel. The middle layer, being less noble than the deposits on either side, confined corrosion damage to itself as well as protected the brightness of the top layer against pitting. The high sulphur layer was applied as a strike deposit. To improve further the corrosion resistance of the nickel, the top layer was normally plated with crack-free chromium or micro crack chromium, depending on the lower layer of nickel. The latest development in nickel plating was introduction of satin nickel finish produced by including non-metallic particles like barium sulphate (about 1 to 2%). The particles were kept under suspension and helped to produce a matte or satin finish. The microporosity produced on the deposit reduced the current density at corrosion centres, and penetration of corrosion to the basis layer was slowed down. This was analogous to the behaviour of micro-crack chromium. An extension of this process had been made recently to produce bright satin nickel under the same conditions. This process, called 'Nickel Seal' in U.K. and 'Dur-Ni' in U.S., was claimed to stop corrosion of steel on nickel and to be superior to the normal bright nickel chrome. Further improvement in corrosion resistance was possible by using 'Ni Seal' in conjunction with double layer or triple layer of nickel.

Talking of High Speed Plating the speaker said that a nickel solution 'Ni-Speed' had just been introduced which might be operated at a current density of 400 a.s.f. depositing nearly 0.020 in. of nickel per hour. The solution is based on nickel sulphamate, and with the addition of organic agents it was reported that the mirror bright deposit could be obtained at current density as high as 300 to 350 a.s.f. Further even at 200 a.s.f. the solution yielded deposits which were stress-free and the solution was highly suitable for electroforming.

The meeting terminated with an interesting discussion and a vote of thanks proposed by the Secretary.

The First Annual General Body Meeting of the Society was held on 27th August 1964 in the Indian Institute of Science, Bangalore, with Dr. A. N. Kappanna in the Chair. The Minutes of the Meeting held on 28th March 1963 were confirmed. Dr. S. Krishnamurthy, Secretary-Treasurer, presented the Annual Report for April 1963 — December 1963 covering the formation of the Society, office-bearers, registration, meetings, Journal, assets and liabilities, auditing of accounts and membership. The Report together with the Audited Accounts and Balance Sheet of the Society for 1963 were adopted. Matters concerning the strengthening of the Society activities were then discussed, and the Meeting ended with a vote of thanks to the Chair.

New Members

Members:

S. P. Saha, A. Singh, P. K. Som (transfer).

Associate Members:

N. Rajamony.

Personals:

T. L. Rama Char has been elected as a Member of the Royal Society of Health, London.

S. S. Misra, on completion of his doctoral work at the Indian Institute of Science, has left for the USA to take up an assignment at the US Atomic Energy Commission, Oak Ridge, Tenn.

S. Venkatachalam is now in Canada for post-doctoral work at the McGill University, Montreal.

GENERAL NOTES

Corrosion Conference in India

The Annual Conference on Corrosion was held from July 20 to 22, 1964, at the Indian Institute of Science, Bangalore, under the auspices of the Metals Committee, CSIR. After the Chairman's speech there was a talk on 'Corrosion in Railways'. This was followed by a general meeting to discuss the present status of corrosion activities and plans for the future. The programme included the screening of the film "Corrosion in Action". The specific problems relating to various aspects of corrosion were discussed in detail at the meetings of the following committees: (1) Development of Corrosion resistant metals and alloys, (2) Industrial corrosion and service failures, (3) Underground and subsoil corrosion, (4) Corrosion in the chemical industry, (5) Atmospheric corrosion, (6) Methods of testing, (7) Fundamentals of corrosion studies, (8) Marine corrosion, (9) Inorganic and organic coatings and (10) Inhibitors, cathodic protection etc.

Corrosion Control in the USSR

From a recent article 'Science against corrosion' published in Moscow it is found that the USSR has planned to increase theoretical work in the struggle against corrosion in the Institute of Physical Chemistry of the Academy of Sciences. The increased support will be returned many times through practical advances which will succeed in overcoming the ravages of corrosion. It is estimated that corrosion research is now supported in Russia at a level of 0.1 per cent of the over-all loss to the country. Rough calculations show that 10 to 12 per cent of extracted metal is lost because of dissipation by corrosion. The losses in Russia from corrosion of ferrous metals amount to about 8 million tons per year. It is concluded that the fight against metallic corrosion is just as necessary for the development of human society as is concern for national health and perfection of medicine science.—Materials Protection, Vol. 3, No. 5, 41, 1964.

Water Desalination

The United Nations Department of Economic and Social Affairs has prepared a 325-page report "Water Desalination in Developing Countries" based on a survey carried out in 43 countries in 1961 and 1962. It states that an anticipated increase in the per person income in developing areas would improve the prospects of placing relatively high cost desalinated

water within the reach of users. Present processes involve either the extraction of fresh water from salty solutions mostly by distillation, or the removal of salts from water by electro-dialysis or freezing. The largest new plant at Curacao, Netherlands, Antilles, has an installed daily capacity of 12,000 cubic metres.

The report advises that in countries where low-cost energy is available, the electro-dialysis process should be preferred. It also draws attention to the feasibility of establishing dual-purpose plants which produce both electric power and desalinated water. The conversion cost for saline water has been reduced during the last 5 years to a range of $0.25 to 0.34 per cubic metre. Nuclear power could be utilized for desalination only if, in the modest quantities needed for the plants in under-developed areas, such power could be produced at relatively low cost.—UN Weekly Newsletter, Vol. 12, No. 29, 1, 1964.

Porous Cobalt Electrodeposits

A method for producing porous cobalt electrodeposits has recently been described by Russian investigators. It is based on the addition to the cobalt sulphate bath of colloidal graphite, which is embedded in the deposit and is subsequently removed by burning. The cobalt deposits obtained in this way, which were intended for use as catalysts, presented a porosity of 6.5 per cent by volume, while the internal surface of the pores was about 1700 times the surface area of the specimen.—Zhur Prikład Khim, Vol. 36, 1461, 1963.

Calcium Carbide Technology in Japan

Japan has attained the world's first position in the production of calcium carbide, nearly one-fifth of the total of 8 million tons. Several factors have enhanced the production technique: adoption of large size closed electric furnaces, high standardization and the increased consumption of by-products such as vinyl chloride and acetate. There are various problems facing the industry especially in face of the advances being made by the petrochemical industry. However, it is endeavouring to keep production costs at a minimum and intends to lower the cost of carbide acetylene to 7.5 cents per lb in order to meet the international standard price of ethylene at 5 cents per lb.—Chem. Age of India, Vol. 15, 784, 1964.

Hydrofluoric Plant in India

India's entire requirements of hydrofluoric acid and fluorine compounds are currently made by imports. This includes about 75 tonnes per year of technical grade hydrofluoric acid and 1-2 tonnes per year of analytical reagent and chemically pure acids. In addition several hundred tonnes of fluoride are imported every year. The National Fluorine Corporation at Majiwada, Thana, has succeeded in producing hydrofluoric acid for the first time in a pilot plant with a capacity of 500 lb/day of 50 per cent or 416 lb/day of 60 per cent acid. In this process 300 acid grade mesh imported fluorspar containing 98 per cent calcium fluoride — with a silicon content 1 per cent, is reacted with excess of 98 per cent sulphuric acid, in a retort at 250C for several hours with thorough mixing.—Research and Industry, Vol. 9, 125, 1964.

Metal Industries in ECAFE Region

Recommendations aimed at stimulating iron and steel manufacture and other metallurgical industries in Asia haae been made by the Sub-Committee on Metals and Engineering of the ECAFE: (1) that the organization study and actively promote the establishment of integrated, joint projects for the manufacture of iron and steel in the Republic of China, India and Thailand using raw materials from more than one country, (2) that in view of the acute shortage of scrap iron in Asia, a study be made of the feasibility of a pilot plant producing sponge iron, using natural gas, and (3) that a regional metallurgical institute for non-ferrous metals be set up.—UN Weekly Newsletter, Vol. 12, No. 30, 3, 1964.

Analytical Reviews — 1964

'Analytical Chemistry' in its April 1964 issue, part one, covers annual reviews on the following topics amongst others: electroanalysis and coulometric analysis, electrophoresis, instrumentation, ion exchange, electron microscopy, polarographic theory-instrumentation-methodology, electrochemical relaxation techniques, organic polarography, amperometric titrations, titrations in nonaqueous solvents and potentiometric titrations. There are comprehensive references at the end of each article.

Mining in the U.S.S.R.

The Soviet mining industry is divided into 4 segments: fuel, ferrous and non-ferrous ores and metals, construction and stone materials, and chemical ores — non-metallic and saline minerals. Reserves of ore, both proven and

niferred, are plotted on an enormous map which also indicates the ratio of Soviet reserves and production compared to the rest of the world. Research covering mining methods, metallurgical processes, exploration methods and equipment design is conducted in 40 research institutes. The main research project currently underway is the automation of mines.—World Mining, Vol. 17, No. 6, 15, 1964.

Corrosion Museum

A museum of documented corrosion failures has been commenced and will be located in large glass display cases in the School of Chemical Engineering, University of N.S.W., Kensington, Australia. The Committee would be pleased to receive items, together with case histories, for inclusion in this display.—Australasion Corrosion Engineering, Vol. 8, No. 6, 35, 1964.

World Mining

The Catalog, Survey and Directory Number of 'World Mining', Vol. 17, No. 7, 1964, is a special issue covering (1) technological advances in 1963 — exploration, mining, beneficiation of ores and metallurgical developments, (2) world mining activities, (3) ore buyers guide and (4) catalog index of mineral industries equipment and manufacturers. The world reserves of iron ore, explored and potential, have been estimated at 29,041 and 42, 129 million metric tons respectively, the corresponding figures for India being 3, 394 and 6,555 million metric tons.

Metallurgy Exhibition

The First European Metallurgy Exhibition was held in Turin from September 19 to 30, 1964, under the sponsorship of the International Technical Exhibition and the Associazione Italiana di Metallurgia. The Exhibition presented a selction of the more advanced technical developments in metals and foundry industries, ferrous and non-ferrous, with special emphasis on raw materials, equipments, plants, control and research instruments, products and applicatiens.

Atomic Energy Conference

The Third UN International Conference on the Peaceful Uses of Atomic Energy took place in Geneva from August 31 to September 9, 1964, Major attention was devoted to nuclear power, nuclear reactions, reactor physics and technology. Ten sessions discussed fuels and materials problems including corrosion and fuel reprocessing. Some papers also covered the possible use of nuclear energy in converting saline water to fresh water. Another group was mainly concerned with the direct conversion of heat to electricity, and numerous applications of atomic energy in research, industry, hydrology, chemistry and medicine. There were about 750 papers from 37 countries and 5 internatonal organizations.

ACHEMA 1964

The 14th Chemical Engineering Exhibition — Congress was held in Frankfurt-am-Main during June 1964 to discuss common problems pertaining to research, literature, works techniques and equipment, pumps and fittings, packing, accident prevention and works safety, chemistry, nuclear science and technology, laboratory techniques, measurement control and automation, and structural materials. The lectures covered the latest advances in Chemical Engineering.

Conference on Petroleum and the Sea

The First International Conference and Exhibition on 'Petroleum and the Sea' has been planned for May 1965 at Monaco. The programme includes a special group No. 12 on Corrosion: cathodic protection, surface treatments, new materials, and special service paints and coatings.

Corrosion Courses in the U.K.

The Department of Metallurgy, Sir John Cass College, London, has arranged for a one-year full-time and two-year part-time course of lectures and practical work leading to a post-graduate diploma in Corrosion Science and Corrosion Engineering commencing from September 1964. It has been devised to give a suitable balance between the theoretical and practical aspects, the topics being: electrochemistry, physical metallurgy and metal physics, oxidation and high temperature corrosion, corrosion in aqueous solutions, metallic and non-metallic coatings, non-metallic materials, corrosion engineering, instrumentation, corrosion testing, miscellaneous.

Atomic Energy

The August 1964 issue of IAEA Bulletin contains 3 papers of special interest: (1) Some topical atomic power questions — present energy and electricity consumption in the world,

world resources of energy and fissile materials, present status; (2) Ten years of nuclear power-introduction, national programmes: U.S.A., USSR, U.K., France, Canada and Sweden, Italy and Japan; (3) Industry benefits from radio-isotopes — basis of survey, some typical cases, economics, massive irradiation, radiography, tracing, future applications.

Electrochemical Industry in Japan

A historical review of the electrochemical industry in Japan has been presented in JECS, Japan, Vol. 31, No. 4, 1963 (English ed) and covers general survey and historical development of main electrochemical processes. Two significant factors, which are somewhat of a handicap to the industry, are the use of electrochemical techniques developed outside and the existence of a large number of small enterprises. Further, there is the urgent need to meet the power shortage by developing new techniques and to make fully rational use of the electric power available. The statistics for 1951-1961 are interesting. Ferro-alloy production shows a phenomenal rise compared with copper, zinc and aluminium. Amongst basic industrial chemicals, ammonia comes first followed by calcium carbide and cyanamide and electrolytic caustic soda.

Aluminium in Batteries

In two papers abstracted in JECS, Japan, No. 4. 1963, the performance of pre-use amalgamated and aluminium — 0.2 per cent indium alloy anodes in a reserve battery has been discussed. The batteries are one-fifth to half the weight and one-fourth to half the size of a Leclanche cell and can generate 2.25 Kwh/Kg.

NACE Corrosion Reports

Reports on 1963 ocrrosion activitis have been published in the June 1964 issue of Materials Protection, and cover Italy, Switzerland, Germany, India, Norway, Holland, South Africa, Spain, Austria, and England. The addresses of the overseas correspondents have also been given for each country.

Corrosion by Fuel Impurities

Detailed abstracts of 12 papers presented at the International Conference on the Mechanism of Corrosion by Fuel Impurities have been given in The Nickel Bulletin, Vol. 37, No 5, 1964. The Proceedings of this Conference have been published by Butterworth & Co. Ltd., London in 1963.

Aluminium in the U S A

Since 1950 aluminium production in the U.S.A. has increased three times as much as total industrial production. The figure for 1963 capacity is about 2.5 million tons per year. Surprisingly, the metal is in second place behind steel in primary metal production. The break figures for consumption are: construction 700,000 tons — 230 pounds per average house, transportation 700,000 tons — 70 pounds average per automobile, consumer durables and electrical equipment 650 million pounds each. Considering the shortage of aluminium during the war some of today's uses of the metal seem almost prodigal. The 1963 use for packaging was 480 million pounds. A ton of foil, of course, will go a long way.—Science and Appliance, Vol. 28 No. 6, 4, 1964.

Non-ferrous Metals in India

The August 10, 1964 issue of The Economic Times, Bombay, carries a special feature on the Non-ferrous Metals Industry. There are several articles of special interest: (1) Romance of Indian non-ferrous metal industry, (2) Non-ferrous utensils industries, (3) Steps for the development of the non-ferrous metals industry, (4) Rising metal prices and their impact on India, (5) Need to popularize the use of aluminium, (6) Lead and zinc in the past decade, (7) Sources, production and uses of nickel, and (8) Smelting of secondary metals to use internal scrap.

Symposium on Protective Coatings

A Symposium on Protective Coatings was held on August 30, 1964, at the Indian Institute of Science, Bangalore, under the joint auspices of the Royal Institute of Chemistry (Deccan Section), The Indian Institute of Chemical Engineers (Bangalore Regional Centre), The Electrochemical Society of India, and The Chemical Engineers' Association (I. I. Sc.). Thirteen papers were contributed under metallic, inorganic and organic coatings, protective coatings for wood, and analysis of coating materials: (1) Electroplating in the aircraft industry by M. K. Thomas, (2) Electrodeposited alloys in protective finishing of metals by S. S Misra and T. L. Rama Char, (3) Recent developments in anti-tarnish treatments for silver by (Miss) V. Vasantasree and T. L. Rama Char, (4) Precious metal plating by S. Krishnamurthy, (5) Tin plate in the food canning industry by G. S. Siddappa, (6) Media and pigments by M. Rajagopalan, (7) Rheology of paints by M.

Someswara Rao, (8) Survey of organic raw materials used in protective coatings by B. H. Iyer, (9) Preservation of foodstuffs against pests through protective coatings by K. Kalyan, (10) Coatings by the fluidised solids by G. N. Bhat, (11) Protective coatings for wood by D. Narayanamurti, (12) Requirements of an ideal protective coating for wood by M. C. Tewari and P. S. Rao, and (13) Spectrophotometry in the analysis of coating materials by T. R. Kasturi.

The Symposium was inaugurated by Prof. S. Dhawan, Director, Indian Institute of Science. There was a detailed discussion for each paper. The Abstracts of the papers have been printed as a booklet, and the sponsors have plans to publish the Proceedings.

Steel plants in India

In order that the Fourth Plan steel target of 18 million tons is achieved, the Government of India may set up two steel plants instead of one during the Plan period. This is said to be necessitated by the fact that against the targeted production only 14 million tons of steel will be available — 5 each from the existing private and public sector plants and 4 from the proposed Bokaro Complex.—The Eastern Metals Review, Vol. 17, 1955, 1964.

Plastics and Synthetic Resins

There are several articles of interest on Plastics and Synthetic Resins in the August 1964 issue of Chemical Age of India: (1) CAI Review of the plastics industry, (2) Development of petrochemicals for the plastics and allied industries, (3) Oil soluable phenolic resins, (4) Alkyds and modified alkyd resins, (5) Chemical intermediates for the plastics and allied industries: 2-pentaerythritol. (6) Sea water and chemical resistance of glass reinfoced ployester laminates, (7) New Developments in polychloroprene rubbers, and (8) Recent trends in plastics technology. This number also contains brief reports on the plastics industry in Japan and the U.K.

Crerar Metals Abstracts

Crerar Metals Abstracts prepared by Research Information Service, The John Crerar Library, Chicago has been terminated with Vol. 12, December 1963 issue. This service will continue to serve the public by way of literature searches, translations, current awareness service and custom abstract bulletins.

Education in Corrosion in the USA

In a paper published in the July 1964 issue of Corrosion, F. L. LaQue has surveyed the extent of education in corrosion in the U.S.A. Current statistics indicate no increase in the extent of education since 1955. Suggestions are offered as to steps which might be taken to correct deficiencies in the fields of education and research in corrosion.

—T.L.R.