NEWS SECTION

SOCIETY REPORT

Meetings

Four Special Lectures in Electrometallurgy were held at Bangalore from November 13 to 16, 1968 at the Mysore Centre, The Institution of Engineers (India) under the sponsorship of the IE (India) and The Electrochemical Society of India. Two lectures on " Electroforming—Principles and Practice " were presented by T. L. Rama Char, (Miss) M. Sarojamma and K. L. Vasanth, and two on " Electrochemical Machining—The Process and The Applications " by T. L. Rama Char and V. K. V. Unni. They will be published in the Journal of the Institution of Engineers (India).

Two lectures on Electrochemical Technology were arranged on December 19, 1968 under the auspices of the ECS of India at the Indian Institute of Science, Bangalore with Prof. N. R. Kuloor in the Chair. (Miss) M. Sarojamma and T. L. Rama Char spoke on " Application of Paint by Electrodeposition ". The authors pointed out that this technique has grown rapidly during the last few years. The principles involved in the process and the procedure were outlined, and the recent developments in the field were then discussed. The salient features of this topic have been covered in detail in the paper " Recent Developments in Electropainting " by the authors (This Journal, Vol. 17, 53, 1968).

S. Krishnamurthy in his talk on " Precious Metal Plating " stated that this process, started with the sole aim as a decorative finish, has made inroads into the field of electroplating for improving corrosion resistance. During the past two decades, there has been a rapid growth of the electrical, electronic, aircraft, missile and allied industries. The application and the use of electroplated precious metal coatings by these industries have been the prime impetus for research and development of precious metal electroplating. The recent advances in the plating pertaining to gold, silver, rhodium, palladium, platinum, ruthenium and iridium were discussed, and the necessity for suitable specification was also stressed. Due to the phenomenal advancement of the design field of electronic and communication equipments, the responsibility on the precious metal plater for producing the reliable deposit has increased tremendously. This paper will be published in JECS of India, April 1969. The session terminated with a vote of thanks to the Chair by the Secretary.

A meeting of the Governing Council of the Society was held on October 17, 1968 at the I. I. Sc., Bangalore.

New Members

Member: S. Ramajayam.

Personals

T. L. Rama Char has been promoted as Professor (Electrochemistry) at the Indian Institute of Science, Bangalore.

S. S. Misra has left Bangalore to join the Central Fuel Research Institute, Dhanbad as Scientist.

GENERAL NOTES

Electrochemical Sensors Symposium

The International Measurement Confederation held a Symposium on Electrochemical Sensors in Veszprem, Hungary during October 1968. Topics discussed were: (1) Theory of ion selective membranes, glass membranes, membrane electrodes; (2) Design problems and new solutions, special-designed glass electrodes, structure of membrane electrodes and (3) Application problems.

Materials Handling in the Chemical Industry

A Symposium on the above subject was held by the Institution of Chemical Engineers, N. S. W. Group in Sydney during June 1968. Four papers presented therein have been published in Australian Chemical Engineering, July and August 1968: (1) Materials handling, (2) Bulk handling in fertilizer manufacture, (3) Materials handling equipment and (4) Bulk handling of raw sugar in Queensland.

Tool Steels

Iron and Steel, special issue 1968 contains a feature on tool steels, pages 53-100. It covers selection and properties, high speed steels, metallurgical, defects and maraging steels, together with suppliers, brand names and classification.

Physical Chemistry in the U.S.S.R.

There are 2 reviews of interest in the Russian Journal of Physical Chemistry, No. 10, 1967: (1) Development of the basic aspects of physical chemistry in the U.S.S.R., and (2) Fifty years of chemical kinetics; with 238 references.

The Development of Steels and Their Uses

The Metals and Metallurgy Trust of the Institute of Metals and the Institution of Metallurgists, London held a residential course on the above subject at Carlisle. The five lectures covered therein have been published in Metals and Materials, July 1968: (1) Recent developments in structural steels, (2) Improved steels for high temperature service, (3) Selection of steels for resistance to brittle fracture, (4) Corrosion resisting steels and (5) Practical implications of good weldability.

Galvanizing

The Bulletin "World-wide Galvanizing" published by the Zinc Development Association, London contains 23 photographs selected from the entries submitted for Intergalva 67 photographic competition. They show how the world's steel users depend on galvanizing for protection, and how varied are the things it protects. Galvanizing takes well over a million tons of zinc a year, each ton protecting more than 10 times its own weight of steel, and giving practical proof of success.

Japanese Steel Industry

The findings of a British Steel Corporation study group which visited Japan in 1968 have been reported in "British Steel", April 1968. The crude steel production is expected to go up to a figure of 80-90 million tons by 1971-72 from 62 million tons in 1967, the increase being roughly equivalent to the output of the entire British steel industry—24 million tons in 1967. Japan has to import 97 per cent of the ore and two-thirds of its coal requirements. The Japanese measure their prosperity by the amount of steel used, and steel is apparent everywhere—on motorways, bridges, buildings, lifts, and even as temporary paving on the streets while work on a new subway goes on underneath. However, the *per caput*. consumption of steel is less than in countries like U.S.A., Sweden and Germany. It is believed that the maximum benefit of the lower production costs permitted by the recent advances in scale and technology can be achieved only at sites specifically designed to take full advantage of the possibilities.

Water Resources Meet

A working group of experts from 19 countries on water resources planning met in Bangkok during August-September 1968 under the auspices of the United Nations ECAFE and OTC. The discussions were centered round the economic, financial and social aspects of water resources planning—with emphasis on procedures applicable to countries of Asia and the Far East, and co-ordination of activities of all agencies concerned with water resources development and related fields.

Foundry and Forge Technology

The Government of India is setting up a National Institute of Foundry and Forge Technology at Ranchi in collaboration with UNESCO. It will train specialists in the subject to meet the future needs of the industry. There are also plans to offer, in the first instance, a refresher course in Pattern Technology and Design.

Fundamental Corrosion Research

A Research Conference on "Fundamental Corrosion Research in Progress" was held as a supplement to the Annual Conference of the National Association of Corrosion Engineers at Cleveland, Ohio. Abstracts of the 61 papers presented can be found in Corrosion, January 1968.

Physics of Liquids

The Institute of Physics and the Physical Society, London has arranged a Conference on the above title at Norwich, England during April 1969. The emphasis will be on the fundamental properties of the simpler liquids and mixtures, and the sessions will cover thermodynamics, including critical phenomena, transport properties, structure of liquids, and dynamics of liquids including molecular dynamics calculations.

Conference on Iron and Steel

The Iron and Steel Institute of Japan is organizing an International Conference on the Science and Technology of Iron and Steel in Tokyo during September 1970. It will cover the physical chemistry of iron—and steelmaking, physical metallurgy, education in metallurgy and other topics.

Aluminium Production Without Bauxite

Poland is on the point of producing 100,000 tons a year of aluminium by a process which does away with bauxite as a raw material. The process for producing the metal oxide, discovered by J. Grzymak, is coupled with the manufacture of high grade cement. In the existing plant at Groszowice, where 40,000 tons of non-bauxite oxide have been produced, costs are still slightly higher than with the traditional methods, but detailed costings for the new aluminium oxide plant at the Nowiny Cement Works give every indication that the price will drop considerably.

The primary materials used are waste carbon shales and brown coal smoke dust. The method utilizes the phenomenon of polymorphous transformation of the beta-calcium orthosilicate to the gama form. The clay-carrying raw material is mixed with limestone and sintered in a rotary cement kiln, to produce a self-decomposing orthosilicate sinter containing calcium aluminates. This is the starting material for further process in producing both aluminium oxide and a high alite content cement. One ton of oxide is produced for every 11 tons of cement. The agglomerate, baked into lumps, decomposes to dust which is then digested in alkali to dissolve the aluminates. After desilocation and decantation the solution of aluminium undergoes carbonisation in tanks to give the metal hydroxide. The latter is finally washed in a rotary filter and calcinated in an oil fired rotary kiln.

The success of the process follows 30 years of research in Poland which has no bauxite resources. The confidence of Polish metallurgists in this method is further supported by the fact that licences to use it are being offered to the world.—Metals and Materials, Vol. 2, No. 8, 232, 1968.

Satinette Nickel

The "Satinette" nickel process, by Cruickshanks Division of Forestal Industries (U.K.) Ltd.—under licence from Henkel International GmbH of Dusseldorf, affords attractive, silk-matt, glare-free coatings. It may be deposited on bright nickel and be chrome plated without intermediate treatment. The addition agents to the conventional plating bath are M.30 and S. 50. The electrolyte must be filtered continuously after cooling, the filtered volume per hour corresponding to the recirculated volume. The operating conditions and the flow sheet for the filtration systems have been given in Industrial Finishing, July 1968.

Fresh Water by Electro-dialysis

Two new electro-dialysis plants for producing fresh water from brackish wells will be supplied to Italy and Netherlands by William Boby & Co., Ltd., U.K. This is an economical method of desalting brackish water containing up to 10,000 ppm of dissolved salts. One of the plants will have a capacity of 237,550 gal/day of water. Treatment reduces the salt content from 2,200 to 300 ppm. The current required to produce one cubic meter of fresh water in 3.6 kwh.—Chemistry in Britain, Vol. 4, 375, 1968.

Corrosion Resistant Plant and Equipment

A Symposium on "Corrosion Resistant Plant and Equipment for the Chemical Industry" was held by the N.S.W. Branch of the Australasian Corrosion Association at Sydney during October 1968. The following papers were presented: (1) Corrosion control by design, (2) Application of plastics for chemical equipment, (3) High duty coatings for chemical industry, (4) Selection of stainless steels for chemical industry and (5) The use of titanium in chemical industry.

Chrome and Gold

Gold has now stretched to the household. The best people seem to be going in for gold-plated bathroom fittings instead of chromium. One firm, however, is now offering gold-plated fittings at the same price as chromium-plated ones, which is a bitter blow to the status seekers. There is some difference of opinion in the trade as to whether thin gold and lacquer is better than thick gold and no lacquer, and to complicate the issue lacquered brass taps are also available. The latter will not cost more than chromium-plated ones either. However, the prize should go to the firm which, after producing a nickel and chromium-plated die-cast article for indoor service for a number of years, decided that the polished and lacquered zinc looked just as good. So they cut out the

plating altogether, although they did not reduce the process.—Metal Finishing, J., Vol. 14, 223, 1968.

Ball Blanket in Anodizing

Many more manufacturers have turned to the use of the ball blankets, not only as a means of solving fume problems in finishing processes, but also for aiding finishing standards (see Metal Finishing, J., 93, March 1967). Recently this has been applied to anodising in order to maintain the bath for sealing the coating at a temperature as near to boiling point as possible. The open 75-gallon tank was insulated by floating a closely packed layer of Allplas balls on the surface of the solution, and the temperature maintained at 100°C. The result is a more uniform anodic finish, together with a reduced power consumption.—Metal Finishing, J., Vol. 14, 239, 1968.

Nickel Shortage

Metal Finishing Journal, July and August 1968, has published the enlarged abstracts together with the discussion of the papers presented on the above topic at the one-day Symposium held in London during March 1968 by the London Branch of the Institute of Metal Finishing.

Zinc in the American Industry

U.S. automobile makers now use galvanized strip for underbody construction, and the tonnage is increasing every year. With a two-year warrenty standards practice and greater attention to safety, the manufacturers have to be sure that their car bodies stand up well the threat of corrosion from the extensive use of salt on the roads in winter By using improved welding techniques and phosphating treatments, they are handling galvanized strip just as easily as black steel. Both are being finished together either in conventional painting or electropainting lines.

The automobile industry in the U.S. uses nearly 0.5 millions tons of zinc a year in the form of die castings and galvanized strip—more than all European manufacturers together. Plated zinc alloy extrusions are now being tried out for car body trim and new casting alloys are available with good properties at high temperatures. Super-plastic zinc alloys that can withstand severe deformation are now reaching the production stage.—Metal Finishing J, Vol. 14, 277, 1968.

Electrical Energy Generation in Space

A dependable and adequate supply of electrical energy is a priority requirement on all spacecraft. An interesting solution offering a high power/weight ratio is a reactor equipped with a thermionic energy coverter, the thermionic elements of which are combined with the reactor fuel elements. This incore system affords the advantage that the reactor can be operated at a relatively low collector temperature thereby eliminating difficult technological problems. Some details in this connection can be found in the Bulletin of the Institution of Engineers (India), Vol. 18, No. 1, 26, 1968.

Rapid Analysis With German Spectrometer

Rapid spectrographic analysis, using photomultiplier tubes—as well as the conventional photographic technique—to "read" the spectrum is the principal feature of a German automatic spectrometer recently introduced in the U.S.A. The Zeiss RSV instrument has been used for sometime in European industry and research. Results are obtained in 3 seconds per element—Scientific Research, Vol. 3, No. 14, 47, 1968.

Adiponitrile Production

The August 1968 issue of British Chemical Engineering contains an article on the commercial electrolytic production of adiponitrile from acrylonitrile. The former is an important intermediate used in nylon manufacture. The flow sheet as well as the cell power—current relationship have been given. The economics of the process is quite good, and the plant has demonstrated its ability to operate at up to 150 per cent of design capacity.

Analytical Chemistry 1968-69 Laboratory Guide

Analytical Chemistry, Volume 40, July 1968, 468 pages, is a special number—a Guide to instruments, equipment and chemicals. There are 7 sections: laboratory supply houses, product classifications, instruments and equipment, chemicals and services, trade names, books and company directory.

Soviet Chemistry

Fifty Years of Chemistry in the U.S.S.R. is featured in 4 articles in Russian Chemical Reviews, No. 11, 1967: (1) Fifty Years of Soviet Chemistry, (2) Fifty Years of development in inorganic chemistry in the Soviet Union, (3) Soviet organic chemistry after 50

years and (4) Fifty Years of Soviet physical chemistry.

Titanium

There are 9 interesting articles on titanium and its alloys in the August 1968 issue of Metals Engineering Quarterly, pages 1-63. They cover physical metallurgy, effect of alpha plus beta, and beta forging, creep, braze alloys, castings, wear and galling characteristics, use in self-lubricating bearings and, corrosion fatigue and stress corrosion cracking.

Super Pyrobite Copper and Superlume Nickel

Albright and Wilson Ltd., Oldbury Division, Metal Finishing Dept, Oldbury, Warley, Wores, England have developed three specialized processes which are used in the finishing of Conway Stewart pens. The Super Pyrobrite copper plating process is used on the pen body because of its speed, excellent covering power and good levelling properties. This is followed by Superlume Nickel to give the brightest, smoothest deposit in the shortest possible time. The result of this combination is a superior finish with maximum efficiency and economy. The functional properties of ductility and heavy wear resistance are as important to the clip of the pen as brilliance, and this is barrel plated with Plusbrite 330 Nickel. The products of Albright and Wilson were on display at the Industrial Finishing and Anti-Corrosion Exhibition, Earls Court, London, June 1968. Further details concerning finishing literature and samples of finished products can be obtained from them.

Trends in Industrial Finishing

"What's ahead in coatings for products finishing?" is the title of an article in Products finishing, August 1968. Changes in application techniques have had a great influence on the development of the paint industry during the last half-century. More and more paint is being applied in the factory rather than in the field, and factory finishing of metal and wood will be a decisive factor in the 70's. The amount of aluminium and steel factory-precoated has increased from 464,000 tons in 1962 to 1,059,000 tons in 1965, and coil coating in the U.S.A. is projected to be a one billion dollar industry by 1970. In the latter, several operations such as cleaning, pretreatment and painting can be simplified and co-ordinated in one department.

In the near future advancing paint technology is expected to supply new coatings at a more rapid pace, the promising materials being silicone-alkyds, silicone-acrylics, silicone-polyesters, polyesters-solvent and water reducible types, and fluorocarbons. It is safe to predict further impetus in the field of water-based finishes, which have probably advanced more rapidly in Europe than in the U.S.A. The advent of electrocoating may be the breakthrough to provide rapid growth of such finishes in the industrial field in the U.S.A., and electrodeposition is the most important application development of the 60's. Another important trend is the tendency towards thinner coatings. Some automotive finishing systems are already tested at 1.5 mils total thickness, and this is considerably less than the seven-coat systems employed a few years ago. The finisher will find that economy in paint may be sacrificed for efficient application of a high-quality material. New substrates will enter the finishing shops. There will certainly be new developments in the now existing systems: electrostatic finishing, radiation curing, fluidized-bed application, and electrocoating.

Some day the paint chemists will come up with a vehicle with a pigment as a part of it. Despite the growing competition from other materials and application methods, the paint finishers can look forward to greater sophistication of the coating media and of the paint application equipment, and to an even greater role of paint finishing in the manufacturing of goods.

Scientific-Technological Revolution

An article entitled "Scientific-Technological Revolution and Certain Contemporary Problems" in Soviet Review, Vol. 5, No. 67, 1968 discussed certain basic trends in the development of contemporary international life under the impact of the revolutionising upheavals in the productive forces of society. It is stated that the most tangible influence on the life of human society is exerted today by changes in the power industry and production of raw materials, in the managerial sphere, in the media of information and communication. The situation has been analyzed in detail with respect to: (1) The "crowded world" of the early space epoch, (2) Military-technological revolution in world politics, (3) Problems of the developing countries and (4) Science as an active political force of our times. It is pointed out that this revolution changes radically the social status and political role of scientists and of all those engaged in scientific work—which becomes a separate branch of social production.

The conclusion is that the problems posed by the modern scientific-technological revolution can be solved fully only on international lines.

Determination of Lead in Steel

Three articles, abstracted in Lead Abstracts, Vol. 8, No. 7, 120, 1968, cover the determination of lead in steel: (1) Determination of lead in steels by atomic absorption, (2) Determination of trace amounts of lead in steels and (3) Determination of lead in steel. Methods applicable for lead contents between 0.0005 and 0.5 per cent are described, and the results on different types of steel are tabulated.

New Alloys

A manganese-copper alloy recently developed in the U.K. is claimed to have mechanical properties similar to those of high tensile brass and specific damping capacity up to 30 per cent more than that of cast iron and over 20 times that of most conventional engineering alloys.

New Zersey Zinc Co., of the U.S.A. has announced a new alloy containing copper 0.6 and titanium 0.14 per cent and the balance zinc, to replace copper and brass in most forming and structural applications at a significant cost savings. It is stronger and harder than conventional zinc and can accept drawing, stamping, coining, spinning and embossing processes. It can be easily welded or soldered. The alloy can be painted or lacquered without difficulty and can resist creep and grain growth. —The Eastern Metals Review, Vol. 21, 961, 1968.

New Water Desalting Material

American researchers are experimenting with a thin membrane of graphitic oxide for water desalting. This acts as a sieve, allowing pure water to pass through while stopping most of the dissolved salt. This is the reverse osmosis which has been in use in the U.S.A. for desalting for several years, but mostly with filters consisting of cellulose acetate membrane. In the grapitic oxide process, the scientists have varied the membrane thickness, pressure on the salt water, and other conditions. Salt rejection of up to 90 per cent was achieved with a thickness of 0.3 micron from salt concentrations ranging up to 40,000 parts per million. At a pressure of 600 pounds/sq. in., flows of 8-10 gallons/sq. ft./day were achieved, with 80 per cent rejection. The percentage of salt filtered out can be increased by making the water alkaline. But this method is not competitive with the most widely used distillation process.—Participant Journal, USAID, New Delhi, 35, October 1968.

Welding

Welding represents the major metal-working process now-a-days, with some 40 per cent of the total world metal output being used in welded structures—from TV towers and bridges to miniature radio parts. Some 1.5 million gas and oil pipes are butt welded in the U.S.S.R. every year. Automatic machines make hundreds of feet arc welding and up to 1,500 spot welds per hour. The U.S.S.R. has become one of the world's major exporters of diverse welding and auxiliary equipment. The problems faced in studies on welding are, however, on the increase. Mathematical descriptions of complex processes are being successfully employed alongside refined methods of physical and chemical testing and investigation of welded metals and seams. In the Arc Welding Institute of the Ukranian Academy of Sciences, Kiev, physicists, chemists, metallurgists, mathematicians and electronics experts work in close co-operation.

It was welding that laid the theoretical foundations and provided the material base for the development of super high-quality metals and alloys by new methods. Such metals are in demand in diverse fields: aviation, machine-tool and instrument manufacture, building, rocketry and drilling. Welding is progressing in leaps and bounds.—Soviet Union No. 11, (224), 18, 1968.

Kota Instrumentation Plant

The Instrumentation Plant of the Government of India at Kota has started production of process control instruments which are used in steel and thermal power projects. The factory expects to sell instruments worth Rs. 80 lakhs during 1968-1969. It is designed to undertake turn-key jobs for steel and thermal projects, and the instrumentation project can also undertake similar assignments for chemical and fertiilzer plants. A cell for indigenous substitution in the plant has succeeded in preparing designs of new products.—Chemical Age of India, Vol. 19, 854, 1968.

Electrolytic Reduction of Nitrogen

An experimental process developed at Stanford University, U.S.A. reduces nitrogen to ammonia at room temperature and atmospheric pressure in an electrolysis medium of titanium tetraisoproxide and aluminium chloride in

1, 2-dimethoxyethane. Electrolysis carried out for 2 days at 90 volts and, initially, 50 milliamperes yields about 10 per cent conversion.—Chemical Age of India, Vol. 19, 856, 1968.

ASTM Corrosion Committee

Committee G-1 on Corrosion of Metals has been organized by the American Society for Testing and Materials to co-ordinate corrosion activities in the Society. Its scope is "the promotion and stimulation of research, the collecting of engineering data, and the development of methods of test and nomenclature relating to the corrosion of metals". Details concerning the organization of the Committee and the Sub-Committees have been given in Australasian Corrosion Engineering, August 1968.

Hydrogen-Oxygen Fuel Cell

A fuel cell measuring only 17.5 x 17.5 x 9 cm. can deliver a current of 100 A at 0.6 V continuously, as per recent demonstration by Research and Development Laboratories, Manchester. It is a low temperature, low-pressure, hydrogen-oxygen unit, with 30 per cent potassium hydroxide electrolyte. Four hydrogen and five oxygen electrodes are interleaved alternately. The cell operates at a constant temperature, normally 60°C, and the electrodes are supplied with oxygen and hydrogen gas at a pressure 4 kN/m² (3 cm. Hg.) above atmosphere via a manifold in the cell lid. A 3.5 cu. ft. capacity cylinder of each gas was estimated to give 30 A for 7 hours. The overall efficiency of the cell is 60 per cent. Batteries of up to 3kw output have been produced.—Wireless World, Vol. 74, 107, May 1968.

Steel Plants Symposium

An India-Latin American Joint Symposium on Steel was held at Jamshedpur during January 1968. The 13 papers presented therein have been published in the Transactions of the Indian Institute of Metals, June 1968, pages 1-119. They cover ores, steelmaking, operation and economics.

Precious Metal Plating Conference

The Sixth Industrial Precious Metal Electroplating Conference was held at the University of Rhode Island, Kingston, R.I., U.S.A. during May 1968. The topics covered job shop precious metal plating and, waste disposal and air pollution. A digest of the papers can be found in Plating, July 1968.

AES Trade Mission to Europe

Members of the American Electroplaters' Society were on tour to England, Holland, Denmark, Sweden, Switzerland and Germany. The July 1968 issue of Plating has published a report on the visits to electroplating, metal finishing and other plants.

Mining Industry Symposium.

A Symposium on "Mining Industry in South India" was held at Bangalore during November 1968 under the auspices of the Institution of Engineers (India)—Mysore and Andhra Pradesh Centres and Neyveli Sub-Centre, and the Geological Society of India, Bangalore. Over fifty papers were contributed in 5 groups: (1) Mining of precious metals, (2) Mining of fuels including coal, lignite and oil, (3) Mining of ferrous minerals, (4) Mining of industrial minerals and (5) Statistical quality control and general topics.

Non-Ferrous Metals Symposium

The National Metallurgical Laboratory, Jamshedpur was the venue of a Symposium on "Recent Developments in Non-ferrous Metals Technology" during December 1968. The technical programme covered 75 papers in 7 sessions: (1) Extraction and beneficiation of bauxite, applications of aluminium; (2) Electrorefining of aluminium—physical and mechanical metallurgy; (3) Nickel, lead and zinc; (4) Copper—electrochemical studies, stress corrosion, tempering characteristics, physical metallurgy; (5) Copper ores—beneficiation, extraction and refining, scrap reclamation; (6) Wolframite, ilmenite, manganes ores, gold ores; zirconium, niobium, tantalum and others; (7) Diverse aspects of non-ferrous metals. There were contributions from the U.S.A., U.K., U.A.R., France and Switzerland. The proceedings will be published.

Electrochemistry Seminar

The Ninth Seminar on Electrochemistry was held at the CECRI, Karaikudi during December 1968. Eight technical sessions covered: (1) Electrode kinetics, electrochemical equilibria and electroanalyses, (2) Solid state electrochemistry, (3) Corrosion, (4) Electrodeposition and metal finishing, (5) Batteries, (6) Electroorganic and -inorganic products, (7) Electrothermics and electrometallurgy and (8) Electrochemical industries and the fourth five-year plan of India. An abstracts booklet of 86 pages has been issued.

ISI Convention

The Indian Standards Institution held the twelfth annual convention at Bhubaneswar during December 1968. The following topics were discussed: technical education, industrial safety, instruments and equipment for science education, jute industry, control and abatement of water pollution, and work study.

Sweden in the World of Mining

The September 1968 issue of World Mining contains many articles of interests on mining in Sweden: geology and mines, improved techniques, engineering and research, equipment from prospecting to refining, mathematical tools, exploration methods and techniques, management problems and directory of firms.

Nuclear Power

Nearly 400 scientists and engineers from 25 countries and 9 international organizations attended a recent Symposium organized by IAEA in Julich, West Germany, to examine the role which advanced designs of gas cooled reactors will fulfil in the much larger nuclear programmes foreseen by 1980 and later. About half of the electricity produced in the world today by nuclear means is generated from gas cooled reactors. By 1975 this proportion will drop because of orders placed for other reactor systems.—UN Weekly Newsletter, Vol. 16, No. 47, 3, 1968.

Ancient Bronzes

X-ray examination of ancient bronzework has revealed details of the artwork which has never been seen before. The bronze antiquities of the Near East have, in general, suffered badly while resting in the Mesopotamian soil which is much more corrosive than, for instance, its Egyptian counterpart The original bronze is frequently almost entirely lost, leaving behind only its corrosion products. A bronze bowl was so corroded that there is no indication of any decoration; the radiogram, however, revealed a complete and elaborate system of decoration. This technique, developed by the British Museum, has been applied to many other bronze bowls and sheets, including the Balawat Gates kept in the Museum. It proved of unexpected interest in disclosing flaws in the metalwork.—New Scientist, Vol. 40, No. 617, 37, 1968.

U. K. Consortium on Chemical Information

Ten Science Societies have formed a U.K. Consortium on Chemical Information: Chemical Society, Royal Society, Royal Institute of Chemistry, Society of Chemical Industry, Faraday Society, Society for Analytical Chemistry, Biochemical Society, Institution of Chemical Engineers, Chemical Industries Association and ASLIB.

ECS Meeting

The Electrochemical Society held the technical meetings at Montreal during October 1968. The sessions covered: battery, corrosion, corrosion-electrodeposition, dielectrics and insulation, electrodeposition, electronics-semiconductors, electrothermics and metallurgy. The August 1968 issue of JECS contains abstracts of the 581 papers presented.

II Chem E Meeting

The 21st Annual session of the Indian Institute of Chemical Engineers was held at Bombay during December 1968. The following were amongst the topics discussed: (1) Automation, instrumentation and process control, (2) Chemical engineering education, (3) Mass transfer, (4) Materials of construction and plant fabrication, (5) Problems in Indian chemical industry, (6) Process development, (7) Reactor design and (8) Thermodynamics.

Technology Forecasting Institute

Gordon and Breach, Science Publishers Inc, announces the formation of the above Institute, a subsidiary located in New York. The purpose is to bring the engineering community up-to-date on the latest information and knowledge available in particular technological fields. TFI will prepare and present seminars and symposia on topics like superconductivity, advanced materials, bio-engineering and lasers.

Electroless Nickel

An electroless nickel bath—"Phonidur" operating at about 50° has been developed in Germany by Klingspor & Co.,Siegen/Westf. It gives a nickel-phosphorus coating, works out economically and is applicable to synthetics, metals, stones and textures of all kinds. The bath is not sensitive and requires no big regeneration unit. The control is limited to pH and temperature, refinement of the dissipated chemicals and occasional filtration. Samples and information sheet are available from the firm.

International Nickel Marine Corrosion Conference

Biarritz in France is the venue for the Marine Corrosion Conference to held in June 1969 by International Nickel in conjunction with the Sea Horse Institute, Harbor Island, U.S.A. Technical sessions will cover corrosion phenomena related to Alloys in Shipbuilding, Ferrous and Non-ferrous Alloys in Marine Engineering, Desalination and Ocean Engineering.

"Making the Ocean a Test Tube" is the title of an illustrated brochure, 26 pages, issued by International Nickel, Development and Research Department, Harbor Island Corrosion Laboratory, Wrightsville, Beach, N.C. It gives an account of the activities of this Laboratory under: study of marine corrosion; where the ocean becomes a test tube; test facilities—wharf structure, marine piling, tests in flowing seawater, corrosion fatigue studies, stress corrosion cracking tests, polarization apparatus, hot sea water testing equipment, the "platanode", corrosion test spool programme, other features, museum, atmospheric test facilities, characterizing the test environments, other research facilities.

Nickel Refinery Project

International Nickel has announced a 4 million pounds modernisation project at the Clydach refinery near Swansea, Wales, U.K. It involves the installation of a second rotary kiln line, together with increased capacity for the production of hydrogen and carbon monoxide—the essential process ingredients. The refinery, which first produced nickel in 1902, is the only one in the world to employ the nickel carbonyl process to refine the metal. In addition to high purity nickel pellets, the plant produces nickel powders, plus nickel and cobalt chemicals.—Press Release D60, December 1968, International Nickel (India) P. Ltd., Bombay.

European Federation of Corrosion

"Mechanism of Corrosion in, and by Salt Melts" is the subject of a Conference to be held in Dusseldorf during April 1969 as the 48th Event of the European Federation of Corrosion.

Electroplating and Metal Finishing—21st Anniversary

On the eve of completion of 21 years by the well known Journal "Electroplating and Metal Finishing", the following articles of interest on the growth of electroplating and metal finishing have appeared in the November 1968 issue: (1) Twentyone years of what?, by G.S.R. Walker, Australia, (2) Progress made in two decades, by T. L. Rama Char, India, (3) The real starting point in progress: 1950, by E. S. Bueno, Spain, (4) Highlights of recent years, by A. Leonard, U.S.A. and (5) Some historical reminiscences and personal observations, by C.R. Draper, Founder and Managing Editor of the Journal till June 1968.

—T.L.R.