News Section

SOCIETY REPORT

Meetings :

A Meeting of the Governing Council was held on January 21, 1971 at the Indian Institute of Science, Bangalore. It was reported that the office of the Society is being shifted to the new premises kindly made available by the Director, Indian Institute of Science in the old Building of the Dept. of Industrial Management. Dr. K. I. Vasu was designated Associate Editor of the Journal. Dr. T. L. Rama Char reported that steps are being taken to arrange a Refresher Course on Metal Finishing jointly with the Mysore Centre, Institution of Engineers (India).

The Second Meeting of the Council was held on February 26, 1971 at the Indian Institute of Science.

New Members :

Member ; V. N. Misra

Associate Member : A. Anantha Rama Iyer, R. B. Guttikar

Sustaining Member : Lumite Industries, Madras.

GENERAL NOTES

Information :

There are six articles on Scientific Information, with special reference to Chemistry in the October, 1970 issue of Chemistry in Britain : (1) Citations in Chemistry, (2) Chemical patents information, (3) UKC IS - the United Kingdom Chemical Information Service, (4) Wiswesser Line-formula notation, (5) Interconversion of Chemical Structure Systems and IUPAC notation and chemical sub-structure searching.

Current Contents Science and Technology :

Indian Documentation Service, Gurgaon, Haryana has launched a new monthly documentation service under the above title, effective January 1971. It will cover Indian Journals on all subjects in Science and Technology.

Vacuum Coatings Conference :

The First International Conference on Vacuum Coatings was held in London during February 1971 under the sponsorship of Industrial Finishing & Surface Coatings. Sixteen papers were contributed in 3 sections : application of basic techniques ; auxiliary techniques ; vacuum coating equipment. The emphasis was on two areas of application : decorative, and functional in electronics. The programme included a workshop section and an exhibition.

Developments in Japan :

Chemical Age of India, November 1970 issue is a special on Japan. There are several articles of interest covering the chemical industry, chemical technology and economic cooperation. The spectacular progress in post-war Japan is well known, and the information contained here in should be of value to developing and developed countries.

Chlorine Economics :

Three articles concerning the above topic have been published in Chemical Age of India, November 1970 - (1) Chlorine industry economics in 1970, (2) Development of the mercury cell - a typical case and (3) The case for dimensionally-stable-anodes for caustic/chlorine mercury cells.

International Scientific Information :

A Conference on International Developments in Scientific Information Services was held at the Royal Society in London during June 1970. It was organized by Aslib in association with the Institute of Physics and the Physical Society, IEE, Library Association and National Computing Centre. The discussion were centred round the pattern of cooperation that already exists and the possibilities for extending this by means of world systems, such as UNISIST. The papers have been published in Aslib Proceedings, August 1970

Laser for Construction :

A portable battery-operated laser has been developed in England. It can project a beam of red light which can be picked up even in sunlight with a simple reflector up to a distance of 0.4 km. It is stated that the laser will be useful for forming an accurate reference line for laying pipes at precise gradieets, constructing tall or long buildings and observing movements in tunnels and mining galleries._ Science Today, Vol. 5, No. 5, 5, 1970.

Seminar on Problems of Research Application :

Scientists from Asia participated in a Siminar on Problems of Transition from Laboratory Research to Industrial Application organized by the Unesco in cooperation with the Government of India at Poona during December 1970. The purpose was to identify the difficulties encountered, the efforts made, and a possible solution to the problems of transferring the results of scientific and applied research to the economic sectors and in particular to develop the inter-relation between university research laboratories and other research establishments and industry.

Seminar on Electrochemistry :

The Central Electrochemical Research Institute, Karaikudi is holding the 12th Seminar on Electrochemistry during November-December 1971.

Insoluble Lead Dioxide Electrodes :

The CECRI, Karaikudi has developed graphite substrate lead dioxide electrodes which can be used as insoluble anodes for the production of inorganic chemicals and in some organic oxidation processes. The process is covered by Indian Patent No. 66195.

Mastech Conference :

The Third Mastech Conference on " Statistical Mechanics and Their Application to Science and Technology " was held at Bangalore during January 1971 under the sponsorship of the CSIR.

Steel With Less Coke :

There is a shortage of coke all over the world for the production of iron in the blast furnace. Compelled by its heavy dependence on Australia for coking coal, Japan has been working on methods to reduce the coke required. The Nippon Steel Corporation now uses 400 kg per ton of pig iron against 500 kg in 1969, and 580 kg by the European and U. S. industry.- Science today, Vol. 5, No. 6, 7, 1970.

The Role of Scientific Research :

The difficulties encountered in the establishment and proper functioning of research centres have been discussed in detail in Science Today, December 1970 with reference to developing countries. It has been stated that, many a time, there is a hold-up due to non-availability of small sums of money needed to buy auxiliaries. The most considerable " quantity versus quality " conflicts relating to R and D activities arise in the two areas or human and material resources. These can be overcome only by a conscious effort on the part of the government and of the researchers to determine and assume their roles in the crisis of development. The scientists, in addition to their specific professional role, have the added responsibility of promoting the establishment of a complete system of interactions between R and D and the social and economic conditions obtaining in the country.

The Report on the Conference convened by the Committee on Science and Technology, Government of India on Science Policy, R & D, Higher Education and Man Power Resources has been published in Chemical Age of India, December 1970, 1049—1076. It includes a Preliminary Report on Implementation of Scientific Policy.

Physics Bulletin, November 1970 contains an article on " Planning for India's Scientific Development". There are two tables indicating the manner in which India and Japan have related indigenous industrial research and imported technology.

Electrochemistry Symposium/Meetings :

Rome is the venue for a Symposium on Biological Aspects of Electrochemistry organized by the International Committee on Thermodynamics and Electrochemical Kinetics of IUPAC during May - June 1971. The topics covered are : theory of biological activity and electrochemical properties, thermodynamic and electrochemical kinetics of organic redox systems of biological interest, and electrochemical membrane phenomena.

The International Committee of Thermodynamics and Electrochemical Kinetics has scheduled the 22nd Meeting on " Electrochemistry of Non-Metallic Surfaces " at Dubrovnik, Yugoslavia during September 1971, and the 23rd Meeting on " Electrochemical Engineering and Accelerated Corrosion Testing With Electrochemical Methods " at Stockholm during August—September 1962.

Electric Car :

Rapid charging stations have been installed at various points between Detroit and Chicago to enable electric passenger cars to make regular trips, and plans are under way to expand the Electric Car Expressway from New York and Massachusetts to California. This concept owes its existence to the tri—polar, lead-cobalt battery developed by Electric Fuel Propulsion Inc. in 1966. The battery has an energy - to - weight ratio more than double that of the ordinary lead-acid battery ; more important, its low internal resistance allows it to accept very large recharging currents without damage. The establishment of rapid recharging stations capitalizes on this advantage, and enables the car to multiply its range per charge several times a day - 90 to 140 miles.- Cobalt, No. 49, 1970.

Corrosion Course :

A Short Course on " Corrosion Control in Water and Waste Water Engineering " was held at Nagpur during February 1971 by the Corrosion Advisory Bureau, CSIR and the Central Public Health Engineering Research Institute.

Corrosion Conference :

An International Conference on " Corrosion Protection by Organic Coatings " is being organized, as the 61st Event of the European Federation of Corrosion, by the Hungarian Scientific Society of Mechanical Engineers and the Society of Hungarian Chemists at Budapest during May 1971.

Travemunde in Germany is the

venue for the Conference on "Corrosion and Fouling Problems on Metals in Sea Water and Brackish Waters" during March 1972, as the 60th Event of the European Federation of Corrosion.

The South African Corrosion Council will hold an International Symposium on "Progress in the Fight against Corrosion" at Durban during September 1971.

The National Bureau of Standards, Gaithersburg, Maryland, U.S.A., has announced the holding of the Third International Congress on Marine Corrosion and Fouling during October 1972.

Materials in the News

Sea water contains 35,000 ppm of dissolved solids. The volume of the ocean is 350 million cubic miles, giving a theoretical **mineral reserve** of 60 quadrillion tons. There are 57 elements, but only sodium chloride, magnesium and bromine are now being extracted in significant amounts. The major constituents are: chlorine 89.5, sodium 49.5, magnesium 6.4, sulphur 4.2, calcium 1.9, potassium 1.8. bromine 0.31 and carbon 0.13 million tons per cubic mile. Next come the following: strontium 38, boron 23, silicon 14, fluorine 6.1, argon 2.8, nitrogen 2.4, lithium 0.8, rubidium 0.57, phosphorus 0.33, iodine 0.28 and barium 0 14 thousand tons per cubic mile.—Span, Vol. 11, No. 12, 2, 1970.

A co-operative effort between the National Bureau of Standards and private industry has resulted in the production of the **highest purity aluminium** in the U.S.A., and probably the world; it has an impurity content of less than about 0.2 ppm. Being an extremely good conductor of electricity at very low temperatures, such material has a high potential for use in large cryogenic-magnet devices. The organicallyr aluminium efined by zone-refining, resulting in a material exhibiting a resistivity ratio of 45,000, as against 8,000 for the former.—Corrosion Prevention and Control, Vol. 17, No. 4, 9, 1970.

Expansion has increasingly pointed to **fluorocarbon resins** as the optimal solution to a number of major problems which plague designers of chemical plant equipment. This has been recently discussed with reference to chemical inertness, service temperatures; lined pipe, flexible nose, bellows joints, seals. gaskets, valves, filters, instruments, tank linings and electrical installations. It is concluded that fluorocarbons have much to offer the corrosion engineer, particularly where reliability and durability is required.—Corrosion Prevention and Control. Vol. 17, No. 4, 10, 1970.

Stainless Steel is now being considered as a material for coinage in several countries; France, Italy and Brazil already have these coins in circulation. The first coins were issued in 1954 in Italy. Investigations into the use of stainless steel in preference to traditional materials have shown that several types can be used for this application, among which are the straight chromium ferritic steels, Stainless Steel, No. 16, 18, 1970.

A new class of **high temperature alloys** based on chromium 20-30, aluminium 7-8, tungsten 7-8, carbon less than 0.02 percent, and balance cobalt, has been developed at the Fulmer Research Institute, England. They have good resistance to both oxidation and sulphidation corrosion. Metals and Materials, Vol. 4, No. 10. 389, 1970.

A review, with 52 references, on weldable **aluminium-zinc-magnesium** alloys covers: composition, heat-treatments and methods of use; welding; stress-corrosion, and the development of higher weld strengths. —Metallurgical Review 147, 135, 1970.

A case study has been made of the **PVC** industry in Chemical Age of India, November 1970: the industry in India, historical, manufacture, copolymerisation, processing, compounding, properties and applications, world consumption and production, and the state of the industry.

Virtually every part of a motor vehicle is dependent, often vitally so, on **tin** at some point in its manufacture or use—a minor constituent by proportion in the vast majority of its applications, but a major ingredient in terms of performance. The principal categories of use for tin are tinplate, solders, bearing alloys, bronze, chemicals, and coatings other than tinplate. The 1970 German Tin Day was held during December 1970 at Braunschweig, and nine papers on tinplate were presented. Superconductive niobium–tin alloy plays a vital part in plasma physics for controlled thermonuclear fusion studies.—Tin and Its Uses, No. 86, 3, 2, 9, 1970.

There are 2 articles under the title "Focus on **Zinc**" in the October 1970 issue of Anti-Corrosion Methods and Materials: (2) Zinc and anti-corrosion coating, (2) Metallic Zinc paints, (3) Sherardizing, (4) Hot dip galvanizing, (5) New developments in hot dip galvanizing, (6) Sheet galvanizing, (7) Treatment of effluent from hot dip galvanizing, (8) Zinc electrodeposition and (9) Depositing zinc by metal spraying.

The Fulmer Research Institute, England has developed a new class of ternary alloys of **cobalt-chromium-aluminium** of great interest in defence and civilian motor engineering: cobalt 62-74, chromium 20-30 and aluminium 6-8 per cent. They are resistent to oxidation and corrosion at high

temperatures, 800–1050°C. The alloys can be fabricated by casting or machining and even by forging, the difficult operation for all hard metals. —Physics Bulletin, Vol. 21, 466, 1970.

The International Nickel Ltd., Birmingham Research Laboratory have succeeded in developing a virtually stress-free **nickel-cobalt** electroform with twice the hardness of conventional electroformed nickel. Anticipated fields of application for dies and moulds are the production of zinc-base, and possibly glass and aluminium, die castings; and—the manufacture of electroformed press-tools. MoG supra is a new **high-chromium, high-cobalt** hot-work die **steel**, developed in Germany, with improved hot hardness and resistance to tempering and heat checking; and adequate resistance to corrosion by molten metals.—Cobalt, No. 48, 1970.

The development of hot-corrosion resistant **cobalt-base alloys** for marine applications is the topic of a detailed paper in Cobalt, September 1970 covering alloy design, procedure, results and phase stability; with 8 tables, 10 figures and 11 references.

Three 8 mm films on **Corrosion** have been notified by John Wiley & Sons, Inc., New York : (1) Filiform Corrosion: time-lapse views under a variety of conditions ; (2) Hydrogen Embrittlement: use of prestressed steel for testing inhibitors, and role of interestitial hydrogen ; (3) Aluminium: time-lapse views, with suggested mechanisms.

The development of **zinc** alloys is the title of an article in Australasian Corrosion Engineering, September 1970. It has been pointed out that there are some metals that everybody uses without knowing them, because they are components of more or less complex alloys; among them zinc is now-a-days very important. The matter is covered under: introduction, historical inquiries, prestigious alloying element, zinc alloys, electrolytic zinc, pressure die-casting, modern zinc alloys, and new alloys research.

The case for **aluminium** conductors has been discussed at length in Science Today, December 1970 with relevant statistics. It is pointed out that the use of aluminium in the electrical industry is only part of the large substitution programme, since India faces a shortage in many common non-ferrous metals.

There are 10 articles on **nickel** ores and mining in World Mining, November 1970, pages 37-68, and covering the Pacific Basin, New Caledonia, Australia, British Columbia, U.S.A. and Japan.

Copper conservation has been highlighted at the 1970 Autumn Conference of the Institute of Metals, London. Two papers presented therein have been published in Metals and Materials, November 1970 : (1) The future availability of copper supplies and (2) Primary copper : a review of methods of production and quality control.

A two-day Seminar on the "Role of **Plastics** in the National Economy" was held at Bombay during January 1971 under the auspices of the Plastics Institute, India Section and the Indian Petrochemicals Corporation Ltd. A digest covering the highlights can be found in Chemical Age of India, January 1971.

A tarnish-resistant **copper-5 tin-7 aluminium** alloy has been developed. The possible applications are in architecture and for decoration.—Tin and Its Uses, No. 85, 8, 1970.

Bronze/plastic composite bearing metals, devised to fill specific needs for bearings which would operate "dry", are now indispensable in a whole range of applications. The developments in this field have been reviewed in Tin and Its Uses, No. 85, 9, 1970.

The "Technology for Profit" Conference to be held during the Engineering '71 Exhibition at London, April 1971 consists of 6 sessions : (1) Materials for to-morrow's environment, (2) Reinforcing the future, (3) Versatility of powders, (4-5) Welding: evaluation of modern techniques, and new horizons in plant and materials, and (6) The challenge of material handling.

Pollution in the News

Marine scientists here recently warned that, in another 30 years, the oceans of the world could be dead. Instead of 140 million square miles of sea water. swarming with fish and plants, our land-masses may be surrounded by a stinking soup compounded largely of sewage, oil, chemical and industrial waste, and radioactive effluence. Modern technology has used the oceans as a dumping for everything from nerve gas to old isotopes; the surface has been smothered with oil, and the land sprayed with pesticides and insecticides. They have been plundered indiscriminately, but with increasing sophistication. There are, however, some signs that mankind is waking up to the scale and seriousness of the problem.

In Britain, a first step towards understanding the problem of pollution in coastal waters has been taken by the formation of the Natural Environment Research Council, to study the **effects of pollution on plant and animal life.** It has been pointed out that there is a film of oil covering the surface, even in open seas. Just as dangerous is the slow build-up of toxic chemicals, killing the fish or the

sea birds. Even so, man expects the sea to provide him with up to 50 per cent of his food.

International agreement and control on dumping and polluting is needed. This means treating waste before its discharge into the sea and imposing heavy fines on a tanker skippers who spill oil; then short large-scale fish farming, and turn from hunting to husbandry. An oceanologist concludes as follows: "If man realised that the danger which faces him from the dying oceans was far greater than the treat of nuclear war I am sure there would be action".— Sunday Standard, Indian Express, Bangalore Edition, Magazine Section, II, 27 December 1970.

It has been recently stressed that international cooperation in the **marine** sciences is not only desirable but essential if the nations of the world are to continue their increasing uses of the oceans in an orderly and productive manner, and preserve the quality of the marine environment. In the U. S. A. the National Council on Marine Resources and Engineering Development has been set up, and the International Decade of Ocean on Exploration offers an excellent opportunity to share in the responsibilities and results of marine exploration.— Span, Vol. 11, No. 12, 2, 1970.

Environmental Pollution in relation to the chemical industry has been discussed in the publication from England: 106th Annual Report on Alkali etc., Works, 1969; HMSO, London, 1970 (Chemistry in Britain, Vol. 6, No. 10, 411, 1970). Control of this type of pollution has been described, and it is pointed out that an environmental crisis is gradually developing everywhere, with the rapid growth of population, and the technological advancements. Construction of treatment plants for water and wastes, ventilation arrangements for effective contaminants, and other control measures are mainly engineering problems.— Bulletin, Institution of Engineers (India), Vol. 20, No. 3, 13, 1970.

The Second International **Clean Air** congress which concluded in Washington during December 1970 is one of a number of meetings leading up to the UN world Conference on the Human Environment to be held in Sweden during 1972: Fortyfive countries participated, with a contribution of 250 technical papers.

The Society of Environmental Engineers have arranged the following Conferences: (1) Noise measurement and control, Birmingham University, December 1970; (2) Dynamic testing, London, January 1971; (3) **Pollution Control**, London, March—April 1971.

Marine Pollution was the topic discussed at a World Conference organized by FAO at Rome and concluded during December 1970, after adopting a series of recommendations designed to maintain the world "in a state in which man can thrive and evolve" It was agreed that the only effective way to control pollution of the environment was to strike at the source; recycling of wastes in industry was seen as a solution in some cases.— UN Weekly Newsletter, Vol. 19, No. 1, 2, 1971.

Environment was the theme of a great number of books published in the U.S.A. in 1970, and no other subject so dominated the trade book industry as the mental and physical well-being of man in relation to his surroundings. At the American Booksellers Convention in July 1970, it became obvious that the ecological pattern would continue.— The American Reporter, Vol. 21, No. 1. 10, 1971.

The intensity of **air pollution** due to automobile exhausts in Calcutta is found to be as high as in cities like New York, Chicago and London, even though the number of vehicles is much less in the former. It is estimated that the automobiles emit into the U. S. A. air each year 350 million pounds of lead, 66 million tons of carbon monoxide and 12 million tons of hydrocarbons, causing at least half of the air pollution in that country. New standards have been established to control auto emissions in 1973 and 1975 models. A similar plan is urgently called for in India.— Indian Express, Bangalore Edition, 6, December 30, 1970.

In the Soviet Union the problem of **air pollution** has not assumed such serious proportions as in other countries – as a result of a complex of legislative, planning, design and technological measures. Soviet scientists have been able to propose the tolerances for concentrations of various forms of pollution due to industry and transport. A special Committee for Sanitary, Air Protection of the U. S. S. R. has the task of directing and coordinating such research. Some figures relating to other countries are quite alarming: (1) U. S. A.— over 200 million tons of harmful substances pour into the air every year; (2) France – in 1960, thermal electric power stations alone omitted 114,000 tons of sulphurous fumes and 82 4 million tons of soot; (3) West Germany– the factories belch forth tens of millions of tons of soot and poisonous fumes annually, and 24,000

tions of industrial waste dust falls annually on the Ruhr towns; (4) Japan – the blood of 40 out of 49 residents in the heart of Tokyo contained 2 to 7 times the normal amount of lead.— Soviet Union, No. 1 (250), 20, 1971.

From Australia it is stated that, in the **airlines** industry, the added cost of research to fight **pollution and environmental problems** will eventually be passed on to the traveller, in much the same way as the motorist would have to pay for pollution-free cars. Airport location causes difficulties. It held that "public reaction is often unjustly directed against airlines when, in fact, many existing airport environmental problems are the result of unsuitable political decisions against which the airlines have no recourse".— International Travel, No. 165, 17, November 11, 1970.

A booklet "Today—the elimination of automobile **air pollution**" by Du Pont de Nemours and Co (July 1970, 8 pages) draws attention to the technical and economic advantages of the modern internal combustion engine, and a description is given of an effective exhaust emission control system incorporating an exhaust manifold thermal reactor developed by Du Pont for use in cars operated with the existing high octane leaded fuels. Tests performed show that the system will reduce gaseous emissions to the proposed 1975 U. S. Federal Standards.

Under the auspices of the WHO, the year 1970 recorded progress on formulating a long-term programme for **environmental health**, including a world-wide system of surveillance and monitoring in collaboration with national and international bodies, determination of priorities of programmes in environmental sanitation within the Second Development Decade and the establishment of code of environmental health. This is to be presented to the World Health Assembly in 1971, and will take into account the effect of water, soil, food and air pollution, noise and other environmental health criteria and guidelines for preventive measures.

Pollution and Public Health :

Is the title of an article in Span. Vol. 12, No. 1, 1971. It is pointed out that the effects of inadequate aud unwholesome water supplies and of insanitary collection and disposal of human wastes contribute to a high incidence of disease. In addition, the problems of industrial wastes and air pollution that accompany urban growth demand solution to ensure the maximum benefits of industrialization. The current activities of the Central Public Health Engineering Research Institute, Nagpur in this field are summarized.

Catalytic combustion as a means of combating **air pollution** has been discussed in detail in a paper published in Industrial Finishing, November 1970 : principles, catalytic combustion, industrial application potential and economics.

Industrial and Domestic **Effluent Treatment** is the title of the first of articles in Chemical Age of India, January 1971.

A can reclamation centre has been opened in Pittsburgh, as part of the National Centre for Solid **Waste Disposal**, U. S. A. Empty cans thrown away are considered a serious threat to environment. It is stated that cans were reclaimed at the rate of ten million a month in the 1970 drive.— The American Reporter, Vol. 21, No. 4, 10, 1971.

There are some articles of interest in the field of **pollution** in Participant Journal, February 1971 : (1) Ecology, (2) Air pollution survey work at Nagpur and (3) Electricity-generating nuclear plants : marvellous anti-pollution machines.

Two Courses on **Air Pollution** were arranged by the University of Salford, England during January—February 1971 : (1) Measurment of Dust Concentration and Size in Ducts and Chimneys and (2) The Identification and Measurement of Gaseous Pollutants. The objective was to interest industrial, public health and local authority employees.

—T.L.R.