THE Chemical Age

VOL. LXXV | 1 SEPTEMBER 1956 | No. 1938

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Making Chemical Engineers

ANYTHING that Sir Harold Hartley says on the subject of chemical engineering must command the fullest measures of attention and respect. In *The Financial Times* of 22 August he asked whether arrangements for training chemical engineers in the UK are adequate in relation to national need. The demand for chemical engineers is rising. The output of chemical industries since 1948 has expanded at twice the rate of manufacturing output as a whole, and at present it is the chemical industries alone as a large group who are increasing their share of world trade. Here, then, in fact and prospect is the UK's most expansive opportunity. But so obviously that it seems trite to say so, the continued grasping of that opportunity depends not merely upon maintaining the existent number of chemical engineers but upon steadily increasing it.

Nor is production of chemicals and chemical products here the whole story. As Sir Harold points out, the export of processing 'know-how' can today make important contributions to our balance of trade. More and more countries whose chemical manufacturing has been meagre in the past are trying to develop their own heavy chemical industries. To assume that these new ventures can be cast in the mould of Western European practice of 50 or even 20 years ago is nonsensical—within the restrictions of materials and local labour, these chemical births of the 1950s and 1960s will require all the technological virtues of their own time. If one country cannot offer the plant and the initial 'know-how', another will. This kind of export trade follows no flag. It follows the blue prints of modern chemical engineering. To quote from Sir Harold's article, 'Britain with her long experience in the development of chemical plant can play a great part in this field, but again it depends on an ample supply of well-trained chemical engineers to design, construct and commission the new plants that are required all over the world.'

Britain's existing course for training chemical engineers—in 18 universities or technical colleges—are producing from 250 to 300 qualified men per annum. The figures are not as healthily expansive as they should be. 1953 yielded 230; 1954, 310. Since then the number qualifying annually as graduates has not risen appreciably. However, another source—through the examinations of the Institution of Chemical Engineers—is now adding from 30 to 50 per year to the number flowing from university or technical college courses. At the best estimate, therefore, we can expect from 350 to 400 new entrants to the chemical engineering profession each year.

This figure must be set against requirement which Sir Harold puts—for present needs—at 600. His method of estimation is purely tentative. In the US 2,000 new chemical engineers are produced each year; for our relative population, the comparable figure should be 600. It is open to argument whether national population figures can be relevantly compared in this matter. On a population basis many forms of British competition in world trade and influence should never

have occurred, and are unlikely to be maintained today. The plain truth is that we need to be more efficient *pro rata*, not merely similarly efficient. Our greater dependence upon export trade to finance our essential imports of basic materials enforces this. Nevertheless, any estimate of the current annual requirement for chemical engineers is academic—the supply is 350 to 400 and nothing can alter that. Assuming that the chemical industries continue expanding at their present rate, Sir Harold assesses the requirement figure of 1966 at possibly as high as between 1,200 and 1,500. We do not think his estimate is at all exaggerated. Ideals and optima are rarely achieved, but we would put the ideal figure for roughly 10 years ahead at 1,500 to 1,750.

What may be doubted, however, is whether our own chemical industries *and* our export 'know-how' and plant-construction trade will be able to continue expanding for the next 10 years at the rate of recent expansion *with the present supply of new chemical engineers*. What is now being done to stimulate qualification in this profession may well have been started too late. And it might be added that even what is being done now is still being done too slowly. Should these more pessimistic views prove only partially correct, the demand for chemical engineers each year by 1966 may be lower than any estimates above the 1,000 level simply because expansion that otherwise could have been made has been limited by 1956-60 shortages.

Against this somewhat gloomy picture, however, the technological-staffing limitations of other countries must be set. The US is worried about her chemical engineer supply, and attractive high salaries are increasingly offered by US companies to young chemical engineers here and in other European countries. It is no easy thing for a young man to have to choose between one salary in the UK and another and considerably higher salary for a job in the US. Thus our own difficulties may be aggravated.

In his review of the situation, Sir Harold did not attempt to estimate future increases in chemical engineer supply to be expected from the new expansions in training facilities, from the new chairs at universities and the new enlargements and re-buildings now in process. He felt that 'by 1958 the results . . . will be seen more clearly'. Certainly there will be greater accommodation for students—but will there be greater intake?

This question takes us back to some of the problems in chemical education that were discussed in THE CHEMICAL AGE of 25 August (page 343), and again we must strike a note of doubt. Can more chemical engineers be made at universities and colleges and technical institutes if the nation's schools are not producing more would-be chemists? The supply line starts in front of classroom blackboards and at the benches of school laboratories. If indeed we are getting more chemical engineers by 1966, it would seem that we shall at the same time be getting many less chemists. Sir Harold says that 'with the present good prospects of a career which it (chemical engineering) offers, some of the many who at present choose chemistry would be well advised to look towards chemical engineering.' We doubt whether Sir Harold's 'many' is indeed describable in terms of largeness at all, nor do we see anything being done now to encourage the teaching of chemistry in schools that can alter this comment.

Silicone Rubber Catalyst

NOW commercially available is an effective catalyst, Union Carbide X—1960 silicone rubber curing compound (Linde Air Products Co. Canada). It is in the form of a stiff white paste and contains a combination of silicone rubber gum, a filler, and 5 per cent ditertiary-butyl peroxide (DTBP). DTBP has proved to be the most useful catalyst. It is stated to give low compression set values, allow thick-section cures without tedious stepwise postcures, minimise harmful catalyst residues in the rubber and enable carbon black to be used as a reinforcing filler. Since liquid DTBP is volatile, it must be used with great care in the rubber mill to avoid the possibility of flash fires. These are greatly minimised with the development of X-1960 silicone rubber curing compound as the DTBP is so combined that evaporation does not occur if the compound is handled and stored in accordance with instructions.

NEWS BRIEFS

Symposium on Microchemistry

A symposium on Microchemistry is to be held in 1958 under the auspices of the Society for Analytical Chemistry and organised by the Midlands section and the microchemistry group. The symposium will be convened in Birmingham from 20-27 August. Further details are to be announced at a later date.

Food Research Film

A colour film of research undertaken at the laboratories of the British Food Manufacturing Industries Research Association, Leatherhead, Surrey, is being made by Pathé Pictorial. It will show the prototype of an instrument being developed for testing the spreadability of margarine, tests on the foaming of eggs, in connection with the manufacture of cake mixes, tests on the strength of jellies, and a tasting panel in session. The film will be released about the end of September. It will be shown in 800 cinemas, over nine months, to an estimated audience of 11 million.

Schoolmasters Go To Work

Up to six science masters from grammar schools in the Manchester and Liverpool districts have been invited to spend a few weeks in the Trafford Park works of Metropolitan-Vickers. Each master will select a department and section (not necessarily in his own field of science) and work as a member of a team engaged in the development of scientific instruments, radar equipment or particle accelerators, or in research in some field such as chemistry, metallurgy or semi-conductors.

Embassy Speaker

At the annual dinner of the British Manufacturers of Petroleum Equipment, to be held in London on 27 September, the principal guest and speaker will be Mr. I. P. Ganan, Commercial Minister at HM Embassy in Washington.

Fuel Saving Allowances

The Treasury Order providing for the continuation of investment allowances for fuel saving plant came into operation on Thursday of last week. This order, made under one of the provisions in the Finance Act, prescribes the fuel saving plant which will qualify for the investment allowance if installed by way of modification or replacement of plant in use in the UK. The complete list of the various types of plant concerned (together with conditions), is published in the Investment Allowances (Fuel Economy Plant) Order 1956, Statutory Instruments 1956, No. 1295.

Plastics Symposium

'Extruded Rubbers and Plastics' is the title of this year's symposium at the National College of Rubber Technology, Holloway Road, London N7, on 30 and 31 October. Organisers are *The Rubber & Plastics Age* and the registration fee is one guinea. The chairman will be Sir Miles Thomas, chairman of Monsanto Chemicals Ltd., and the symposium will present information on the different types of extruded plastics and rubbers in current use. Possible new applications in industry will also be suggested.

Oil Production in Peru

Production of crude oil in Peru in the first four months of 1956 was 5,822,877 barrels as compared with 5,707,285 barrels in the corresponding period of 1955. This increase is stated to be due to improved yields. There were, however, 3,347 oil wells in production at the beginning of 1956, an increase of 125 as compared with the beginning of 1955. The Empresa Petrolere Fiscal, the state-owned refinery, at present with one refinery at Iquitos, is to set up eight more refineries along the river Ucayli and in Iquitos.

New Coke Research Plant

A coke research plant is to be built at Wingerworth, Derbyshire, near the National Coal Board's £10 million coal carbonisation plant. The land has been leased by the Board to the Coke Research Association.

Instrumentation and Control

'Instrumentation and Control' is the theme of the London meetings of the Society of Instrument Technology for the coming session. Papers to be given are 'Accurate Calibration of Flowmeters' (25 September), 'Importance of Minimising Hysteresis in a Process Temperature Controller' (18 October), 'Control Engineering and the Automatic Process Plant' (30 October), 'Television Technique Applied to Observation and Control' (27 November), 'Phase-plane Methods in Control System Design' (12 December).

Reggio Experimental Station

PURE AND APPLIED research for the essential oil industry is being carried out by the Reggio Calabria, southern Italy, experimental station.

A series of tests for determining the technical value of some new machines for the extraction of essential oils has been made. In the field of citrus juices an American apparatus for concentration at low temperatures will be put into operation. It will be used for experimental purposes.

Tests on the distillation of spontaneous oil-producing plants are being continued in order to complete the results of an investigation carried out by the station for the Committee of Officinal Plants of the National Research Council. The characteristics and composition of the resulting products are being studied in the hope of obtaining useful data about the possible industrial exploitation of these materials.

Monsanto Results

THE DIRECTORS of Monsanto Chemicals Ltd. have announced a first interim dividend of 6 2/3 per cent (4d per 5s unit) less income tax, on the company's ordinary stock. Unaudited results for the first six months of 1956 (to 30 June) show net sales at £6,934,343 with net income before taxes of £787,722. Net income after allowing for estimated taxes is £383,522.

Sir Miles Thomas, chairman of the company, in a letter to shareholders points out that these figures relate to Monsanto Chemicals Ltd. and its UK subsidiaries and do not include earnings of the Australian subsidiary. Turnover for the first six months of 1956 is the highest recorded for any six-monthly period of a year and is equal to an increase of 6.4 per cent over the corresponding period of 1955. Export business is up by 5.5 per cent on the same basis.

Increased costs and stabilised prices have resulted in reduced profit margins, states Sir Miles, but the company is budgeting for a further increase in turnover during the first half of next year when new plants will be in operation.

DR. WALTER J. MURPHY, editor in chief of the American Chemical Society's applied journals is in this country on a brief visit. He was due to meet editors of British technical publications at the Savoy Hotel, London, on 30 August.

Chemicals against Bilharzia

TESTS are being carried out in Britain under the auspices of the Colonial Insecticide Research Committee by Dr. R. E. Galley with an underwater chemical 'mine' developed by the Bilharzia Research Laboratory, Salisbury, Rhodesia. If the tests are successful, it should be possible to eradicate the snails carrying bilharzia, and the snails' eggs, in certain lakes and waterways in the Federation of Rhodesia and Nyasaland.

The mine takes the form of a plastic brick, containing sodium pentochlorophenate, which is submerged some 18 or 24 inches below the surface—the optimum depth to deal with bilharzia. The chemical seeps through at a slow rate and spreads around the mine for some yards. One problem under investigation is control of seepage, so that the mine can be effective for months.

Industrial Injuries Acts

THE Rt. Hon. John Boyd-Carpenter, M.P., Minister of Pensions & National Insurance, has asked the Industrial Injuries Advisory Council to advise him whether, in the light of experience and current knowledge, any adjustments should be made in the terms of prescription of the diseases included in the Schedule of Prescribed Diseases for the purposes of the National Insurance (Industrial Injuries) Acts.

The necessary review is being undertaken by the Council's Industrial Diseases Sub-Committee under the chairmanship of Professor Sir Arnold Plant who is also chairman of the Advisory Council. The Sub-Committee will consider whether there should be any changes in the terms in which the diseases concerned and the occupations at risk are defined.

BA Meeting Opens

OVER 3,000 scientists are attending the British Association meeting which opened in Sheffield on Wednesday, 29 August. Earlier this week, according to a representative of THE CHEMICAL AGE, some 2,800 members had registered. Several hundred additional registrations were expected when the reception centre officially opened.

Visitors from overseas include Profesors S. N. Bose (India); E. L. Fonseka (Ceylon); L. Lemay (Canada); J. M. Luck and C. S. Smith (US); Madame S. Hebert (France); and Doctors S. Siddiqui (Pakistan) and E. W. Gorter (Netherlands).

NOTE & COMMENT

FOUR bio-chemists at the US National Cancer Institute's Laboratory of Bio-Chemistry have developed a synthetic food which provides a nourishing meal in capsule form. The food is made up of powdered amino acids (contained in protein foods such as meat, eggs and milk), organically bound phosphate, crystalline vitamins, glucose and salts. Almost 40 ingredients go into the final product, a white soluble powder. The food is given in liquid form. Essential fats and fat-soluble vitamins are supplied as a separate liquid. The food has been tested on rats, which are reported to have thrived on the diet. Male rats proved as fertile as normally fed rats and female rats bore and suckled their young. As a full-grown rat took only about one ounce at each meal (and half of this was water) small amounts of the food are sufficient to satisfy appetite and provide necessary sustenances. The diet was developed as an emergency measure for feeding premature infants and persons allergic to certain proteins.

Chronic Arsenic Poisoning

IN AN ANNOTATION on arsenic poisoning in the *British Medical Journal* of 11 August it is stated that industrial processes result in relatively few cases of chronic arsenical poisoning, eight cases being reported during the years 1950-1954. Cancer of the skin from arsenical industrial processes appears to be rare but has been reported in sheep-dip workers. However, a relative excess of cancer of the skin and respiratory track has been found in a group of workers exposed to inorganic arsenical dust. Dusts may lead to exzemas and pigmentation of head and neck, but more common and characteristic is the painless perforation of the nasal septum. Other industrial hazards arise from arsenuretted hydrogen, which acts as a haemolytic agent, and from organic arsenic compounds, which have vesicant as well as systemic effects.

Arsenic, in small quantities, is detected by the Gutzeit method or spectrographic analysis. Today, however, analysis by radioactivation can be practised by virtue of the advent of modern nuclear reactors. Specimens are placed in a nuclear reactor, the induced radioactivity is measured by Geiger counter and provides an indication of the amount of the target element present in the original samples. Meinke (1), claims, provided a source of sufficiently high neutron flux is available, a much higher sensitivity for this method than for chemical methods. (1) Meinke, W. W., *Science*, 1955, **121**, 177.

Polymers & Springs

PLASTICS may soon invade yet another metallurgical field, and one of wide application—springs. Plastics have so far offered a small threat to steel or copper in this field because methods of making plastics springs have proved difficult to devise; also, it seems doubtful whether many plastics materials would possess sufficient mechanical strength allied with elasticity. However, the National Bureau of Standards, US, has developed production methods for springs made from glass-fibre reinforced resin plastics. Even the moulding process is plastics-based, vinyl copolymer tubing being used. Epoxides and polyesters are said to have been the most suitable resins, but there are wide-ranged opportunities for varying the mechanical and thermal properties of these springs by selecting suitable amounts of glass-fibre and selecting different resin polymers. The Bureau of Standards process is described (in *Canadian Chemical Processing*, 1956, 40, 7, 52) as being adaptable for mass production.

Whether in normal uses of springs, these 'synthetic' products would compete for cost or efficiency with the already established metal articles, remains to be discovered. Such competition might be stimulated only during some emergency period of metal scarcity. But there are various circumstances in which springs are used where plastics-made springs

might be preferable. They offer such unique properties as low conductivity to both heat and electricity, high chemical corrosion resistance, and they are non-magnetic. Their possible usefulness in chemical plants is obvious. From an engineering angle, it may also be said that plastics springs can be moulded in any shape or size without creating internal stress forces.

Commonwealth Aluminium ?

IT WOULD be difficult to find a better example of natural resources development than the Volta River project. Hydro-electric power production and very large bauxite deposits can be brought together. Probably the Gold Coast could produce 200,000 tons of aluminium per annum. This would relieve the country's heavy dependence upon the cocoa crop and at the same time the new source of aluminium within the sterling area would save about $100 million a year. Ten years ago this extra amount of aluminium production would have been nearly equivalent to a third of total world production —today, however, it would amount only to about one-twelfth or one-eleventh. This enhances the economic desirability of the project. An excessively large slice of world output in any material is more vulnerable to trade or technical changes than a moderately sized slice. However, we have discussed the merits of the Volta River scheme before (see THE CHEMICAL AGE, 1952, **67**, 753)—when the 1952 White Paper was issued.

The weighty and tri-voluminous *Report of the Preparatory Commission* published recently has not cast any doubts upon the scheme. Its only note of discouragement is the much higher capital cost that has been estimated. In 1952 a figure of £144 million was suggested. Based on prices ruling in later 1955, the Commission has estimated the full capital cost at £230 million. The enlargement of this figure is partly due to an extension of the original dam project that can provide an extra 10 per cent of power, partly to increases in costs since 1952, and partly to the naturally more thorough costing examination made by the Preparatory Commission.

Can the scheme now be financed and started ? It would, years ago, have been an obvious project for British finance, private or public. Now it is passed—and fairly hopefully—to the International Bank for Reconstruction and Development. Even so, political considerations may intervene. The Gold Coast Government has already stated that the final agreements—presumably involving them, the UK Government, and aluminium companies—should be signed by a Gold Coast Government representing a sovereign, independent nation.

Applications of Furfural in Italy

THE INCREASING applications of furfural, as solvent and for the preparation of artificial plactics, has induced some scientists to determine the raw materials which offer the largest yields. An investigation of this subject was carried out by Dr. Ciusa and Dr. Di Taranto of Bari University.

Some industries in southern Italy employ exhausted olive cakes as a primary material for the production of furfural. Since there are several other raw materials whose cost seems of the same order as that of the exhausted olive cakes, the two scientists decided to establish how much furfural could be extracted from these materials.

The selection was limited to primary materials of very low cost. The determination of furfural was made by the classical method. The furfural content determined be this method does not correspond to the industrial yield: the data obtained therefore have only an indicative value.

The data obtained show that many materials give better yields than olive cake. Particularly high yields were obtained from almond shells, apricot stones, peach stones and cherry stones. However, it is essential that the primary materials should be concentrated in given localities since heavy assemblage and transport costs would otherwise have to be taken into account.

PEOPLE in the NEWS

● MR. J. R. WINGFIELD has been appointed a director of Huntington, Haberlein & Co. Ltd. (subsidiary of Simon-Carves Ltd.) He will be retaining his position as company secretary.

● MR. J. T. MORGAN has been appointed plant and services manager at the Wearside glassworks of James A. Jobling & Co. of Sunderland.

● MR. W. L. KLEIBER has been named manager of the Rochester, New York, US, plant of the industrial chemicals division of Olin Mathieson Chemical Corporation. Mr. Kleiber joined the former Genesee Research Corporation in 1947 as a plant engineer and became plant superintendent in 1952. Genesee and its parent company, Puritan Corporation, joined Olin Mathieson in 1954. A chemical engineering graduate of Case Institute of Technology, Mr. Kleiber is a member of the American Chemical Society and American Institute of Chemical Engineers.

● DR. H. W. MELVILLE, F.R.S., took up his appointment as secretary of the Department of Scientific and Industrial Research on 27 August 1956.

● DR. G. B. B. M. SUTHERLAND, F.R.S., will take up his appointment as director of the National Physical Laboratory on 14 September 1956.

● MR. C. C. TULLEY, a research assistant in the furnace department of the British Coal Utilisation Research Association, has been awarded a special prize from the James Clayton Trust Fund of the Institution of Mechanical Engineers, for his outstanding performance in the recent Higher National Certificate Examination.

● MR. KENNETH PRIDDY has been appointed exhibition manager of Beck & Pollitzer (Overseas) Ltd. He has been with the company for 16 years and he will attend most foreign exhibitions. His services are at the disposal of intending overseas exhibitors.

● The following appointments applying to the industrial chemicals division Baltimore, of the Olin Mathieson Chemical Corporation, US, have been announced. MR. JAMES G. CHALFANT has been named market development manager. He was formerly in charge of market development in the company's general research organisation in New Haven, Conn. MR. BERNARD N. SCHRAUF, also formerly at New Haven with responsibility for market research on new products, has been appointed market research manager. MR. NORMAN C. SCHULTZE, who has been supervisor of organic sales services in Baltimore, is named technical service manager. All three men will be located in the division's headquarter offices in Baltimore, US.

● DR. LADISLAUS L. MARTON of the National Bureau of Standards has been elected to the Royal Academy of Belgium in recognition of his contributions to science. Dr. Marton will fill the vacancy left by the Dutch physicist, J. VERSCHAFFELT, who died last year.

● DR. J. PEARSON, Ph.D., M.Sc., F.R.I.C., assistant director of the British Iron and Steel Research Association, will take over charge (from to-day, Saturday) of the Sheffield laboratories and will have his office at Hoyle Street, Sheffield 3. He will remain head of the steelmaking division but will relinquish control of the chemistry department for which MR. E. W. VOICE, head of the ironmaking division, will become responsible. Dr. Pearson has also been designated for the post of consultant to the File Research Council. MR. R. H. HANCOCK will continue as senior investigator.

● MR. S. L. MAGUIRE, LL.B., formerly managing director of Evans Medical Supplies (India) Private, Ltd., has been appointed general manager of Evans Medical Supplies (Northern) Ltd. as from 1 September.

● The wedding took place on 23 August at St. Stephen's Church, West Bowling, Bradford, of MR. ARTHUR D. CRAVEN and MISS CHRISTINA WATKIN. The bridegroom is on the staff of the Fibres Division of Imperial Chemical Industries at Harrogate.

● The Upjohn Co.'s International Division states that MR. R. M. BOUDEMAN has been appointed assistant general manager. He will supervise all functions of the pharmaceutical company's international operations not directly associated with selling.

Beilby Memorial Awards

APPLICATIONS for awards under the Sir George Beilby Memorial Fund should be made to the Convenor of the Administrators, Sir George Beilby Memorial Fund, The Royal Institute of Chemistry, 30 Russell Square London WC1, not later than 31 December 1956.

The application should be accompanied by nine copies of a statement of the candidate's career, together with a list of papers or other works published. Candidates are advised to forward one reprint of each published paper if possible.

Awards are made from this fund to British investigators as an appreciation of distinguished work, particularly in the fields of fuel economy, chemical engineering and metallurgy.

Sales of LP-Gases in US

SALES of liquefied petroleum gases in the US increased by 17 per cent during 1955, compared with a minor gain in 1954, according to a survey made by the Bureau of Mines, United States Department of the Interior. Outstanding increases for several of the principal uses were indicated—30 per cent for chemical plant raw material, 32 per cent for synthetic rubber components, and 40 per cent for industrial uses. The large gain in the amount of LP-gases used at chemical plants can be partly attributed, the Bureau records, to some raw materials used but not covered prior to the 1955 survey. These additional gases were reported as 2,468,000 gallons of isobutane, 419,534,000 gallons of ethane, and 62,703,000 gallons of methane-ethane mixtures.

Chemical Industry Possible

CONSTRUCTION of an $11 million oil shale burning electric generation plant is proposed for Hillsboro, New Brunswick, Canada. It is believed that if the scheme is undertaken, establishment of a chemical industry in Hillsboro will follow.

Valuable products such as potash, alumina and magnesium can be extracted from the residue after the oil shale has been burned. Other chemicals can be extracted from the gases generated in the burning process.

Under the current proposal the power plant will be financed and built by the Nashwaak Corp. of Canada.

Honouring Perkin

FURTHER honours will be paid to Sir William Perkin, discoverer of mauveine. A plaque for which Wembley History Society opened a public appeal for funds, is the town's way of marking the centenary. The plaque, a bronze one with an inscription in white, will stand on a brick plinth on the grass area in the forecourt of Sudbury Methodist Church, where Sir William founded the original place of worship.

The unveiling and dedication ceremony will take place on 8 September. Dr. E. D. Hughes, Professor of Chemistry at London University, will perform the unveiling. He will represent the Chemical Society. Other visitors will be Sir John Simonsen, representing the Royal Society, Dr. E. Lester Smith, on behalf of the Royal Institute of Chemistry, and Mr. R. S. Haskew, representing the ABCM. Members of the Perkin family will also be present.

Titanium Fire at Sheffield

IT IS understood that a quantity of titanium was damaged by fire at the process plant of William Jessop, Sheffield, on 24 August. The metal is said to have been in a container and Sheffield fire brigade units used sand to control the blaze. Cause of the incident is not known. On 18 April, a minor explosion occurred in the titanium plant of ICI Ltd. at Witton, Birmingham. Safety standards for titanium were discussed in THE CHEMICAL AGE of 16 June.

Nickel Information

TO BE ISSUED periodically to all interested in nickel and its by-products is *The Mond Magazine*. It includes illustrated articles and notes on many subjects. In future issues there are to be articles on uses of nickel, copper, cobalt, gold, silver, the platinum metals, selenium, tellurium, sulphur and iron ore. Copies are obtainable free of charge from The Mond Nickel Co. Ltd., Publicity Department, Thames House, Millbank, London SW1.

US Chemical Injuries Drop

According to a compilation prepared by the US National Safety Council, the frequency rate of injuries in US chemical industry dropped 22 per cent in 1955 compared with 1954. The severity rate fell by 9 per cent as compared with 1954.

Chilean Nitrate Production

NITRATE PRODUCTION in Chile in June was 96,000 tons, a fall of nearly 25 per cent from the level reached in the corresponding month of 1955; July production figures are expected to be even lower because of the strike at the Anglo-Lautaro Nitrate Corporation plants.

Nitrate shipments in the 12 months ended 30 June amounted to 1,344,000 tons, compared with 1,487,000 tons in the previous 12 months. To offset the industry's difficulties in disposing of the proceeds of some of its sales to trade agreement countries, the Chilean authorities permitted banks to grant credit to the industry outside the banks normal expansion margins.

Under consideration is another scheme to assist the industry, whereby the Banco de Estado would purchase 100,000 tons of nitrate from the Corporación de Ventas de Salitre y Yodo de Chile (Covensa) and resell it to farmers on favourable credit terms. One advantage of this scheme would be that wider use of nitrate in the country's agriculture would be encouraged. At present only some 65,000 tons a year are used in this way.

Leipzig Fair

INTENDED sales and purchases to be made by the East German Republic at the Leipzig Autumn Fair have been announced.

Goods which will be exhibited at the fair will include the following materials:—

Chemico-technical products, pharmaceuticals, insecticides, inorganic dyes and pigments, organic basic chemicals, p.v.c.-Schkopau, solvents softeners, black/white and colour films, mineral oils and tar products, cresol, rubber products of all kinds excepting tyres, photochemicals, inorganic basic chemicals, potash, nitrogenous fertilisers etc.

Goods which will not be exhibited but for which contracts can be concluded will include mining products such as sand, fluorite, chalk and potash fertilisers, as well as chemical plant.

The East German Republic hopes to purchase a variety of chemical products, including:—

Phosphate fertilisers, dyes and pigments, acetyl cellulose, photo-gelatine, pharmaceuticals, ether, oils, laboratory and analytical chemicals, caoutchouc, various rubber articles, borax, artificial resins, fatty acids, vegetable tanning materials, linseed oils etc.

Further Education

INFORMATION on the facilities available for study in Yorkshire is given in *A Guide to Courses in Chemistry and Allied Subjects* published by the Yorkshire Council for Further Education.

Details are given on full-time and part-time courses leading to National Certificates and to Qualifications of the various professional bodies, such as Royal Institute of Chemistry, the Institution of Chemical Engineers and the Plastics Institute. Courses are also available for the University of London External Degrees, City and Guilds of London Institute Certificates, and for Medical Laboratory Technicians.

Copies of the pamphlet (No. 55) may be obtained (price 1s) from: The Secretary, YCFE, Basinghall Buildings, Basinghall Street, Leeds 1.

Textile Conference

PAPERS on 'Static Electricity in Textiles' will be presented at the second of the present series of overseas conferences to be held by the Textile Institute. It is anticipated that more than a hundred textile experts and scientists from Britain will gather in Zurich from 13 to 17 September.

The total attendance is expected to exceed 200, and will include visitors from Canada and the US.

In 1916 the Textile Institute raised a fund to undertake research on the electrification of fibres and in 1917 an agreement was entered into with Leeds University to pursue the matter. Responsibility for the work was eventually passed, with the balance of the Institute's fund, to a 'West Riding Research Committee' formed by Yorkshire manufacturers. It was from this committee that the Wool Industries Research Association grew.

A paper dealing with work done by the Wool Industries Research Association in the same field is among those to be discussed at Zurich.

Borax Raises Prices

Because of recent rises in ocean freight costs, Borax Consolidated Ltd. will increase the price of its chemical products by £1 per ton as from 1 October. The company announced last week that unless exceptional circumstances arise, it intends stabilising these new prices until at least 31 March 1957.

From all Quarters

Timor Oil Deposits

Oil samples, believed to be of commercial nature, have been obtained from Portuguese Timor by an Australian syndicate granted oil rights there. During World War II, the Japanese occupation forces made practical use of the oil to drive their vehicles, after devising crude processing methods. The Timor natives also refine the oil for use in vehicles and for crude lighting. Oil exploration will be undertaken to determine the possibilities of production drilling.

US $1.6m. Order for Saint-Gobain

The Saint-Gobain Company of France has obtained a $1.6 million (£570,000) order to supply equipment for a sulphuric acid and fertilisers plant in the Philippines from the Atlas Consolidated Mining and Development Corporation. The plant will be built in the neighbourhood of the Atlas Corporation's copper mine at Toledo, Province of Cebu, and will process the pyrites produced. Production is expected to begin at the end of 1957 and total some 127,000 tons of fertilisers.

Oil Search In France

An exclusive oil exploration permit has been granted to the Societe Anonyme Francaise de Research et d'Exploitation de Petrole, following a decree published in the Journal Officiel last week. The permit covers 203,000 hectares in the Aube and Yonne Departments, Central France, and will be valid for four years. The company has been ordered by the Ministry for Industry and Commerce to increase its capital to a minimum of Frs.100 million.

Ceylon State Industries

The Minister of Industries in Ceylon is reported to have decided not to sell shares in State industrial corporations to the public. He intends to control the corporations, but to leave the everyday management to Boards to which private businessmen will be eligible for appointment. Industrial concerns now controlled by corporations include factories engaged in the following fields: Leather, caustic soda, cement, vegetable oil, papermaking and ceramics.

Swiss To Buy US Uranium

The United States is to sell 500 kilogrammes (nearly half a ton) of uranium-235 to Switzerland it was announced last week. The sale is part of the recent agreement between the two countries for development of peaceful uses of atomic energy. The US will also supply atomic equipment which is understood to be normally subject to classification. Under the agreement American experts are entitled to exercise a certain supervision of the uses to which the uranium and equipment are being put. Switzerland has agreed to grant the US specified rights over discoveries in her country.

Syrian Oil Refinery

A Syrian Ministry of Works source in Damascus stated recently that the technical committee considering tenders for the construction of a Syrian Government oil refinery was expected to decide the successful tender very shortly. The Czechoslovakian Techno-Export Organisation had offered to have the refinery in production in one year, costing 20 per cent less than the British tender submitted by Procon (Great Britain), which was the next best and stated to amount to 55 million Syrian pounds (£5.5 million).

Canada's First Hydrofluoric Acid Plant

Nichols Chemical Co. Ltd. plans to build Canada's first liquid hydrofluoric acid plant at its Valleyfield, Quebec Works. Both aqueous and high purity anhydrous products will be produced. Construction is scheduled to start immediately on a large capacity unit which is intended to supply tonnages required by the metal, glass, petroleum, atomic energy and other industries, as well as by Nichols for its own requirements. At present, all hydrofluoric acid sold in Canada is imported from the US and Europe.

Hercules Reduces Prices

Hercules Powder Co. Ltd. announces an overall reduction in the prices of its synthetic resins, effective immediately. Hercules synthetic resins are of primary interest to manufacturers of paints and varnishes, printing inks, floor coverings, adhesives and lacquers.

US Chemical Meeting

To be Held in Pittsburgh

THE 1956 national meeting of the American Institute of Chemical Engineers will be held in Pittsburgh, Pennsylvania, US, from 9 to 12 September. A series of special symposia will be held, together with committee meetings, plant visits and social events.

A condensed programme of the meeting is as follows:—

Sunday 9 September 1956

2.30 p.m.—Panel discussion — 'Industry-university relations in the procurement of technical personnel', Urban Room.

8.00 p.m.—Get acquainted party, Ballroom.

Monday 10 September 1956

9.30 a.m.—Technical session No. 1—Symposium on scientific aids to management-chemical engineering operations research, Urban Room.

9.30 a.m.—Technical session No. 2—Symposium on unit operations in nuclear engineering, Ballroom.

12.15 p.m.—Luncheon—Welcome to Pittsburgh, Pittsburgh Room.

2.00 p.m.—Technical session No. 3—Symposium on scientific aids to management-chemical engineering operations research, Urban Room.

2.00 p.m.—Technical session No. 4—General papers, Ballroom.

Tuesday 11 September 1956

9.00 a.m.—Technical session No. 5—Symposium on unit operations in nuclear engineering, Ballroom.

9.00 a.m.—Technical session No. 6—Symposium on explosions in chemical engineering, Urban Room.

12.15 p.m.—Benjamin Franklin commemorative luncheon, Pittsburgh Room.

2.00 p.m.—Technical session No. 7—General papers, Ballroom.

7.00 p.m.—Banquet, Ballroom.

Wednesday 12 September 1956

9.00 a.m.—Technical session No. 8—Symposium on distillation computation methods, Urban Room.

9.00 a.m.—Technical session No. 9—Symposium on mixing, Ballroom.

2.00 p.m.—Technical session No. 10—Symposium on mixing, Ballroom.

Headquarters of the Institute during the meeting will be: Penn-Sheraton Hotel, Pittsburgh, Pennsylvania. Permanent address of the Institute is: 25 West 45th Street, New York 36, NY.

Liquid Sampling Device

A PATENTED device for sampling liquids contained in big vessels such as tanks for gasoline, naphtha, oil, molasses etc. was recently tested in Italy.

Particularly suitable for viscous liquids which may form into layers, the apparatus consists essentially of a cylindrical tube with an air-tight piston. The liquid to be sampled is drawn into the cylinder through a hole at the bottom. The movement of the apparatus in the tank is coupled to the movement of the piston in the cylinder. For example, if the depth of liquid to be sampled is 10 metres the piston will move 20 cm. in the cylinder. The connection between the movements of the piston and cylinder is obtained by a chain and gearing drive specially calculated for obtaining the desired movement ratio.

As the cylinder moves down through the liquid it sucks in a representative sample. When the cylinder reaches the bottom of the tank it can be extracted without reversing the piston travel. The sample is retained by means of a valve.

Ortalion Produced

The Bemberg-owned factory in Gozzano, Italy, is now producing Ortalion yarns. Ortalion is a polyamide fibre belonging to the nylon 6 group of fibres. Uses of Ortalion include the manufacture of stockings, fine fabrics and fabrics for industrial and military use.

Bauxite Plant Planned

Plans to build a £10 million plant in Jamaica have been made by the Kaiser Bauxite Co., an American firm. The company is awaiting the Government's permission to improve harbour facilities and to erect a pier at Discovery Bay.

Blending & Mixing of Liquids

Simple Computor Overcomes Difficulties

In many oil refinery and petrochemical plants, accurate blending or mixing of a number of liquids must be maintained in a pre-set ratio. This can be simply achieved by setting the desired values of the controllers on each flow line to the required ratio with respect to master flow. If, however, the flow deviates from desired value for a short time, the ratio will not be maintained. Furthermore, if the desired value of the master flow controller has to be adjusted to meet a change in plant conditions all the sub-master controllers must be at once adjusted manually if the product is to remain a constant blend. A solution to this problem is suggested in an article by G. L. Law of Evershed and Vignoles instrumentation and controls division, which appeared in the July issue of 'Evershed News.'

THE use of the Evershed simple computor, says the article, has enabled these operating difficulties to be overcome and the ratios maintained accurately and automatically regardless of changes in the main flow. Even when the master flow desired value is changed, the ratios will still remain constant. A typical installation has recently been supplied to a refinery in Canada to control the blending of basic petroleum spirit. The equipment comprises one master flow and four sub-master flows to be maintained in a strict ratio. Furthermore, the ratio of each sub-master flow to master flow must be capable of adjustment within the limits specified by the plant engineers.

A flow transmitter is required on each of the five flow lines. The differential pressures required to operate the transmitters are derived from orifice plates fitted in each pipeline. In this particular installation, the Barton gauge was used with an electronic repeater transmitter attachment fitted as an integral unit (described in Evershed's publication PL59/M). An output of 0-30 milliamperes DC directly proportional to instantaneous flow is obtained from each transmitter. The connection diagram shows the layout of the scheme.

The measured value current 0-30 milliamperes DC from the master flow transmitter is fed to an Evershed three-term process controller. The controller output 0-15 milliamperes DC is fed to an Evershed valve positioner which converts the signal to a proportional air pressure 3-15 p.s.i. applied to the head of an air operated diaphragm type control valve. The master flow is therefore controlled at desired value by the three-term controller. The measured value loop is also connected to one pot coil winding of four simple computors in series. These computors automatically give the desired value DC milliamperes output to each of the sub-master flow controllers.

The computors consist of two coils working in pot magnets fitted at each end of a balanced beam pivoted at the centre. The measured value current fed to the one pot coil is balanced by the current in the second pot coil on the other side of the beam. A moving contact is fitted to this end of the beam working between a pair of fixed contacts to bias a valve and alter the current through the pot coil to rebalance the beam. This is the normal electronic repeater force balance system operating in conjunction with a power unit as described in Evershed's publication EN 266.

All four sets of computor windings are of substantially the same resistance, but the current through the coil on the measured value side of the beam is shunted in each computor by a fixed and variable resistor to produce the flow ratio required on each sub-master flow. The maximum ratio setting required is first decided and the fixed resistor value calculated assuming the terminal resistance of the computor windings is the same, $R_3 = R_6$. The ratio limit required is obtained by taking the maximum and minimum sub-master flows.[1]

[1] $\text{Ratio} = \dfrac{\text{Sub Master Flow (Max.)}}{\text{Master Flow (Max.)}} : 1 : \dfrac{\text{Sub Master Flow (Min.)}}{\text{Master Flow (Min.)}}$

A formula to evaluate R_1 for any ratio can then be derived. Taking ratio K as greater than 1,[2]

[2] $R = -(1-K)(R_2 + R_3) \pm \sqrt{[(1-K)R_2 + R_3)]^2 - 4(1-K)(R_2+R_3)2(1-K)}$

with Automatic Control

The maximum ratio can if necessary be altered at a later date by substituting resistors R_1 and R_4 in each computor. The variable resistors R_2 and R_5 comprise two linear wound potentiometers ganged so that when the ratio is greater than one and at the maximum limit, R_2 is at a maximum while R_5 is at zero. The wire size and resistance value of the variable potentiometers are chosen to give a sufficiently open scale on the ratio dial calibration so that accurate ratio settings can be made, bearing in mind the permissible ratio range which can be obtained by shunting the pot coil of the computor.

Ratio with Simple Computor

A ratio of up to at least 8:1 is possible with a simple computor having pot coils and magnets disposed on each side of the balanced beam. The double wound pot coil computor (having a single pot coil with two separate windings) can be used up to a ratio of at least 4:1. A skirted knob is fitted to each ganged potentiometer, with a dial plate on the panel calibrated in terms of ratio. The output from each computor is fed into the desired value circuit of each sub-master flow controller.

Flow Line

On each sub-master flow line, an orifice plate is fitted with an associated Barton gauge and an electronic repeater transmitting attachment as for the master flow line. The Evershed three-term flameproof controller positions a valve as before. The desired value setting of these controllers is normally at zero and the signal is derived from the computor output. If the desired value is set at a finite value, this will introduce a constant into the ratio setting between the master flow and that particular sub-master flow.

Any change in measured value of the master flow transmitter will immediately affect not only the master flow controller output to the valve positioner but also the balance of all the computor beams. The

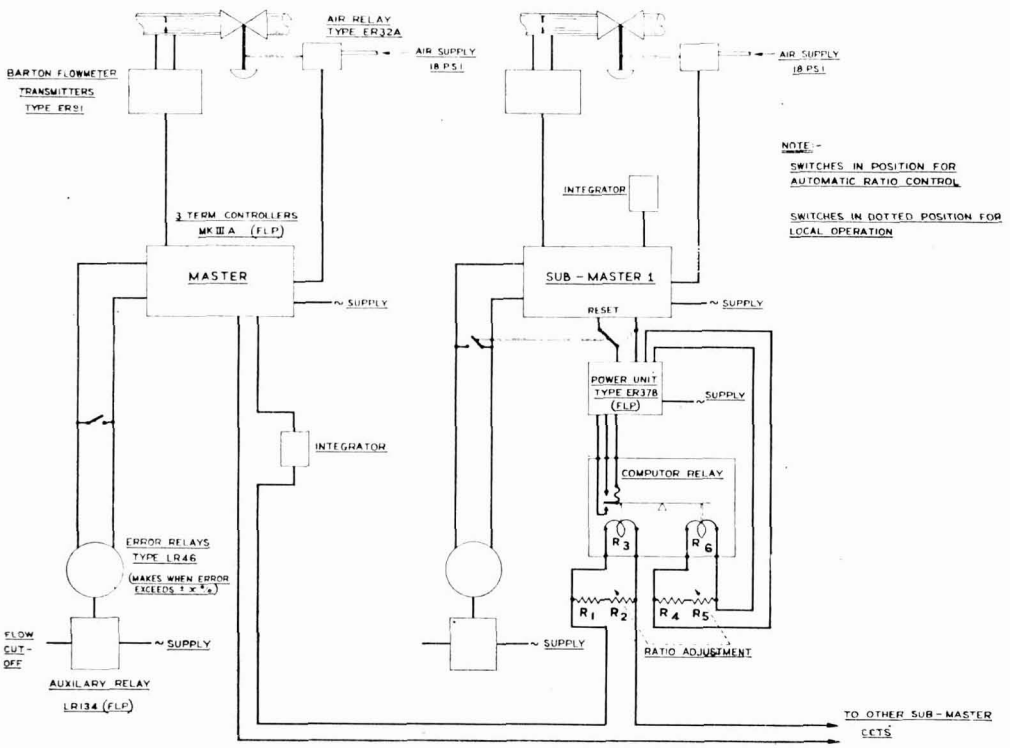


Diagram of the flow ratio control scheme

Automatic Control

beam contact arrangement will act through the electronic repeater force balance system to restore the balance, and this will result in a change in the computor output and therefore an alteration to the desired value of each sub-master controller. The flow ratios will therefore be maintained regardless of changes in master flow.

An alarm system is included to operate immediately the difference between measured and desired value on any of the controllers exceeds a pre-set figure. The system comprises a centre zero moving coil milliammeter movement having a moving contact arm which closes the relay circuit of a separate flameproof auxiliary relay through high and low level adjustable contacts. It is, however, possible to depart considerably from desired value when the controllers are on hand control. To avoid operation of the alarm system under these conditions, a switch is inserted in the error circuit of each controller so that the alarm can be made inoperative on hand control.

Six digit milliampere hour integrators are included in the measured value loops of all controllers. These integrators have automatic temperature compensation fitted internally. The electronic repeater force balance system is certified intrinsically safe for Group II gases and therefore no flameproof housings are required for the Barton transmitter ER91, valve positioner ER32A, simple computor ER92 and the integrator. Where mains supplies are fed into the units, that component is housed in a certified flameproof case. The controllers, power units and auxiliary alarm relays are therefore housed in flameproof cases.

Higher Technological Courses

Details of special courses for 1956-1957 are announced by Acton Technical College, High Street, Acton, London W3. These include a series of 12 lectures on 'Recent Advances in the Chemistry of Oils, Fats and Waxes' (fee for complete course, £1), 12 postgraduate lectures on 'Radiochemistry' (fee for the course, £1) and courses on plastics technology, high polymer chemistry, chemistry and technology of cosmetics. Beginning in the Autumn term is a full-time special laboratory course on paper chromatography and ion-exchange, the fee for which is £2 10s.

New Canadian Plants

CANADIAN INDUSTRIES LTD. have now placed a contract for a new hydrogen peroxide plant to be built at Hamilton, Ontario. Orders have also been placed for major equipment. The ammonia plant under construction by this company at Millhaven, Ontario, will be in operation before the end of this year. At Cornwall, the additional chlorine and caustic soda plants are in full production.

With the co-operation of the Quebec Government, Canadian Industries Ltd. have purchased 3,400 acres of Crown land between the town of Seven Islands and the Moisie River, on which a plant for the manufacture of blasting agents will be erected. The plant will supply consumers in the Quebec-Labrador area. Tenders for the construction of the plant are being issued. Canadian Industries Ltd. plan to have the first unit in production early in 1957.

Welding Tuition Charges Increased

British Oxygen Gases Ltd. announce that the cost of tuition for all their oxy-acetylene welding courses is being increased. The courses, which last for two weeks, will cost £10 instead of £7, starting from 1 September. Nearly 1,500 students attend annually at the various Brtish Oxygen welding schools, which are situated at Cricklewood, Glasgow, Chester-le-Street, Manchester, Leeds, Birmingham, Cardiff and Bristol.

Price of the oxy-acetylene cutting course remains unchanged at 15s per day, and the cost of the Argonarc welding course also remains at £11 5s.

Rare Earth Oxides

Availability of a complete range of the rare earth oxides and salts of lanthenum to lutecium (atomic numbers from 57 to 71) are now available from Research Chemicals Inc., US, a subsidiary of the Nuclear Corp., US. Other high purity compounds available are salts of hanfium, tantalum, columbium, rubidium and cesium. Compounds may be ordered as oxides, acetates, chlorides, nitrates and sulphates and from 98 to 99.9 per cent purity.

Colombian Oil Production

Oil production in Colombia for May was 121,051 barrels a day. This was slightly lower than the output in April, but was still higher than any previous month.

Indian Newsletter

Our Own Correspondent Reports

INDIA's first atomic reactor went into operation on 4 August 1956. The chairman of the Atomic Energy Commission said that this was the first atomic reactor to be constructed in Asia and among the first six in the world. India's aim was to make her atomic energy production programme independent. Hence, India intended to produce her own heavy water, graphite and uranium. Following this reactor which will be used only for experimental purposes, a second and third reactor would be constructed in the country.

The reactor, which is housed in a hall, 100 ft. long, 50 ft. wide and 70 ft. high, consists of a rectangular tank with massive concrete walls eight and a half feet thick, and is immersed in a pool of water. The concrete shield is pierced by a number of holes, known as experimental channels, which extend towards the core of the reactor. Neutrons flow down these channels and are used for experiments. Further, in these experimental channels materials can be placed for irradiation and later studied for the effect of radiation.

It is now learnt that a detailed plan of the first open cut of the mine to be excavated for the Neiveli lignite project is expected to be submitted by the consulting engineers, Powell Duffryn Technical Services Ltd., London. The standing committee of technical experts for the Neiveli lignite project, which has reviewed the results of pumping tests, is of the definite opinion that the tests have proved beyond doubt that the pressure surface of the artesian aquifers can be controlled to facilitate the mining of lignite.

British Enterprise

A new factory, a British enterprise, to produce superphosphate, at Avadi, near Madras, will be established within the next few months. It is expected to go into production early next year and its product capacity will be 33,000 tons per year. It is stated that the establishment of the factory will go a long way towards meeting the demand in South India for fertilisers for improving agricultural production.

The Andhra Government is concerting measures to increase the production-potential of the State-owned ceramic factory at Gudur. It will soon be securing the services of an expert from the United Kingdom to install the large-sized kiln costing nearly Rs. two lakhs (£15,000) for the manufacture of electric insulators in the Gudur ceramic factory. In addition to this new manufacturing line, the existing facilities for producing sanitary ware will be expanded to increase the annual production from two lakhs lb., as at present, to six lakhs lb. The sanitary ware produced in that factory finds a ready market as it costs only about half the price of foreign goods.

Use of Plastic Pipes

The possibility of utilising plastic pipes instead of steel pipes for water supply and sewerage should be explored in India, according to the Health Minister of the Government of India. The matter has already been taken up with the Minister for Commerce and Industry and it is likely that a pilot project for experimenting with plastic pipes will be launched shortly. Plastic pipes are cheaper and as durable if not more so than steel pipes. It would be more profitable if they were manufactured in the country. Firms in the United States might be interested in setting up a factory in India for the manufacture of such pipes.

The Industrial Chemists Laboratory at Baroda is to be expanded to cater for the needs of cottage and small-scale industries. A similar laboratory is also planned at Poona. This was revealed by the Minister for Finance and Industries of the Government of Bombay while inaugurating the 20th annual general meeting of the Association of Indian Industries recently. The Government will establish a test house in Bombay to assist small and medium sized industries in testing their raw materials and finished products and to solve the technical difficulties in the manufacturing process.

A new plant of National Peroxide Ltd., to manufacture hydrogen peroxide was opened recently in Bombay. Laporte Chemicals Ltd., of Luton, England, the main suppliers of hydrogen peroxide to India, planned manufacture of the chemical in this country in association with Indian indus-

Record Rutile Output

ACCORDING to Australian mining experts, beach sands in northern Queensland are expected to produce a record output of rutile, valued at more than £A3 million. This will be double last year's output. Titanium and Zirconium Industries Ltd. have nearly completed a £A500,000 expansion programme at Stradbroke Island, off Queensland's eastern coast. The company are aiming to double their 12,000 tons annual output. By means of a seven-mile ropeway it is possible for 30 tons of concentrates an hour to be transported from the sand dunes. Interest in the beach sands industry has increased, due to rising world prices. International capital, mainly from the US, has been invested in locally registered mining companies during the last three years.

French Polythene

Two new factories are to be built at or near Gonfreville, near Le Havre, for the production of polythene. The present consumption of polythene in France is 7,000 tons annually of which 4,000 tons is home produced.

Indian Newsletter

trialists. The Bombay Dyeing & Manufacturing Co. Ltd. evinced keen interest and the new company was born.

The process employed in the Bombay factory is the electrolytic one. The modern method of manufacturing hydrogen peroxide is a cyclic operation comprising an electrochemical stage followed by the distillation process. As the manufacture involves the handling of highly corrosive and oxidising liquids, a variety of corrosion-resisting materials, such as plastics and earthenware, have been widely used in the plant. A battery of electrolytic diaphragm cells produces the persulphate solution which is evaporated and hydrolysed in a suitable boiler, and then the evaporated liquor and vapour are passed to a stripping column. The hydrogen peroxide vapour leaving the column passes to a rectifier and a solution of 35 per cent hydrogen peroxide is run off at the bottom. Two 50-ton capacity hydrogen peroxide storage tanks made of pure aluminium are used to store the chemical. It is reported that India may become self sufficient in requirements of hydrogen peroxide with production from the new plant.

Hungarian Factory

WORK begins this month on a new £12 million straw cellulose factory at Sztálinváros, Hungary. The factory will manufacture sulphite cellulose from rice straw and is scheduled to start production at the end of 1958. About 200 tons of straw will be processed daily, more than 64,000 tons a year. Factory equipment is to be imported from Finland and the German Democratic Republic, though some Hungarian-made machinery will also be used. When in full production the factory will produce 44 per cent of the straw cellulose (to-day mostly imported) used by the paper industry. This, it is estimated, will save about two million dollars a year in imports.

Primary Decyl Alcohol

Primary decyl alcohol, claimed to be of a purity previously unavailable, is being produced at the Texas City, Texas, plant of Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp. Due to improved production techniques, primary decyl alcohol will be sold under tighter specifications. The maximum aldehyde content of the product will be lowered from 0.20 per cent to 0.05 per cent and colour from 15 to 10 on the platinum-cobalt scale.

Detergents Developed in US

The development department of American Alcolac Corporation are field testing a series of new nonionic detergents, which chemically are polyoxyethylene fatty alcohols. These detergents, designated Siponic E-1 to E-5, are stated to be stable to heat and to be unaffected by highly acid or alkaline media. They are not expected to compete with nonionics in general but, because of their unusual properties, they should have certain special applications.

Anti-Corrosive Rubber

Newly developed synthetic rubber substance Ameripol SN (THE CHEMICAL AGE, 23 June) is claimed by the makers, B. F. Goodrich Industrial Products Company, to duplicate natural rubber. Its use for the handling of corrosive chemicals is said to be 'definitely possible.'

Poland to Make Synthetic Rubber

Poland's first synthetic rubber factory, built with the help of the Soviet Union, will, it is claimed, be the largest in Europe. The factory is expected to start production soon.

Protection Against Corrosion

Special Painting System Adopted

Interest is being shown in the protection problems solved in the exceptionally corrosive conditions at the Manvers Main Colliery of the National Coal Board near Doncaster. The large development works in progress at this colliery are part of the work undertaken on 30 new collieries and 137 major reconstruction schemes either complete since Vesting Date, 1 January 1947, or in progress.

WORK at Manvers Main includes the construction of 78 new coke ovens which, with the existing battery of 62 ovens, will make this one of the largest coke and by-products manufacturing plants in the country. The chemicals produced in the by-products works from gas generated in the coke ovens will include many varieties of benzole and tar by-products in addition to the usual ranges of processed chemicals.

The structural steel storage tanks and process equipment involved in all this is under unusually severe attack. The atmosphere is constantly polluted with fumes of sulphuric and other acids sent out from the quenching section of the coke oven plant at regular intervals of about 20 minutes, day and night without ceasing. There is additional direct attack from spillage of highly corrosive liquids in the by-products plant, and further attack from corrosive material deposited on exposed surfaces by rain falling through atmospheres heavily charged with the sulphurous and other compounds.

The answer would be to remove these substances before they can escape to the air, but the cost involved would be prohibitive and out of all proportion to the benefits gained. It is, therefore, in a finishing paint system that the answer must be sought and it is claimed that the painting scheme devised by Evode Ltd., Stafford, with the full collaboration of the contractors, will ensure that furture cost of maintenance will be as low, and resistance to attack as high, as it is anywhere possible to guarantee.

Particular Systems

It was at once clearly impossible to devise a paint system suitable for the whole of a site as large as Manvers Main and it was therefore necessary to produce specific systems capable of withstanding particular conditions.

From the early stages of investigation and research a number of unusual complications had to be surmounted. Wind encountered when painting the exposed parts of conveyor structures and the tops of trestles, for example, caused the paint surface to dry very rapidly, with the result that bubbles of air were trapped on the painted surfaces. These later developed pin-holes and thereby gave inadequate protection. This problem was overcome by developing a special solvent blend, so that the paint film remained fluid long enough for these bubbles to burst and the film to flow.

Four-Coat System

The use of Evoled and Evodyne was recommended, the specification being varied in accordance with the site conditions and making reasonable allowance for corrosive attack of exceptional severity in certain places. Thus a four-coat painting system was proposed for every item of plant near the coke ovens. The first coat is of Evoled red lead primer. This is then covered by a barrier coat of Evodyne aluminium paint, which provides a highly impermeable barrier to water and aqueous solutions.

The third coat is an undercoat of Evodyne chlorinated rubber paint, produced from natural rubber to which chlorine is added. It is highly resistant to attack by alkalis and acids. Finally, the finishing coat is of similar material in the required shade differing from the undercoat to provide identification of each coat.

On those parts of the plant where corrosive conditions are not so severe, such as the interior steelwork of conveyors protected on the outside by asbestos cement corrugated sheeting, Evoled primer was used with two coats of Evodyne chlorinated rubber paint.

Experience has proved that both these painting systems have good resistance to

Corrosion Prevention

corrosion, and that Evoled primer adheres strongly to a clean and well prepared steel surface, providing a perfect bond for the subsequent finishing coats and particularly for the barrier coat of aluminium paint. Evoled also performs the very important function of an active rust inhibitor, since one of its main constituents is a pure non-setting red lead.

The barrier coat of Evodyne aluminium paint provides an impermeable protective film against the entry of moisture should there be a breakage in the outer protective paint.

The reason for selecting chlorinated rubber paint for the system is because this material is claimed to have lower permeability to water than any other surface coating, from which it follows logically that it is highly resistant to both acids, alkalis, and to all corrosive aqueous chemical solutions.

Chemical Attack

The great danger, in this atmosphere, is the inevitability of normal paint systems to be subject to chemical attack before they have dried, or during the course of application.

Experience has proved that Evoprene successfully resists chemical attack while the paint film is still wet, and that it is resistant to a moderately high temperature, as opposed to chlorinated rubber paint which is not recommended where the temperature is even moderately warm. Accordingly, Evoprene has been applied to the condensers and to those parts of the ram charging car which face the retorts. In this particular case, Evoprene aluminium primer has been followed by two coats of grey or black paint of Evoprene type.

It was essential that certain parts of the benzole rectification plant should be highly resistant to corrosive attack by solvents such as benzole, pyridine and carbon disulphide. These materials are solvents for chlorinated rubber so that paint containing this substance is not suitable for protection of this plant. Evonamel SR paint proved the answer. It has been shown to give maximum resistance to solvents at reasonable cost.

As in all painting work, success at Manvers Main was to a large degree dependent on proper application of the paint, which in turn required fulfilment of three conditions. Firstly, the surface of the steel had to be clean, free from gases and mill scale. Secondly, although Evoled can be successfully applied to a moist surface, it is important that the highly impermeable Evodyne chlorinated rubber paint be applied to a perfectly dry surface. Thirdly, the film must be continuous and of adequate thickness. Minimum thickness of film, it was laid down, should be 0.005 inch—simply checked by a non-destructive magnetic film thickness gauge.

Furfural Refining Unit

A FURFURAL refining unit for the treatment of virgin gas oil cracking stock, claimed to be the first of its kind in the world, is now 'on stream' at the Texas Co.'s Los Angeles works. The unit has a gas oil charge capacity of 25,000 barrels per operating day and the process gives a yield of about 94 per cent of raffinate, which is charged to a fluid catalytic cracking unit. The furfural refining process is said to decrease the sulphur content of the virgin gas oil, extract metal contaminants, and reduce the aromatics content, thus improving both the quality and yield of gasoline produced in the fluid catalytic cracking unit. It is also claimed to reduce operating costs by increasing the life of the catayst.

Peruvian Atomic Energy

An agreement was recently signed in Washington between the Peruvian and US Governments for co-operation in atomic energy questions and providing for the supply of a nuclear research reactor to the Peruvian Atomic Energy Board, at a cost of $700,000, half of which would be paid by the Peruvian Government and half representing a grant from the US. The US Atomic Energy Commission will send technicians for the installation and operation of the reactor. Provision is made in the agreement for the supply of the necessary fuel.

Turkish Oil Pipeline

Completion of the 22.5 km. pipeline from Raman Dag to the Batman refinery is reported. The 25 km. pipeline which will connect the Garman oilfield with Batman was due to be completed in July. It is claimed that when both these pipelines are in full operation, the Batman refinery will save Turkey $12 million a year in foreign currency.

European Convention

DECHEMA Arrangements Under Way

PREPARATORY work on the European Convention of Chemical Engineering, Frankfurt am Main, 31 May to 8 June 1958, is well under way. The convention is to be held in connection with the ACHEMA 1958 12th Chemical Apparatus and Equipment Congress and Exhibition.

The second congress of the 23 European technical and scientific societies which together form the European Federation of Chemical Engineering will be held within the framework of the Convention. This congress will open in Brussels (28-30 May 1958) and will continue in Frankfurt (31 May-8 June 1958).

Also to take place during the Convention are the second congress of the European Federation of Corrosion, a special meeting of the 'Gesellschaft Deutscher Chemiker' (German Chemical Society) and DECHEMA will hold its 33rd annual general meeting. Finally DECHEMA will conduct an International ACHEMA students meeting to which advanced students of chemistry, physics and chemical engineering will be invited.

Thirteen large exhibition halls having a total floor space of 66,000 square metres are available at Chemical Apparatus and Equipment Congress and Exhibition. At the moment practically the whole of this floor space has been taken up by 620 exhibitors and it is reported to be very doubtful whether all requests for exhibition space at the forthcoming exhibition can be met.

Both the European Convention of Chemical Engineering and the ACHEMA Chemical Apparatus and Equipment Congress and Exhibition are organised and conducted by the DECHEMA Deutsche Gesellschaft für chemisches Apparatewesen EV in Frankfurt am Main.

Uranium Deal With Canada

Shortly before going to press, we learned from a Canadian source that a United Kingdom negotiating team was expected to sign almost immediately a multi-million dollar uranium purchasing agreement with Canada. Mr. W. J. Bennett, president of the Crown-owned company Eldorado Mining and Refining Company and head of Atomic Energy of Canada, who recently spent some time in Britain discussing a uranium contract, is the chief Canadian negotiator.

'Non-Dangerous' Goods

CARRIAGE of 'non-dangerous' goods often involves damage to the package and its contents. To minimise this risk a new British Standard, *Recommendations for Pictorial Marking of Handling Instructions for Non-Dangerous Goods*' (BS 2770) has been prepared, and copies are available from the British Standards Institution, 2 Park Street, W1, price 3s.

It recommends the use of pictorial markings on containers, which provide at-a-glance instructions to all concerned with handling a package during transit. Thus *Fragile—handle with care* is expressed by the stylised symbol of a slender-stemmed wine glass. There are other marks suggested for: Use no hooks—do not puncture; This way up; Keep cool—stow away from boilers; Sling here; and, Heavy weight this end.

Symbols illustrated in the standard are in form of stencil markings and provide a basis for making suitable stencils. This sign language should prove of value overseas where language differences arise or where handling personnel cannot read. Safer delivery of goods from one part of the world to another should be ensured. It has been proposed that the International Organisation for Standardisation (ISO) should study this subject with a view to preparing internationally acceptable pictorial markings.

Fine Particle Insecticide

TO OBTAIN the finest possible particles of powders, used in the manufacture of insecticides and pesticides, ICI (Australia & New Zealand) Ltd., has recently installed a special grinding machine at its plant at Villawood, New South Wales. A unique feature of the machine is that no dust is produced during the actual grinding operations, which take place in a unit, known as the 'Micronizer'.

A small chamber receives the total output of compressed air from the 125 HP compressor. High velocity jets of air impinge on the coarse material, and break it up into the finest particles. The air, carrying the pulverised particles, then goes through a blow-back filter where the air passes on and the particles fall out. Fine particle size is necessary for insecticides etc., as insects have mouths which can take only the smallest grains.

Safety Notebook

FOLLOWING is a list of new exhibits and photographs at the Industrial Health and Safety Centre, Horseferry Road, London SW1: This is made available by the director of the Centre: Continuous towel machine. *Initial Towel Supply Co.*, Goswell Road, London EC1; Small collapsible trolley for carrying up to 2 cwt. *Fabrique du Metal*, Sunbury-on-Thames; Hard hats. *Malcolm Campbell (Plastics) Ltd.*, 5 Great James Street, London WC1; Display of 'tube-gauz' bandages. *The Scholl Mfg. Co.*, St. John Street, London EC1; Five seats mounted in rubber. *New-Parq Ltd.*, 14 Commercial Road, Southampton; (replacement). Electric mixer with attachment. *Hobart Mfg. Co.*, London N11; Section of aluminium ladder showing a better method of fixing the rungs. *Lyte Ladders*, Newport, Mon; Display board of enamel warning notices. *Defiant Enamel Co.*, John Penn Street, London SE13; Automatic guard for a vertical drill (and photos). *Enfield Rolling Mills*, Brimsdown; Goggles (and photo) which saved eyes in an iron works; Special ratcheting spanner. *Bancroft Engineers*, 5 North Road, Preston; Goggles containing a small amount of water which can be shaken across the lens for demisting; *Siebe Gorman & Co. Ltd.*, Chessington, Surrey; Water control float which exploded when being repaired; Display board of hose clips with tools. *Matchless Machines*, 13 Tottenham Court Road, London W1; Display board of special type spring fasteners. *Oddie Fasteners*, Southampton; Grooved rubber mat for use at machines. *James Walker & Co. Ltd.*, Woking; Step ladder which folds flat and a step-stool with padded top. *Arnex Products*, Kings Norton, Birmingham 30; Set of 'chafeguards' to prevent damage to corners of loads by wire or chain slings. *H. C. Slingsby Ltd.*, 89 Kingsway, London WC2; Dry powder chemical fire extinguisher *The Pyrene Co. Ltd.*, Brentford, Middx; Mat of p.v.c. links for use in corrosive atmospheres. *Whitby & Chandler*, Brunswick Street, Sheffield 3; Display board of earthing clamps. *M. Mole & Son*, Charlotte Street, Birmingham 3; Double abrasive wheel bench grinder on stand, with eye screens and low voltage lighting. *E. C. Hopkins*, Grosvenor Street West, Birmingham 16; Two adjustable stools. *H. R. Turner*, Short Heath, Willenhall.

Photographs

Stand container for dangerous liquids. *Humber Ltd.*, Coventry; Portable guard rails for holes in floors. *Central Electricity Authority*, London; Special fume cupboard. *Distillers Co. Ltd.*, Epsom; New medical department (six photos). *Ilford Ltd.*, Ilford; Accident at the intake of a conveyor belt; Luffing jib cranes and platform of overhead crane (three photos). *Babcock & Wilcox Ltd.;* Bad parking of a hand trolley—accident; Access ladder with safety hoops. *Cadbury Brothers Ltd.*, Bournville; Long bogie-mounted callipers for handling small crucibles; Burst grinding wheel (two photos); Hoist for lifting heavy patients from floor to stretcher etc. (three photos). *Salisbury Engineering*, Buckingham Palace Mansions, London SW1. Machine transporter for low loading (three photos). *APV Co. Ltd.*, Manor Royal, Crawley; Abrasive wheel guards of good design. *ICI Ltd.;* Loose clothing caught on shaft; Lamond stretcher carrier (seven photos) for moving injured persons down stairways etc. *North Thames Gas Board*, Staines; Precautions in use for radio-active isotopes (three photos). *Unit Super Heater & Pipe Co.*, Swansea.

ABCM Directory

THE Association of British Chemical Manufacturers has issued the 1956 supplement to the 1955 edition of its directory, *British Chemicals and their Manufacturers*. The directory is published every two years and during this time there are inevitably many changes and additions in the list of products produced. This supplement provides full details of these changes and will ensure that the users of the 1955 directory have up-to-date information on the actual manufacturers of chemicals in the UK. Copies of the supplement are available, free of charge, to all firms or persons genuinely interested in the purchase of chemicals. Enquiries should be addressed to the Association at Cecil Chambers, 86 Strand, London WC2.

Courses on Dyeing

BRADFORD Further Education Sub-Committee, in conjunction with the Yorkshire Council for Further Education, is arranging courses of lectures on (a) general chemistry and properties of organic high polymers, and on (b) theories of colour, colour measurement and colour assessment.

Course (a), which will comprise 26 lectures, will be held in the Technical College, Bradford, on Wednesday evenings at 7 p.m., commencing 26 September 1956. Course (b), comprising 26 lectures, will be held in the College on Friday evenings at 7 p.m., commencing 28 September.

Dr. W. R. Moore, senior lecturer in physical chemistry, will be the lecturer for course (a) and Mr. R. B. Bentley, lecturer in physical chemistry, will be the lecturer for course (b).

These courses are particularly designed to present developments in the general chemistry and physical chemistry of high polymers (particularly the synthetic and man-made fibres), and of colorimetry. Both courses will be found of value to those preparing for the examinations for A.S.D.C. (Papers A and B) and course (a) will be of value to those preparing for the A.P.I. (Section A (iv)).

Each course may be taken separately. The fee for each section is £1 15s.

Fuel Storage Negotiations

Negotiations are being carried out between Shell-Mex and BP and the Belfast Harbour Commission for the acquisition of a site to extend the group's Belfast installation and increase its fuel storage capacity. The site is reported to cover about 23½ acres. Recently the group acquired a 40-acre site at Londonderry for the extension of its installation there.

Atoms Aid Rubber Industry

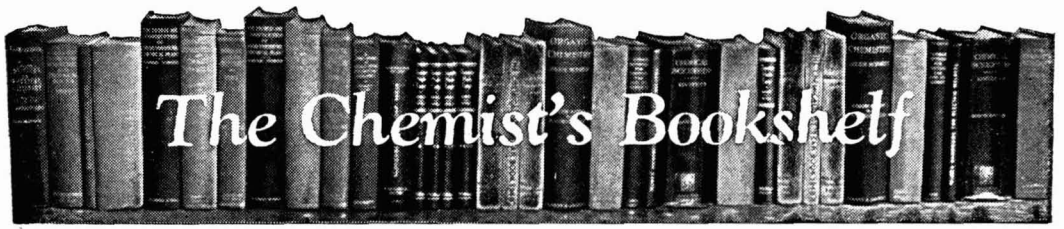
A SPECIALLY designed laboratory, the first in the British rubber industry, for the irradiation of rubber and plastics, has been completed at Dunlop Research Centre, Birmingham. Close co-operation has been maintained with the Atomic Energy Research Establishment at Harwell on all the constructional details and technical points involved.

Sources of Radiation

'National scale developments of atomic energy have so enormously increased the availability of sources of radiation,' says Mr. E. A. Murphy, director of research, 'that it is now possible to envisage their application on an industrial scale. 'Work with a 100 curie source of cobalt-60 obtained from Harwell is about to start, and later a full source of about 1,000 curies will become available. The fact that irradiation by gamma rays from a radio-active source can cause cross-linking of the molecules suggests possibilities of carrying out vulcanisation and other reactions which may not easily be attained by other methods; and the opportunity of dispensing with ordinary chemical methods, or of vulcanising previously incompatible or non-vulcanisable materials, promises new types and ranges of synthetic polymers.'

Mr. Murphy goes on to explain:

'The contribution of the atomic energy programme in this country takes two forms: The great stimulus it has given to the commercial development of particle accelerators, and the large quantities of radio-active isotopes available as by-products. There is an interesting parallel here with the development of dyestuffs and other chemicals as a consequence of the by-products developed in the past in the gas industry.'



PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY. Volume 14: *General Aspects of the Use of Radioactive Isotopes: Dosimetry*. Compiled and Published by the United Nations Scientific Secretariat, New York. 1956. Pp. 305. 45s.

The list of titles in this conference series of 16 volumes suggests that kindred material may be found in several other volumes viz. Volume 10, 'Radioactive Isotopes and Nuclear Radiations in Medicine'; Volume 12, 'Radioactive Isotopes and Ionizing Radiations in Agriculture, Physiology and Biochemistry'; Volume 15, 'Applications of Radioactive Isotopes and Fission Products in Research and Industry'; Volume 7, Nuclear Chemistry and the Effects of Irradiation; and, possibly, Volume 11, Biological Effects of Radiation. The dust-jacket introduction fairly indicates that this volume contains 'Technical papers and discussions describing production, handling and distribution of radioisotopes. Full consideration is given to the techniques that have been developed for the measurement of detailed properties of the various radioisotopes, including monitoring in industrial situations'. Additionally, the first part of its content (some 60 pages) is devoted to review articles which outline quantities of radioisotopes used (in an attempt to impress?) and the applications they find in nine countries. Its contents, therefore, fit this volume to lie earlier in the sequence; at the latest, volume 10.

Insufficient References

The review articles awaken interest, but in many cases give insufficient references. For example, Dr. Seligman mentions the recent development of a device capable of selecting and measuring low energy gamma rays. This, he said, may be applied to the detection of such rays as are scattered when the original gamma beam penetrates a pipe and, since corrosion in the pipe will affect the degree of scattering, thereby offers a means of estimating pipe corrosion without shutting plant down. The accuracy of the method was indicated approximately in the discussion which followed but is there any more information in volume 15?

The next section outlines the production and chemical separation of radioactive materials, leading on to the preparation of specific sources and their subsequent transportation. Several papers deal with the handling of Kilocurie sources. One suspects that techniques of similar interest form part of papers grouped elsewhere in this series.

Radiation Dosage

The final section devotes 150 pages to the problems of measuring radiation dosage. Papers discuss 'The Role of Liquid Scintillators in Nuclear Medicine' and 'Visualization of Isotopes in the Body'—large specialized medical instruments. A paper details the 'Measurement of Tissue Dose as a Function of Specific Ionization'. The humble personal monitoring film is only mentioned incidentally, though details are given of the application of a thin photographic film for autoradiographic work of high resolution. A long paper reviews monitoring and control systems for airborne contamination and a portable beta-ray dosimeter in also described. There is a review of instruments applicable to the problem of 'low-level' counting encountered in dilute tracer studies where one must discern proportionately small counts against the background. Several papers, needless to say, deal with neutron detection problems.

During the Conference, series of meetings ran simultaneously. This is naturally reflected in the Conference record which follows a programme that often had to divide allied topics. Especially, does this become evident with a principal sub-topic like the application of radioactive isotopes. In reviewing this volume, the need for a detailed index to the whole series has been felt increasingly.—J.S.M.B.

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur

Mortgages & Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages or Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary but such total may have been reduced.)

EVODE LTD. Stafford, chemical products etc.—27 July, further charge, to Atlas Assce. Co. Ltd. (supplemental to a charge dated 30 January 1956), securing £15,000 also £35,000 secured by principal security due jointly from the Co. & English Waxes Ltd.; charged on property charged by principal security & policies. *£35,000. 20 March 1956.

Satisfaction

BRITISH CELANESE LTD. London W.—Satisfaction 3 August, of deb. stock reg. 2 October 1943 & 8 November 1944 to the extent of £10,843.

Increases of Capital

PHARMACEUTICALS (MANCHESTER) LTD. (535,303), 10 Marsden Street, Manchester 2, increased by £4,000, in £1 ordinary shares, beyond the registered capital of £1,000.

STRATTON CHEMICALS LTD. (559,002), 17 Stratton St., London W1, increased by £24,900, in £1 ordinary shares, beyond the registered capital of £100.

New Companies

Ennis Engineering Co. Ltd.

Private company. (16,180). Registered in Dublin 16 July. Capital £5,000 in £1 shares. Objects:— To carry on the business of mechanical, electrical and chemical engineers etc. The subscribers (each with one share) are:— Dermot Guinan and James Sheehan, both solicitors of 1 Clare Street, Dublin. The first directors are not named.

Metemicals (Cannon) Ltd.

Private company. (570466). Registered 17 August. Capital £6,000 in £1 shares. Objects:— To carry on the business of buyers and sellers, importers and exporters and manufacturers of and dealers in all kinds of chemicals and chemical products and by-products, etc. The first directors are:— Curt C. H. Niemann, 53 Burkes Road, Beaconsfield, Bucks, Frank A. Meyer, 12 Russellcroft Road, Welwyn Garden City, and Walter R. Cogger, 101 Gloucester Road, Tottenham.

Company News

Celanese Corp. of America

Celanese Corporation of America have reported for the first six months of 1956 a net income of $6,185,602 after charges and taxes, equivalent to 65 cents a common share after preferred stock dividends. This compares with $7,221,797 (equivalent to 83 cents a common share) for the corresponding period last year. Included in the first six months of 1955 was a non-recurring profit item from sales of investments equal to 13 cents a share after taxes. Net sales for the first half of this year amounted to $94,421,267 compared with $93,248,262 in net sales for the comparable 1955 period. Second quarter sales this year totalled $45,943,380. Mr. Harold Blancke (president) states that facilities are being expanded to increase the production of the new Celanese triacetate fibre, Arnel. Mr. Blancke further relates that production has begun in the company's new chemical plant at Point Pleasant, W. Va., and new plastic film casting facilities at Belvidere, NJ. The company has acquired from Celatino, SA, a Panamanian subsidiary, its investments in Celanese Mexicana, SA, and Celanese Colombiana, SA, with the result that future corporate profit reports will include such income as may be realised from these investments.

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Company News

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Ceramic Holdings

The directors of Ceramic Holdings are offering to the ordinary shareholders 400,000 ten shilling ordinary shares at 10s per share. It is expected that provisional allotment letters will be posted on 4 September. The offer is being underwritten by Cazenove & Co., in London, and by S. M. Penney & Macgeorge, in Glasgow.

Cockburn & Company

A profit of £9,729 was made by Cockburn & Co., manufacturing chemists, during the year ending 31 March 1956. This compares with £10,564 for the corresponding period last year. A dividend of 15 per cent has been declared, against 20 per cent in 1955. Directors state that sales increased throughout the year under review, but rising costs caused a slight recession in trading profits. The annual meeting is to be held in Glasgow at 11 a.m. on 17 September.

Kern Oil Co.

The directors of Kern Oil Co. have decided to recommend the capitalisation of £240,750 of general reserve for a scrip issue of one new 4s share for every five existing stock units. Subject to Treasury consent, the necessary resolutions will be proposed at an extraordinary meeting immediately after the annual meeting in December.

Major & Company

Final dividend of 7½ per cent, making 12½ per cent for the year to 31 March 1956, is announced by Major & Co. (chemical manufacturers, tar distillers etc.). Consolidated profit, after tax, is £35,867, of which £8,525 is attributable to outside interests.

Pinchin Johnson & Associates

Production, sales and net profit records were again achieved by Pinchin Johnson and Associates, paint, enamel etc., manufacturers, in the year to 31 March last. Group net profits, after tax, were £863,885, compared with £825,513, with the total dividend recommendation of 16 2/3 per cent. The annual meeting is to be held on 11 September at the Connaught Rooms, Queen Street, WC.

Pretoria Portland Cement Co.

An extraordinary meeting of the Pretoria Portland Cement Co. is called for 14 September, in Johannesburg, to create capital and authorise a new issue of shares. The circular details development plans estimated to cost £2,085,000. In addition, the company must also allow for exercising any rights it may have in the provision of fresh capital which Cape Portland Cement Co. proposes to raise.

MARKET REPORTS

LONDON New demand for industrial chemicals on home account, although more active than during the holiday period, is inclined to be slow. Contract deliveries are, however, being taken up in fair quantities and inquiries for shipment continue at a good level. Apart from the fluctuations in the metal market which affect the chemical compounds, there have been no important price changes. Items in active request include hydrogen peroxide, the barium compounds and the technical and photographic grades of hyposulphite of soda. Borax and boric acid are moving well following the announcement of a £1 per ton increase from 1 October. Cresylic acid, carbolic acid and creosote oil are in good request among the coal tar products. The tone of the market continues firm.

MANCHESTER The seasonal effect of holiday stoppages at the consuming end has been less in evidence on the Manchester chemical market during the past week. Contract deliveries of the alkalis and other heavy chemical are now showing signs of a gradual return to normal. The demand for textile and allied chemicals has been on a fair scale and most other industrial outlets are taking reasonably good deliveries. Quotations are on a firm basis pretty well throughout the range. The movement of fertiliser materials has again been on a moderate scale, with steady demand reported for most of the light and heavy tar products.

GLASGOW A rather more satisfactory week's trading has to be reported from the Scottish heavy chemical market, although there is a tendency to quietness in certain sections of industry. No important change in prices has to be reported and these generally have been firm. The export market still continues at a good level and numerous enquiries are being received.

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