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# The Chemical Age

VOL. LXXVI No. 1950

24 November 1956

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(See page 331)

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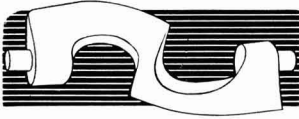
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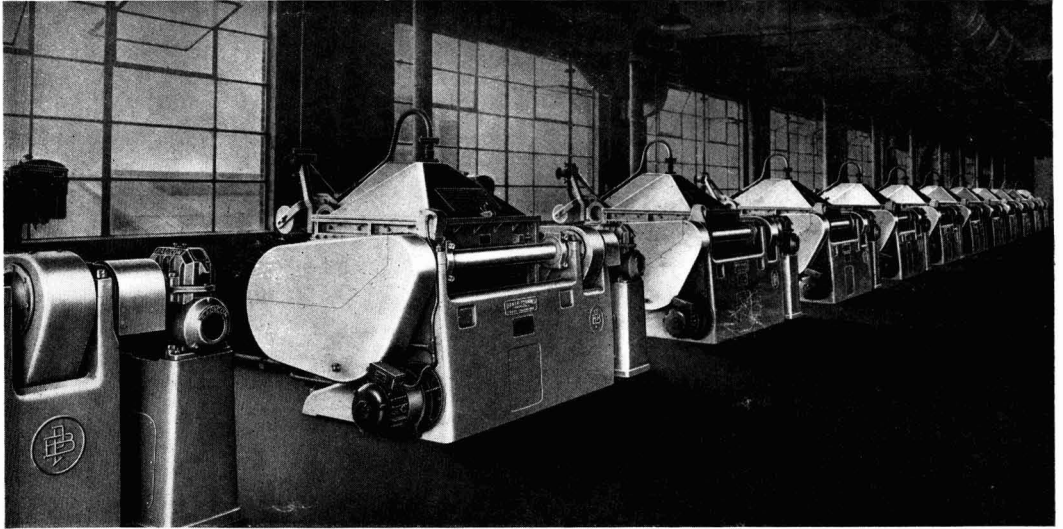
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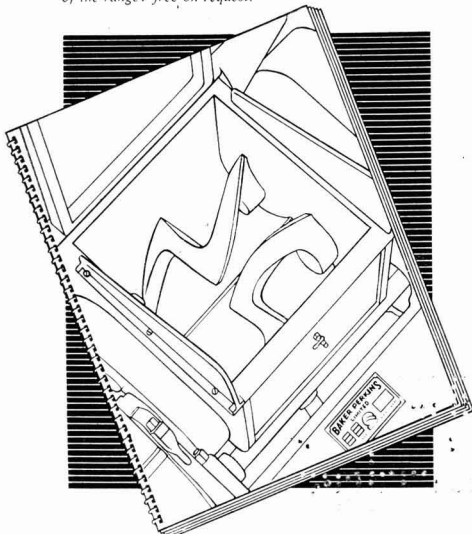


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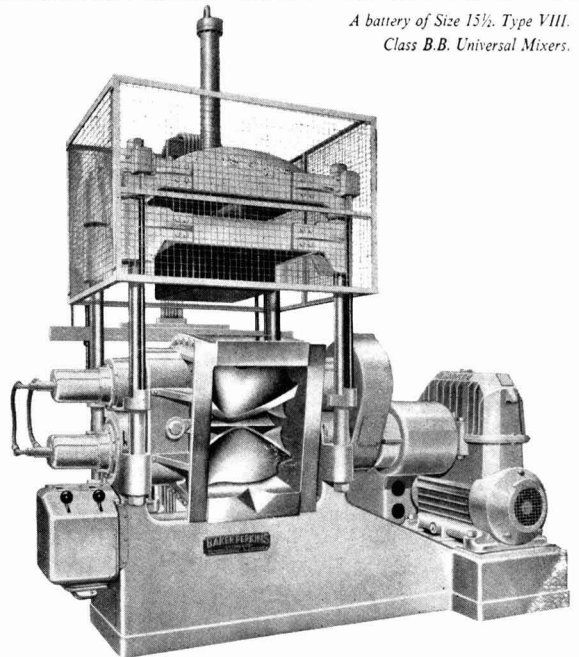


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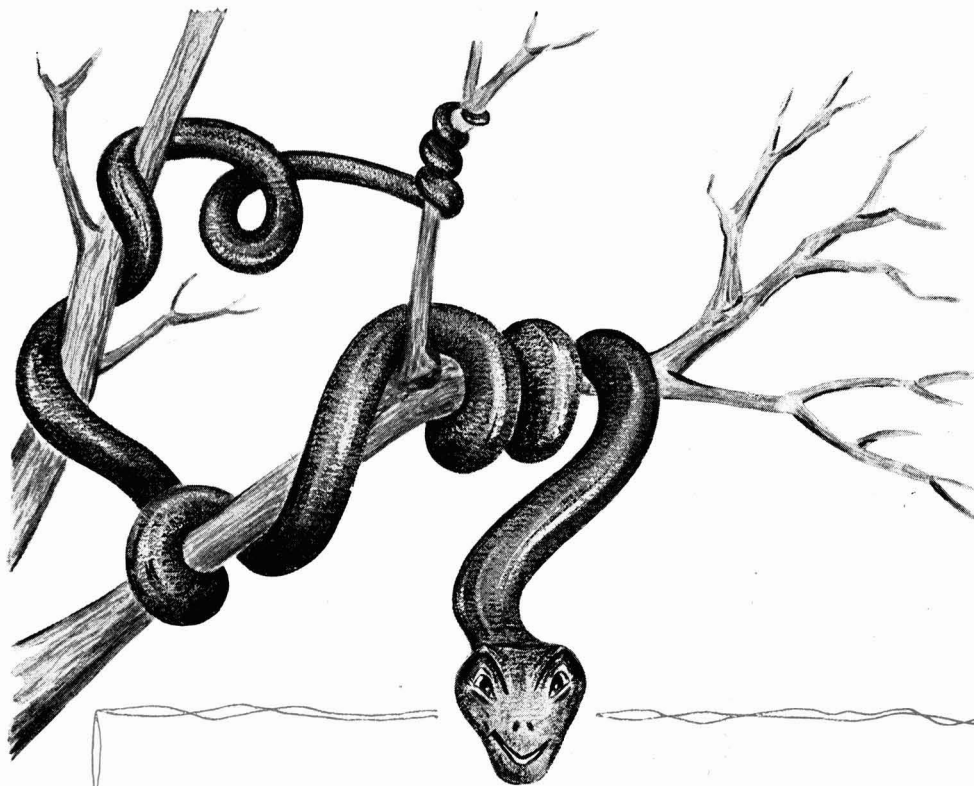
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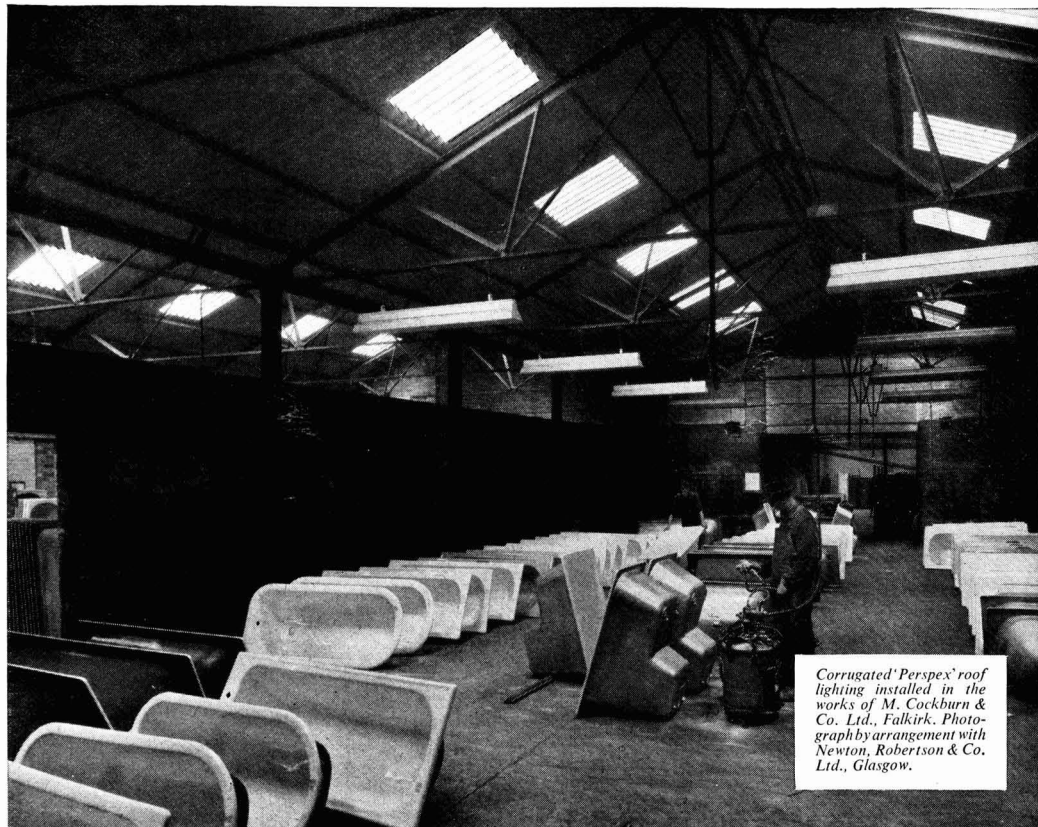
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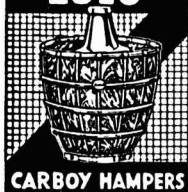
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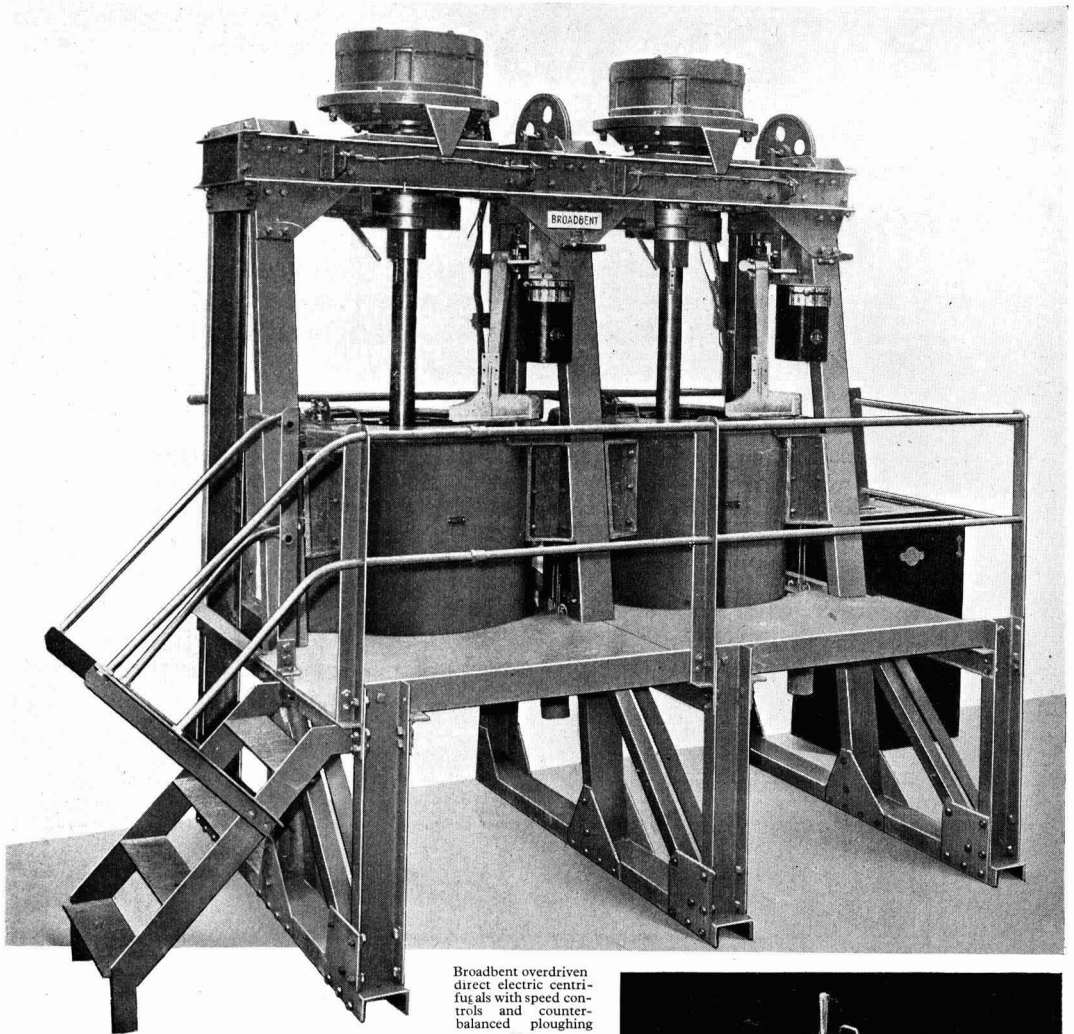
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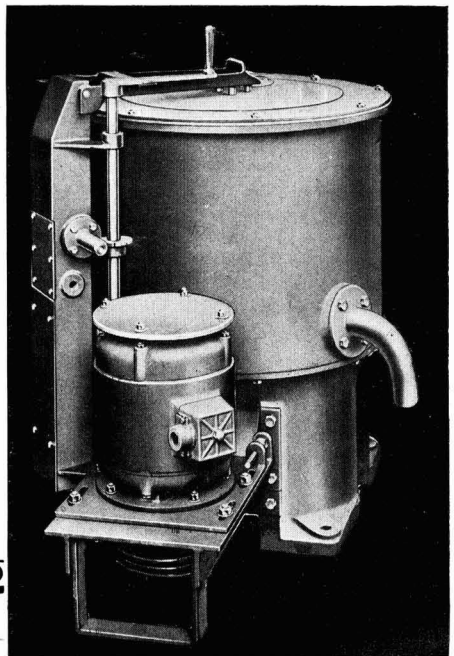
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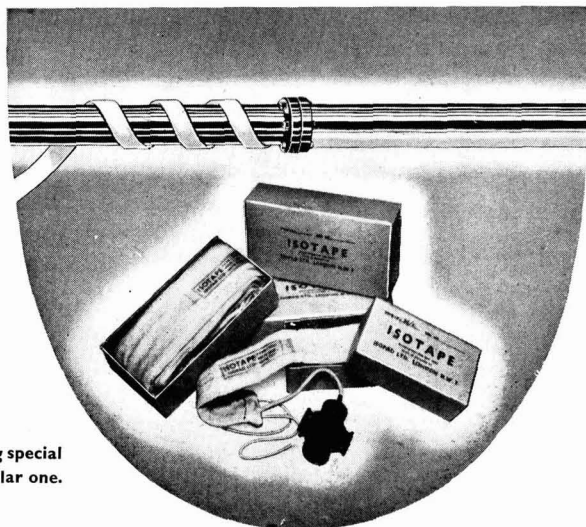
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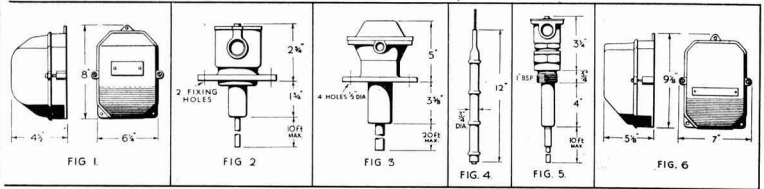
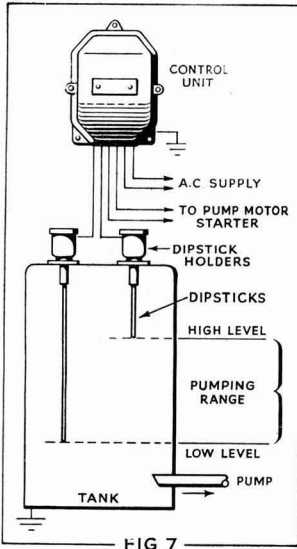
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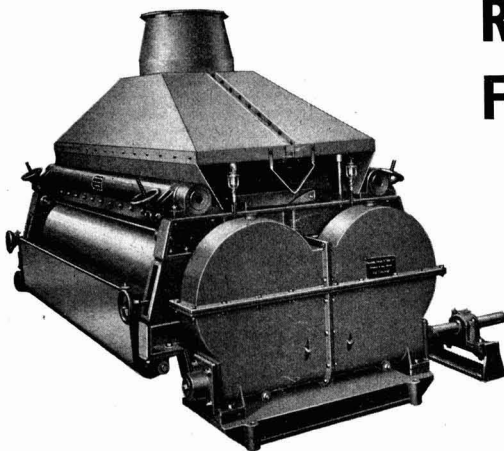
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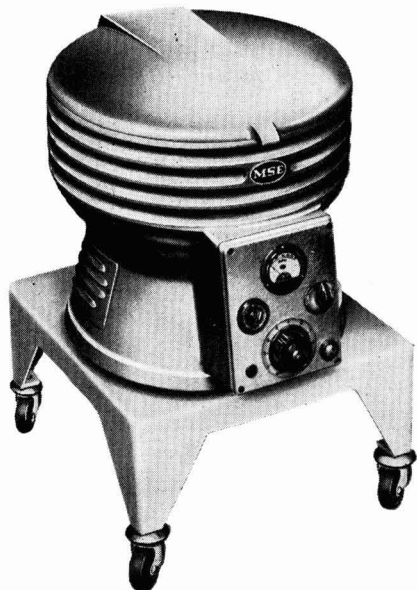
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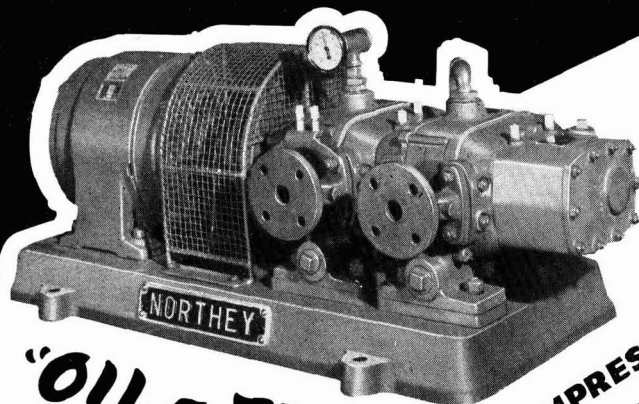
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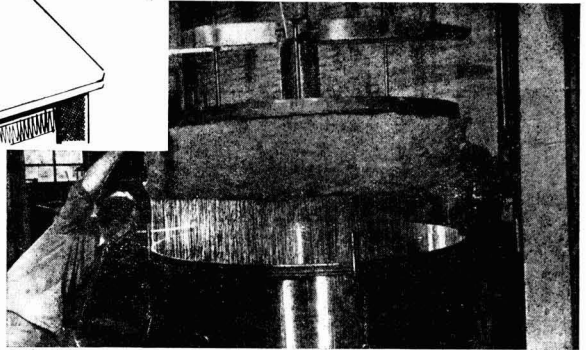
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# THE CHEMICAL AGE

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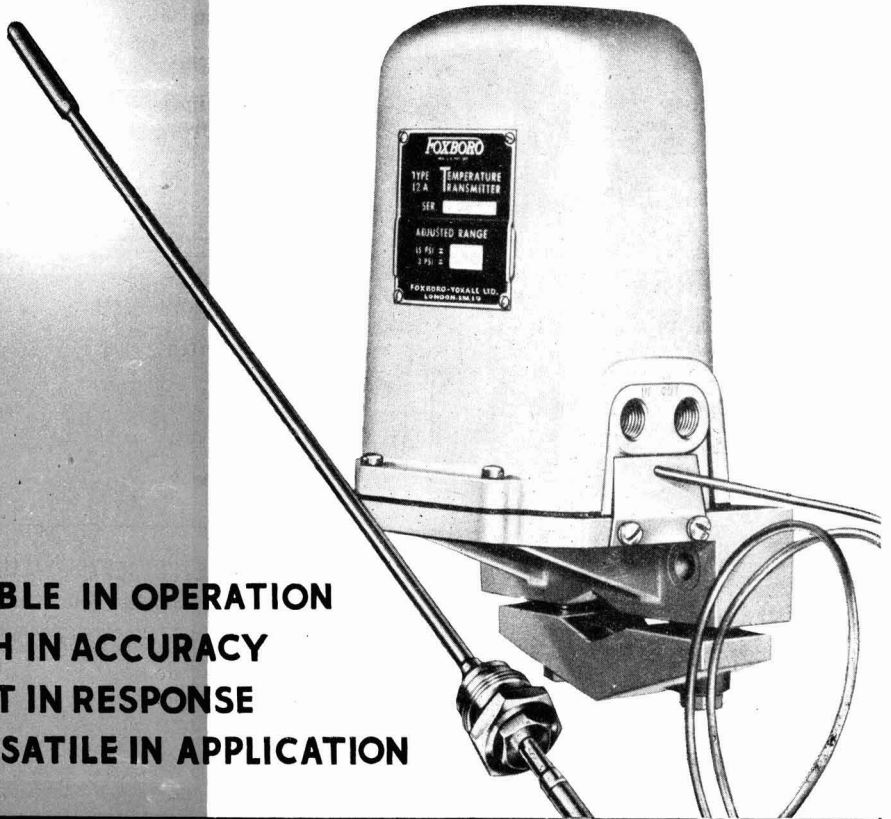
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## VIEWPOINT

# Chemical Leadership

**L**AST WEEK at Brighton there was a three day conference of quite exceptional importance. An eminent and authoritative gathering of delegates and speakers discussed the place of agriculture in the British economy. Not only was agriculture represented by well-known farmers and in the collective shape of the NFU, but economists, bankers, scientists, and industrialists all threw their views into the mill of debate. It was generally agreed at the end of the conference—even by experienced participators in such events—that intensity of discussion achieved an unprecedented peak.

To deal with an agricultural topic in a chemical journal may—at any rate to this point—seem only marginally relevant. In truth, however, this conference was a triumph of chemical industry leadership, for it was not sponsored by one of the scientific or farming societies, nor (as it might have been) by the Government—it was sponsored by Imperial Chemical Industries Ltd. No expense or trouble was spared in organisation and hospitality. Indeed, months of preparation had been invested in gathering together over 200 delegates and speakers, blending eminence of knowledge with representation of all major influences in agriculture and national economy. That a predominantly chemical company should have called and financed this event was an act of great imagination, and it would be small-minded to look upon it as a mere stratagem in publicity. Certainly no one present could have held this opinion for long.

When Sir Alexander Fleck, chairman of ICI Ltd., made the final comments from the platform last Saturday morning, he said: 'It has been suggested that it was not the business of an industrial organisation to call a conference of this sort and that it should have been left to some official body to do so. I did not agree with that point of view for this reason. We are an industrial concern, vitally interested in providing agriculture with some of its basic requirements. We therefore feel a great responsibility for making certain that first we know the quantities of those basic requirements, and second that, shared as they no doubt will be by others, steps are taken to meet those requirements over the next 10 years which form the period that has been under review. Now that the conference has ended, I am more than ever convinced that we were right to convene it.'

The vigorous proceedings at Brighton—and not least the contributions from the floor—cannot now be ignored in any responsible quarter. If the proportionate place of British agriculture in the national economy

remained throughout a subject of fervent argument, there was undoubtedly general agreement that the present domination of February-to-February price reviewing is *not* a policy—nor is it a system that suits the nature of farming. There must instead be what Sir Alexander called 'a combined technical, economic and financial policy.' Indeed, as the next step, and as a logical result of the conference's work, he suggested that a small body should be appointed by the Government to make a broad survey of British agriculture.

Mr. Stephen Cheveley, chairman of ICI's central agricultural control, gave his prescriptions for agricultural development in the next 10 years; these included an intensification of production from good arable and grass lands—he excluded marginal land; production of more meat, and greater expenditure on research. These remarks will not be lost on the chemical industry because they suggest trends which may have considerable effect on agricultural chemicals in the years to come. The economists assume that the future holds an expanding market for food in the next decade. British agriculture may win a good part of this, so for agricultural chemicals the future seems bright.

Those who were present probably shared Sir James Turner's remark at the conference dinner that 'we have learnt how little we all know.' If economists remained true to form in the extent of their disagreements, all of them gave to agriculturists a new picture of the national economy in which farming must achieve its place. If non-agriculturists had entered the conference with the view that farmers want a stability that is artificially supported, they were soon disabused of this background opinion by the farmers, whose wish to be able to become independent of subsidies is sincere.

If agriculture's research workers and advisers have felt that farmers are slow to take advantage of modern cost-reducing methods of production, they learnt more thoroughly than before that the essential prerequisite for a farmer is to feel certain that the national 'plan' for agriculture will not be subject to abrupt changes of emphasis or direction.

A new outlook towards agriculture—and within it—may well have emerged from these three days of discussion, discussion that continued privately during all the breaks and discussion that had to be rationed to three-minute contributions in most of the sessions. If this view—that at long last the turning-point of reality for agriculture has been reached—proves correct, then the credit belongs to the chemical industry, to this inspired act of leadership by ICI.

## Swedish Petrochemicals

BECAUSE of the ever-growing demand for petroleum chemicals, there has been a considerable increase in the domestic Swedish output of such products. According to the Stockholm newspaper *Svenska Dagbladet* it is estimated that the production of solvents, plastics, synthetic rubber, artificial fertilisers etc., will total 200,000 tons a year. It is stated that there is an ample supply of raw materials, due to the great expansion of the capacity of the Swedish oil refineries which has taken place in recent years—from 400,000 tons in 1952 to 7,500,000 tons in 1955. (Note—The output may well be affected this year by the Suez situation.)

## Duomeen T on Show

AT the Public Works Exhibition at Olympia, 12 to 17 November, the Chemical Division of Armour & Co. Ltd., Smithfield, London EC1, exhibited the heavy duty anti-stripping agent, Duomeen T. This is a diamine widely used as an additive to both tar and bitumen to prevent stripping due to wet weather or difficult stones for surface dressing, macadam and similar work. It was introduced only three years ago in Great Britain and since then its use has grown quickly. The usefulness of Duomeen T was illustrated by means of a diorama, photographs etc.

## New Succinamide Process

DEVELOPMENT of a new process for producing succinamide has been announced by the American Cyanamid Co., US, which trades in Great Britain as Cyanamid Products Ltd. It is understood that the process will allow more succinamide to be available for commercial use. Succinamide is used in processing starch or cellulose. It can also be used in the preparation of a number of other chemical reagents of industrial importance such as brominating agents.

## African Aluminium Project

AN INVESTMENT of \$100 million is planned by Aluminium Ltd. of Canada in a wholly owned French subsidiary for the creation of a new bauxite and alumina industry in French West Africa.

The plans envisage the creation of a new bauxite industrial area in French West Africa about 345 miles south east of Dakar. A chemical works will be built with a capacity of 250,000 short tons of alumina.

## DIDO Reactor Opened

### Fundamental Nuclear Science Research Tool

DIDO, the most powerful reactor of its kind in Western Europe, was opened by Sir Cyril Hinshelwood, President of the Royal Society, at Harwell on Wednesday 21 November.

A heavy water-cooled and moderated reactor, which is fuelled by highly enriched uranium, DIDO was built to provide the intense neutron fluxes which are now needed both to help advance the UK Atomic Energy Authority's reactor research programme and to serve as a fundamental research tool in the nuclear sciences. It will be used to do a wide variety of experiments ranging from fundamental physics to basic technology.

Sir John Cockcroft, director of the Atomic Energy Research Establishment, speaking at the opening ceremony, said that DIDO will 'provide for research purposes a neutron intensity, 40 times that hitherto available to us. This will reduce the time required to carry out tests on components of the nuclear power stations of the future from years to weeks, and this is of enormous importance to a development programme.'

## GLAXO'S YEAR REVIEWED

### Sir Harry Jephcott Describes Further Investments

IN HIS review of the year ended 30 June 1956 Sir Harry Jephcott, chairman, Glaxo Laboratories Ltd., states that the provision of facilities for the continued expansion of the company's business, both at home and overseas, has necessitated further investment in fixed assets of some £800,000 during the year at home and £500,000 overseas, all of which has been found from the undistributed profits of previous years. As a result, the issued capital is again unrepresentative of the capital invested, and it is proposed to capitalise £1,592,700 of the capital reserves and to issue to stockholders one additional 10s share for every two 10s units of ordinary stock held. The consent of the Capital Issues Committee to this proposal has been received.

At the same time, continues the chairman, opportunity is being taken to eliminate the formal structure of 1s ordinary shares transferable in 10s units, and to make the ordinary share unit one of 10s converted stock.

The chairman's statement continues: 'We have agreed with the directors of our subsidiary company in the Argentine that royalties of earlier years, which could not be remitted and which were fully employed in the business, should be capitalised and that, in addition, we would provide a further

## Rum Jungle Acid Plant

AT RUM JUNGLE, in the Northern Territory of Australia, construction has begun of the largest acid plant on the various mining fields in the country. The plant will produce sulphuric acid from imported sulphur and will more than treble the present acid-making capacity at Rum Jungle. The sulphuric acid is required in the refining of uranium ore produced in the area.

Simon-Carves (Aust.) Pty. Ltd. are the constructors. Machinery for the plant was shipped from Great Britain.

## Fall in Profit

A. BOAKE, ROBERTS & Co. (Holdings) reports a fall in profit for the six months to 30 September to £59,000 (before tax) against £254,000 for the same period in 1955. This result is said to be due primarily to increases in costs which the company has not been able to recover by raising selling prices.

It is considered, however, that because of expansion plans the company's long-term prospects are good. The interim dividend is unchanged at four per cent.

investment in our Argentine Company in order that our manufacturing facilities might be expanded. . . .

'Further developments are also in contemplation or in hand at our subsidiary companies in India, Pakistan, New Zealand, Italy and elsewhere. In some instances we may need to provide additional capital both for fixed assets and to finance increasing business.'

Sir Harry Jephcott adds that the company's recently acquired subsidiary, The Murphy Chemical Co. Ltd., had a satisfactory year, during which progress was made both in turnover and in profitability.

Net profit of the group for the year, after providing for taxation, was £1,765,428 compared with £1,556,501 for the previous year. The company's proportion of this is £1,584,393 (£1,476,079). After adding the amount brought forward from last year there is a disposable balance of £2,023,165 (£1,896,209).

An interim dividend of 6½ per cent less income tax was paid on the ordinary stock on 14 June 1956, and the directors now recommend the payment of a final dividend of 7½ per cent less income tax, making 14 per cent for the year. This compares with 12½ per cent for the previous year.



# NOTE & COMMENT

## UK-AUSTRALIA TRADE PACT

A NEW trade agreement between Britain and Australia to replace that of 1932 has been signed in London. It will operate for five years initially, but both Governments will review its operation and future application before the end of that period. Mr. Peter Thorneycroft, President of the Board of Trade, has said that the Australian authorities placed particular emphasis on the desirability of increased sales in traditional Australian exports here.

The UK has agreed to maintain tariff preferences on a wide range of agricultural products. The Australian Government will continue to give tariff preferences for all those UK goods at present receiving them, subject to the right to reduce the preference levels to new guaranteed minimum margins of seven and a half per cent for capital goods and 10 per cent on most other goods. The range of goods covered remains unchanged at 90 per cent of total trade between the UK and Australia.

Australian goods on which the UK will maintain the existing guaranteed margins of preference include zinc, lead and asbestos (Annex A). In respect of goods listed in Annex D, there is a margin of preference of seven and a half per cent. The list of goods in Annex D includes: (1) All by-law items of the Australian Customs Tariff; (2) Aluminium and nickel; measuring and controlling instruments; air and gas compressors and exhausters; electrical control equipment, electrical regulating, starting and controlling apparatus; dyestuffs; Portland cement; animal washes; weed and scrub killers; insecticides and disinfectants; ammonium sulphate; and drugs and chemicals not elsewhere included in the tariff. Annexes B and C are not of interest to the chemical and allied industries.

## SILICON OF HIGH PURITY

SILICON, even of the highest commercially-available purity, contains significant amounts of impurities which must be removed before the silicon can be used for semiconductor devices. Boron is considered the most difficult impurity to remove. However, H. C. Theurer, Bill Telephone Laboratories, US (*J. Franklin Inst.* 1956, **262**, 298) reports that boron can be removed from molten silicon by reaction with water vapour. Boron is oxidised and the oxidation products evaporate.

The method employed is as follows: A liquid silicon zone, supported only by surface tension, traverses a vertical silicon rod around which flows a mixture of hydrogen and water vapour. Contamination from crucibles is avoided and a large interface between the silicon and the atmosphere is provided. Boron removal

increases with time and water-vapour concentration. Silicon is obtained which contains only one part in ten million of boron. It has a resistivity greater than 3,000 ohm/cm.

Another method of obtaining very pure silicon has been reported by Bernard Rubin and co-workers, Air Force Cambridge Research Centre, US. (*Chem. & Eng. News*, 1956, **34**, No. 42, 5007). A physicochemical approach has been developed which involves synthesis of a suitable compound of silicon, purification by crystallisation, sublimation and zone refining. Decomposition into elemental silicon follows.

Because it is relatively easily synthesised, is capable of purification to the extent required of the final silicon and decomposes easily without contamination, silicon tetraiodide was the compound chosen. Iodine vapour is passed at 110°C over silicon at 810°C to produce silicon tetraiodide. Formation of this compound reduces the total impurities from 2,794 p.p.m. to 1,675 p.p.m. About 50 per cent of silicon charge is used; conversion to SiI<sub>4</sub> is about 95 per cent based on I<sub>2</sub>.

The compound is crystallised from dried fractionally distilled toluene and contains 315.5 p.p.m. impurities. Sublimation at 100°C still further reduces impurities to 51 p.p.m. After 30 passes, a silicon tetraiodide matrix is obtained with impurities of five p.p.m. Decomposition of the purified SiI<sub>4</sub> at 1,000°C *in vacuo* gives silicon of a very high purity.

## EASIER RADIO-LABELLING ?

AMONG THE topics discussed at the recent national meeting of the ACS, a new and simple method of giving organic compounds radio-active 'labelling' for research was reported by K. E. Wilzbach of the Argonne National Laboratory. This involves no more than exposing the compound to tritium gas. The labelling is at random—it is not placed at any particular point in the molecular structure, and for this the method of preparation by synthesis must continue to be used. Nevertheless, there must be many investigations where only the movements or distribution of the whole compound need to be studied. Indeed, in some types of biological research, a substance that is still unknown in any precise chemical sense could be usefully labelled by exposure to tritium.

It was said that tritium is now so readily, and relatively cheaply, available that its use may soon surpass that of any other radioactive isotope. Its US price was quoted at two dollars per Curie. It has a short half-life and low health hazards in handling. It was reported that this simple method of labelling had been so far successfully applied to heptane, sucrose, benzoic acid, toluene, cholesterol and digitoxin.

# People in the NEWS

● The appointment of Mr. Francis de Buda to the board of Amber Pharmaceuticals Ltd. has been announced. He will be concerned with the development and marketing of the products of Amber Industrial Chemical Treatments (a division of the company). Until 1955 Mr. de Buda was sales manager and vice-president in charge of sales of Wayne Inc., US, in the field of chemical specialities and technical products. Before this he was sales engineer and export manager of the Bristol Co., Waterbury, Conn., US.

● In view of continued ill health, Mr. T. ANNESS, commercial manager, Laport Chemicals Ltd., has agreed to accept a less onerous position, and consequently he will be appointed managing director of A. W. Brook Ltd., Leicester. The position of commercial manager will not be re-filled. Mr. R. S. LANCASTER has been appointed general sales manager, and Mr. R. H. CHAMPKIN, sales office manager. It has also been decided to form an export department, and Mr. F. D. HAND has been appointed export sales manager.

● As reported in last week's issue, MR. GEORGE BREARLEY, B.Sc., F.R.I.C., M.I.Chem.E., has been appointed director of the ABCM in succession to Mr. J. Davidson Pratt who is retiring in June next. Since April 1953 Mr. Brearley has been a partner of Cremer & Brearley, consulting chemical engineers. From 1926 to 1953 he was employed by Brotherton & Co. Ltd.,



Mr. G. Brearley,  
ABCM Director

and was a director of that company from 1938 and managing director from 1946 until his resignation in 1953. His ABCM activities have included membership of Group D and participation in chemical works safety conferences. He has been active in AC & AE affairs and was, in 1952, chairman of the member group. He has been a member of the councils of the Royal Institute of Chemistry and the Institution of Chemical Engineers, and is chairman of the annual reports and monographs sub-committee of the SCI. Mr. Brearley will take up his appointment with the ABCM on 1 April.

● MR. JAMES EWING, chairman of Bradford Dyers Association, has been elected a vice-president of the British Man-made Fibres Federation. He is also chairman of the newly-formed Dyers of Man-made Fibre Fabrics Federation, another constituent organisation of the British Man-made Fibres Federation, formed to co-ordinate the various dyeing trades groups.

● DR. EDWARD W. COMINGS, head of the School of Chemical and Metallurgical Engineering, Purdue University, Lafayette, Ind., is to be given the William H. Walker Award for 1955 by the American Institute of Chemical Engineers. He is the 21st winner of the award which was instituted in 1936 to encourage excellence in contributions to chemical engineering literature.

● Awards of medals have been made by the Royal Society to PROFESSOR P. M. S. BLACKETT, Professor of Physics, Imperial College of Science and Technology, London (Copley Medal); DR. F. P. BOWDEN, Reader in Physical Chemistry, University of Cambridge (Rumford Medal); DR. J. S. HUXLEY (Darwin Medal); VISCOUNT CHERWELL, lately Professor of Experimental Philosophy, University of Oxford (Hughes Medal).

● MR. H. W. SYDENHAM, MR. A. J. DEITSCH, MR. C. GILBERT and MR. H. R. WHITE have resigned from the board of Ascotts Pharmacies. The resignations follow the scheme whereby the Hallamshire Industrial Finance Trust has agreed to purchase certain of the ordinary shares of Ascotts.

● MR. R. J. RONAN has been appointed regional manager of the technical services of The Texas Co. Mr. Ronan, who until his promotion was supervisor (field services) of the technical services division, will have his headquarters in Beacon, NY, the home of the Texaco research centre.

## Indirect Heating System

THE NEW phthalic anhydride plant now being built by Monsanto Chemicals Ltd. at its Newport, Mon., works will incorporate an indirect heating system made by Hygrotherm Engineering Ltd.

Hygrotherm systems use organosilicate liquids, in Monsanto's case TAS 180, as heat transfer media. This liquid has an operating range of 50°F to 650°F and effects liquid phase heat transfer without pressure. TAS 180 can be used both for process heating and cooling.

In the system to be adopted by Monsanto a ring main will supply 'liquid heat' to one batch still, three jacketed vessels and one heater coil. Each of these will be placed in a separate loop circuit and can be operated quite independently.

## Benzene Refining

SCHOLVEN-CHEMIE AG has licensed Koppers of Pittsburgh to operate its catalytic pressure refining process for benzene. Units are being built at Clairton, Pa. A recent trend in the US has been for coke oven benzene to compete with benzene of petroleum origin as a raw material for adipic acid for nylon manufacture. Hitherto only petroleum benzene has been suitable for this purpose because the sulphur content of coke oven benzene has been too high. The Scholven and the Lurgi refining processes produce a material having a sulphur content low enough to permit its use for adipic acid synthesis.

## Quickfit in Paris

A 100-TUBE fully automatic counter current liquid/liquid extraction machine, a counterpart of the largest laboratory glassware unit made by Quickfit & Quartz Ltd. is the centrepiece of the company's display at the 4th Salon de la Chimie Caoutchouc Matières Plastiques at Paris.

Also on show will be a circulatory cyclone evaporator which is being used by a Slough firm in the preparation of chemicals worth thousands of pounds. The display will be on the stand of Quickfit's French distributors, Société Canal.

## French Plastics Output

OUTPUT of synthetic resins in France in 1955 totalled 96,155 tons, nearly 30 per cent more than in the previous year. Combined capacity of the French plastics industry has been estimated to exceed 146,000 tons.

## Organic Red Pigment

### Outstanding Fastness to Light & Heat Claimed

IRGALITE RED HGL, a new organic red pigment which has been specially developed for use in plastics, particularly p.v.c., is announced by The Geigy Co. Ltd. It is claimed to have outstanding fastness to light and heat, even at tint concentrations.

To obtain the best fastness properties in pigmented plastics it has often been necessary in the past to use inorganic red pigments. Apart from their high cost and low tinctorial strength, these have the disadvantage of considerable loss of brilliance when used at low concentrations for tint transparencies or reduced with white pigment for pale opaque pink shades.

Irgalite Red HGL is a result of several years of research and development work. Like other colouring materials its shade and properties are affected in some degree by the use of different polymers, plasticisers, stabiliser systems etc., but such variations are said to be slight.

The company points out that the chemical constitution of the new pigment makes it unsuitable for use in rubber compounds.

## Fire Protection

NOW READY for distribution is *Fire Protection Year Book 1957*, published by Benn Brothers Ltd. (proprietors of THE CHEMICAL AGE). The book is free to subscribers of *Fire Protection Review*; single copies cost 15s.

As previously, this edition includes directories of all public fire brigades and salvage corps in Britain, and industrial and private fire brigades, and details of fire services in the Commonwealth and Empire.

Chapters on civil defence, fire safety, fire engineering are also included.

The Year Book includes a diary and registers suppliers of fire safety equipment.

## Correction

ON page 286 of last week's issue there was a reference to the manipulation of low pressure polythene. The work originally appeared in *Chemische Industrie* and not *Chemie-Industrie Technik* (October) as stated.

## Research Laboratory

ON FRIDAY 16 November Unilever NV opened a big research laboratory for oil, fats and margarine at Vlaardingen, near Rotterdam, Holland.

## Murgatroyd's Extension

ON 21 November a party of trade, technical and national journalists were being shown round the Elsworthy (Cheshire) works of Murgatroyd's Salt & Chemical Co. Ltd. Considerable extensions to the plant have now been completed. These are associated particularly with the provision of increased amounts of chlorine and caustic soda.

Murgatroyd's Salt & Chemicals is now under the joint control of Distillers and Fisons. The chlorine will match DCL expansion in polyvinyl chloride manufacture while caustic soda output will be taken up by Fisons' industrial and pharmaceutical interests.

## New Chemical Available

SMALL QUANTITIES of a new chemical, N-methylolacrylamide, are being made available for research purposes by the American Cyanamide Co. Applications of this material include: an additive for sizing materials and dyes, and a component in the manufacture of cements, adhesives and thermosetting plastics. It is water soluble.

It can either be converted into a modified form of resin having less water solubility than itself, which is suitable for sizing or as a dye additive, or it can be linked to plastic polymer materials by a condensation process.

## Plastics Spring Covering

CRANE PACKING LTD. of Slough, which claims to be one of the first companies in the United Kingdom to process and fabricate the plastics polymer polytetrafluoroethylene, has now succeeded in developing a process whereby springs can be covered with p.t.f.e., or Fluon as it is generally known in this country. The coating is said to render a metal spring impervious to attack by corrosive substances, with the sole exception of fluorine and the molten alkali metals.

## BFMIRA Booklet

IMPROVEMENTS required in the design of food factory machinery, leading to easier cleaning and maintenance, and advice to manufacturers on how to make the best use of present equipment, are the subjects of two booklets issued by the British Food Manufacturing Industries Research Association.

The booklets are entitled *The Design of Machinery and Plant in Relation to the Control of Insect Pests*, and *The Installation of Machinery etc., in relation to the Control of Insect Pests*. Price is 5s.

## Gas Sales

### Industrial Users Take More Domestic Sales Down

INDUSTRIAL gas sales in the first quarter, April to June, of the financial year 1956-57 were three per cent more than in the corresponding period of 1955-56, according to statistics issued by the Gas Council. Domestic sales, however, were down by more than two per cent and commercial and other sales decreased by almost one per cent. Total sales were thus slightly lower.

To release more coke for sale, there was an increase in the production of coal gas and a reduction of 26 per cent in the production of water gas, compared with the April-June quarter of 1955. Purchases of gas from coke ovens and oil refineries increased by almost 16 per cent, the total gas made and purchased being not quite one per cent under the total for April-June 1955. There was little change in the amount of coal carbonised, but oil for water gas production was reduced by 29 per cent.

Crude tar production rose by almost one per cent and crude benzole produced was up by over 12 per cent.

## Perfume Factory Fire

A QUANTITY of sodium exploded after coming into contact with water from a burst pipe at the Chester works of the Arthol Manufacturing Co. Ltd., perfume manufacturers, on Wednesday 14 November.

The explosion set fire to acetone in a nearby process plant. Workmen put out the flames using hand extinguishers. Sodium still remaining in the danger area was covered with sand and brushed away by the local fire service.

Damage was not extensive.

## Research Grant for Hull

THE research section of the Shell Petroleum Co. has made a grant of £1,000 to Hull University to finance a research appointment in the chemistry department over a period of two years from the session 1957-58.

## £2m Rubber Factory

A FACTORY is to be erected by the British Tyre & Rubber Co. Ltd. on a 32-acre site at Farington, Lancashire. It is expected to be operating early in 1958 and will comprise development and test laboratories with experimental and engineering shops, general offices, canteen and welfare facilities. The cost of the first stage of this new factory development will be approximately £2 million.

## BOE School Opened

### Need to Improve Skilled Manpower

'EDUCATION and training—these two words are the essence of progress' said Mr. Robert Carr, Parliamentary Secretary to the Ministry of Labour, opening the apprentice training school of British Oxygen Engineering Ltd. on 15 November. He went on to say that Britain grew rich by leading the world in technical knowledge and production techniques and we could only maintain our wealth, let alone grow richer, if we continued in the vanguard of industrial progress.

One of the first needs of this country was to improve both the quality and quantity of our skilled manpower, he said.

After the opening ceremony, Mr. J. S. Hutchison, chairman of the British Oxygen Co. Ltd., presented prizes to students and apprentices at the school.

## No Payment to be Made

ACCORDING to reports received at the Board of Trade, the local press in Jeddah, Saudi Arabia, has announced that from 13 November no payment for cash against documents may be made if the documents bear a later date than 13 November.

Letters of credit opened before 13 November will be unaffected but subsequent letters of credit may be opened only with the permission of the Saudi Arabian Ministry of Finance. Essential foodstuffs and medicines are exempted from these restrictions.

The Saudi Arabian Embassy in London is now closed and the Board of Trade does not yet know what arrangements have been made for the legalising of invoices for goods to be exported to Saudi Arabia.

## Thorin & Dithizone

MONOGRAPHS on Thorin and Dithizone, numbers 29 and 30 respectively in Hopkin and Williams' series of 'Organic Reagents for Metals,' have now been published. Thorin (1-(0-arsenophenylazo)-2-naphthol-3:6-disulphonic acid) is a reagent for thorium and also for lithium, fluoride and zirconium. Dithizone (diphenyl thiocarbazono) is a reagent for lead.

## Dutch-US Plastics Plant

THE DUTCH firm of Scado, at Zwolle, has entered into close co-operation with Archer-Daniels-Midland, seed and oil millers of Minneapolis. The two companies plan to operate a joint factory in Holland for the manufacture of synthetic resins.

# OIL & CHEMICAL PRODUCTS

## Effects of Suez on Petrochemical Industry

A SIGNIFICANT SECTION of chemical industry is today dependent on oil refineries for its aromatic and aliphatic raw materials. A special correspondent writes that production of petrochemicals has been increasing rapidly in the US, the UK and Europe.

In 1954 total carbon content of petrochemicals in OEEC countries rose to 300,000 metric tons from 200,000 the year before. In 1955 this total reached 400,000 and for 1956 was expected to exceed 450,000 metric tons. Predictions for 1959 carbon content of petrochemicals produced in Western Europe are around one million metric tons.

### High on Priority List

How seriously then is the European petrochemical industry likely to be affected by the Suez Canal situation and difficulties in obtaining Middle East oil? Because of the economic value of the end products it is certain that the petrochemical industry is high on the priority list.

Fortunately, petrochemicals do not have large tonnage requirements. In the US, for instance, only 0.8 per cent of crude oil ends up as petrochemicals. In Western Europe in 1955, the feed stock consumed in petrochemicals was 580,000 metric tons of gas and 774,000 metric tons of oil. (It is estimated that some 40 per cent of all petrochemicals come from crude oil sources and the other 60 per cent from natural gas).

### Oil via the Cape

It is considered, therefore, that adequate supplies of feed stock for the petrochemical industry could be supplied even during a lengthy period of crisis by oil brought via the Cape and from the Western Hemisphere. Should supplies of Middle East oil cease altogether, however, the outlook for the industry would be very poor.

Demand for the unsaturated hydrocarbons such as ethylene, propylene and butylene increased rapidly because these materials have been needed to satisfy plastics, detergents, synthetic rubber and aviation fuel requirements. The light saturated hydrocarbons (ethene, propane, and butane) from fuel and liquid producer gas outlets have also been going into feed stocks for the production of unsaturated hydrocarbons. The growth of butadiene as a chemical raw material forecasts great increase in butane consumption.

Until the present oil crisis, the development of very high octane fuels was being watched with interest;

the development could affect the availability of those hydrocarbons important to chemical and plastics manufacturers. Thus, propylenes and butylenes were being used to upgrade motor fuels.

The trend in oil refining latterly has been to produce greater quantities also of light aliphates (methane, ethane, ethylene, propane) and smaller amounts of heavy fuel oil.

Refineries have been removing normal paraffin compounds (n-heptane, n-hexane and n-octane) from motor fuels. n-heptane has a zero octane rating and when 10 per cent is removed from the fuel, the octane number moves up 10 points. Removal of other normal paraffins also increases the octane number. The paraffins mentioned are obtained from the extraction process as relatively pure products and could be useful raw materials for chemical production. It is understood that these paraffins are normally fed back to cracking and reforming operations.

### Reduce Cat-Cracking

It has been tentatively suggested that in the present emergency, refineries would cut down on cat-cracking, thus producing an overall increase in refinery throughput of fuel oil and gas and diesel oil, but with consequent reduction in the output of saturated and unsaturated hydrocarbons.

However, from available information it seems that such a procedure is unlikely since it will be to the nation's economic advantage to retain cat-cracking with its valuable end-products. Therefore, for the time being petrochemical output should not be markedly affected, if at all.

Unfortunately, rising prices of oil may well cause price increases in petrochemicals.

## Nylon Hose Coupling

A NEW hose coupling made by Bowden (Engineers) Ltd. will be shown in England for the first time at the Smithfield Show, Earls Court, 3 to 7 December. Named the Bowdenfix coupling, it is made of nylon and is said to be in use already in some European steel mills and coal mines.

The coupling is available for hoses up to one inch internal diameter, and will withstand gas or liquid pressures of up to 200 lb. per sq. in.

In addition to the Bowdenfix coupling, Bowden will be showing a range of its other products at the Smithfield show.



# CHEMICAL INDUSTRY OUTLINES

## Plant Design, Engineering & Commissioning by HWP

**H**EAD WRIGHTSON PROCESSES LTD. is a member of the Head Wrightson group. The parent member, Head Wrightson & Co. Ltd., of Thornaby-on-Tees, was registered as a public company in 1890, but was founded many years before that date. Its principal interest is in general heavy engineering and in this work it employs several thousand men. In addition to the Thornaby works there are extensive works in South Africa.

### Complete Programme

The HWP organisation operates as consulting engineers and general contractors for plant and equipment in the chemical, petroleum and allied process industries, the services available ranging from the inception of the project to the commissioning and handing over of the complete operating plant.

Within the company are experts capable of handling every phase of such a programme, including process design, engineering, purchasing, progressing, inspection, shipping, erection and commissioning. Arrangements can be made with their associated companies, when this is in a client's best interest, to undertake research and pilot-plant development work on new processes.

HWP claims to provide all the services which the client would require in developing and building a new plant, and to do this in the most economical fashion. Experience has dictated that it is frequently not an advantageous arrangement for a company, whose principal interest is producing chemicals or allied materials, to set up a subsidiary department of sufficient size and skill to handle adequately large expansion programmes.

For handling these complete programmes HWP has on its staff a team of specialist chemical and mechanical engineers whose combined experience covers every aspect of work likely to be encountered.

### Trained Draughtsmen

A substantial cadre of trained draughtsmen is sufficiently flexible to cater for peaks of work. Operating in parallel with the technical and draughting departments are a corresponding number of purchasing, inspection and progressing engineers. For the erection and commissioning of plants there is a group of experienced supervisors available to travel anywhere at short notice.

On receipt of a plant contract it is the company's practice to appoint a

senior engineer as a project manager. It is this engineer's duty to carry over all responsibility for the programme at all its stages, to co-ordinate the work of the various departments and groups involved, and above all to be answerable personally for the harmonious liaison with clients.

In contracting work orders are placed for equipment wherever it is considered that the client will be best served, yet on occasion the manufacturing facilities of the Head Wrightson organisation can be of help in the rapid completion of the contract. At Thornaby, for example, there is a completely equipped shop given over entirely to the construction of tubular heat exchangers and specialist heat-transfer equipment. Another shop is equipped in the most modern fashion for the production of Class 1 welded pressure vessels. Radiographic equipment is available for the examination of welds.

### Specialist Experience

There is also available in the group specialist experience in equipment of almost every type likely to be encountered in process plant. This knowledge ranges from heat exchangers, furnaces, cooling towers and oil gas separators to vibrating screens, rotary dryers, gas cleaning plant and crushing plant.

There is a special products department in the company which was formed

to make a close study of the various methods of cooling in industry today and to handle the design of specialist equipment. The company designs and manufactures air-cooled heat exchangers in addition to water cooling towers and tubular heat exchangers and is in a position to give unbiased advice concerning the application of any form of cooling to a particular situation. Both HWP and its associates in this field in the US, The Fluor Corporation Ltd., believe in a programme of continuous research and development into modern cooling practice.

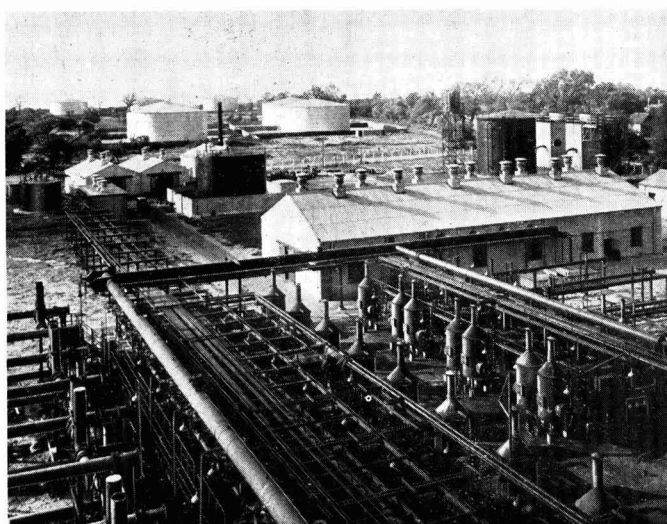
### Range of Interests

Thus the whole range of interests can be covered in an expert fashion by the interchange of information within the fabric of the HWP organisation.

HWP has designed and engineered plant in many refineries in the UK and abroad, including Llandarcy, Stanlow, Grangemouth, Waste, Curacao, Antwerp, Pernis and Bombay, and has also engineered and erected the new grease plant at Birkenhead. At the present time orders are being handled for four nuclear research reactors, two at Harwell and one at Dounreay. The fourth research reactor and the first to be exported from the UK was ordered from Head Wrightson Processes for erection in Australia.

The company has undertaken a number of projects for the United Kingdom Atomic Energy Authority, and a special division has been formed to deal with work for the atomic industry.

*Carbon black plant at Avonmouth for Philblack Ltd. This shows the reactor area where the raw material is converted into quality Philblacks*





# From all Quarters



## Enriched Uranium

PRODUCTION of enriched uranium by a US private company, namely Mallinckrodt Chemical Works, has recently been announced. The process involves conversion of uranium hexafluoride (obtained from the Atomic Energy Commission at Oak Ridge, Tenn.) into two grades of uranium dioxide enriched in the isotope  $^{235}\text{U}$ .

First shipments have been made to companies using the enriched fuel in programmes associated with atomic power. It is expected that the demand for enriched uranium will increase as the US commercial atomic power industry gets started.

## Beryllium Production

ACCORDING to the Bureau of Mines, US Department of the Interior, world production of beryl, the source of beryllium and its products, reached the record high figure of 8,700 short tons in 1955. In 1954, some 7,200 short tons were produced. Southern Rhodesia produced 965 short tons, compared with 500 short tons from the US.

The only two plants in the US that process beryl to beryllium metal products are the Beryllium Corporation of Reading, Pa., and the Brush Beryllium Co. of Elsinore, Ohio. Production of beryllium-copper, beryllium-aluminium, beryllium-nickel, and beryllium oxide has increased from that in 1954.

## Chilean Nitrate Price

FIRST CHANGE in the price of Chilean nitrate of soda since 1950 has recently been announced by the Chilean Nitrate and Iodine Sales Corp. The price has been reduced by US \$1.75 per ton.

## Fertilisers in Denmark

USE of artificial fertilisers has increased in the farming year 1955-56 compared with the previous year. Consumption of phosphate fertilisers totalled 550,000 tons (501,000 tons in 1954), that of potash fertilisers totalled

314,000 tons (290,000 tons in 1954) and that of nitrogen fertilisers totalled 575,000 tons (489,000 tons in 1954). The totals for phosphate and potash fertilisers include the deliveries of the mixed potash and superphosphate fertiliser produced for the last four years by the Danish Fertiliser Co. (Det Danske Godningskompagni) which has proved so popular with Danish farmers.

## New Type of Cement

IT IS REPORTED that a research scientist of the Japanese Ministry of Construction has evolved a new type of cement, which is said to be very cheap, highly waterproof once it has set, and proof against temperatures up to 400°C. The cement is produced from limestone and blast-furnace slag, pulverised separately and mixed equally or in the ratio of 40 to 60. The cement is reported to be slower in hardening than Portland cement. As it corrodes iron faster than ordinary cement, however, it is not considered suitable for ferro-concrete work.

## Rubber Auxiliary

A NEW rubber auxiliary, zinc heptate, is expected to be put on the market soon by a French firm. Incorporation of three per cent of the product in raw rubber is claimed to reduce mastication time by half. Additions of the order of five per cent in rubber stock are said to replace stearic acid, zinc oxide, and plasticizers, to improve extensibility without reducing tensile at break, and to improve ozone and abrasion resistance.

## Dead Sea Potash

THE new bromine plant, now ending its experimental production run, is estimated to produce 1,250 tons per annum when full output is reached, it is hoped, early in 1957. A new building for the production of ethylene dibromide is being erected at the factory.

A small factory for the production of hydrogen peroxide with a planned annual output of 150 tons has begun production at Holen, near Tel Aviv.

## Boron Trichloride

NIAGARA FALLS FACILITIES of the Stauffer Chemical Co. for the manufacture of boron trichloride are to be increased ten-fold. It is understood that by next February, when the company's new unit will be completed, the chemical will be manufactured in substantial tonnage and shipped in tank car quantities.

According to the company a new economical and improved process resulting from several years' research will be used. Until recently boron trichloride, essentially a base for the manufacture of high energy fuels and missile propellants, has been available only in relatively limited quantities.

## Czech Atomic Power

WORK on the first experimental atomic power station in Czechoslovakia is due to start in 1957. It is to be built with assistance from the USSR and is expected to commence operation in 1960. The fuel will be enriched uranium and the moderator will be heavy water. A plant for the manufacture of heavy water is also to be built but the process to be used has not been announced.

## Chromium Chemical

IN THE US, Allied Chemical (New York 6, NY, US) has begun pilot plant production of a high purity chromium chemical, chromyl chloride. It is described as a cherry red coloured volatile liquid which is a strong chlorinating and oxidising agent. It is highly soluble in solvents such as carbon tetrachloride and it reacts so vigorously with some substances that it bursts into flames.

Chromyl chloride is expected to be of value as a starting material for the manufacture of chromium organic compounds, some of which have proved useful as surface coatings and bonding materials.

## Israeli Chemicals

SOME 65,000 tons of phosphates are claimed to have been mined since April this year. A production level of 150,000 tons is aimed at for the current fiscal year.

## EXPORT OF ORGANIC CHEMICALS

### ICI Course for Overseas Representatives



AS PART of ICI's Billingham export drive, an intensive one-week course was recently organised for representatives of ICI companies and agents in Western Europe, together with a representative from Canada. The course had two main objectives—first, to give a technical survey of the products and the industries in which they are used, and second, for those present to discuss commercial policy with the management at Billingham.

In the photograph are overseas representatives who attended the course.

Left to right, K. Ludwig, Germany; J. H. Morris, Billingham; L. Bonizzoni, Italy; J. Pallas, Spain; R. R. Grierson, Billingham; S. Carlsson, Sweden; F. Alsing, Norway; A. J. Prince, Billingham; K. Kayser, Denmark; M. Desfloquet, ICI (France); L. M. Alfthan, Finland; D. L. G. Le Grand, ICI (Belgium); O. Gillis, ICI (Belgium); de Winter, ICI (Holland); A. C. Finch, Billingham; F. J. Smith, London; H. Appleton, Billingham; S. W. Saunders, Billingham; R. S. Sansome, Canada.

## GIBBERELIC ACID-LIKE SUBSTANCE

IN A RECENT REPORT (*Nature*, Vol. 178, No. 4541, 1956, 1070) M. Radley states that evidence has been obtained of a substance with similar physiological properties to gibberellic acid in the shoots of dwarf and tall peas. Details are given of the extraction of the growth-regulator. The residue obtained was spotted on chromatography paper and the chromatograms were tested for gibberellic acid-like activity by an assay based on growth of sections of the first leaf of etiolated wheat seedlings. The wheat leaf test has been found to be exceedingly sensitive to gibberellic acid; leaf sections in this investigation, placed on treated moistened paper, increased in length by about 5 mm.

### Length Increase

In  $3 \times 10^{-6}$  M gibberellic acid length increase is of the order of 7 mm, and even concentrations of  $10^{-8}$  M are stated to cause an appreciable growth increase over controls. The test is regarded as being to some extent specific for gibberellic acid and related compounds, for although growth is slightly enhanced by indolyl acetic acid, considerably higher concentrations are required.

Approximate  $R_F$  values for gib-

berellic acid and several auxins, using the solvent system were: gibberellic acid, 0.46; indolyl acetic acid, 0.83. Indolyl acetonitrile, methyl indolyl-acetate and indolyl butyric acid moved with the solvent front.

### Graphite Lubricant

TESTS with 'dag' Dispersion 2404 (colloidal graphite in white spirit) marketed by Acheson Colloids Ltd., 18 Pall Mall, London SW1, have shown that it produces on rubbing surfaces a graphitic film that resists oxidation, inhibits corrosion, eliminates sticking and reduces friction.

It has proved a very satisfactory lubricant for moving conveyor chains. The liquid carrier of this preparation is stated to provide good wetting action, and, although volatile, it is present long enough to enable the colloidal graphite particles to reach inaccessible parts of conveyor chains.

### New Factory Planned

MAGNESIUM ELEKTRON LTD., metal alloy manufacturers, are seeking permission to erect new factory premises on about 100 acres of land at Bone Mill Quarry, Hopton, Ashbourne, Derbyshire.

## Corrosion Science

### SCI to Award 25 Guinea Prize for Essay or Paper

A PRIZE of 25 guineas will be awarded by the Corrosion Group of the SCI for an essay or paper on any aspect of corrosion of metals and its prevention.

Essays are invited from persons not more than 27 years on the closing date (31 March next). A length about 4,000 words is suggested, but reasonable latitude will be allowed.

A successful candidate may subsequently be invited to deliver his or her contribution as a lecture.

Publication of any successful entry will rest with the SCI, but if the Society does not exercise its right, an entrant is free to publish his or her work in any journal.

Essays should preferably be typed (double spaced), on one side of the paper only with adequate margins. The candidate's name must not appear on the script. The entry must be enclosed in a sealed envelope bearing a pen-name. A letter bearing the pen-name and including a statement of the full name, address and date of birth of the author must accompany the entry. Illustrations (diagrams and/or photographs) may be included with the entry in the sealed envelope, but must not provide means of identifying the author.

Entries should be addressed to: Corrosion Group Essay Competition, c/o Society of Chemical Industry, 14 Belgrave Square, London SW1.

### Training Courses

IT IS announced by the Association of Chemical and Allied Employers that 423 chemical operators in the industry have now qualified through the shortened course adopted by the chemical and allied industries JIC and by the drug and fine chemical JC three years ago.

About 500 operators, mainly youths, are now undergoing training on the full course. The shortened course will be running for a further two years.

### Danish Pyrolytic Gasworks

NOW in operation is A. P. Mollen's pyrolytic gasworks in Amagar. It is understood that it will convert annually 150 to 175,000 tons of fuel oil into ethylene, gas, petrol and materials for the production of plastics and synthetic textiles. Gas production is expected to be about 44.6 million cubic metres a year as well as 15,000 tons of bottled gas.



**DIARY  
DATES**

**MONDAY 26 NOVEMBER****CS (Cambridge Section)**

Cambridge: University Chemical Laboratory, Lensfield Road, 8.30 p.m. 'Aromatic Detrimethylsilylation—Some New Electrophilic Aromatic Substitutions' by Dr. C. Eaborn.

**CS (Newcastle & Durham Section)**

Durham: Applebey Lecture Theatre, Science Laboratories, The University, 5.15 p.m. 'The Mechanics of Steric Hindrance' by Professor C. K. Ingold.

**SCI (Yorkshire Section)**

Bradford: Technical College, Gt. Horton Road, 7 p.m. Joint meeting with Bradford Chemical Society. 'Chemical Aspects of Wood Preservation' by B. Hickson.

**Institution of the Rubber Industry**

Manchester: Grand Hotel, 6.45 p.m. 'The Chemist's Contribution to Improved Rubber Processing' by K. R. Taylor and B. E. Wilde.

**TUESDAY 27 NOVEMBER****RIC (London Section)**

London: Sir John Cass College, Jewry Street EC3, 6.30 p.m. 'Magnetism and Inorganic Molecules' by Professor R. S. Nyholm.

**CS (Nottingham & Leicester)**

Nottingham: Lecture Theatre, Chemistry Department, The University, 4.45 p.m. 'Mechanism of Solid-state Reactions and the Structure of the Solid State' by Professor W. E. Garner.

**WEDNESDAY 28 NOVEMBER****RIC (London Section)**

London: South-West Essex Technical College, Forest Road, Walthamstow E17, 7 p.m. 'Gas-Liquid Chromatography' by A. T. James.

**I.Chem.E. (Graduates & Students)**

Dagenham: Metallurgical plant, Ford Motor Co. Half-day visit.

**SCI (Food Group)**

London: 14 Belgrave Square SW1, 6.45 p.m. 'New Aspects of the Evaluation of Biscuit Flour' by G. Clewlow and W. Dixon. 'The Stability of Vitamin C in a Commercial Fruit Squash' by A. E. Bender.

**SAC (Scottish Section)**  
Edinburgh: George Hotel, George Street, 7 p.m. 'Colour Chromatography' by J. P. Cunningham.

**SAC (Physical Methods Group)**  
London: Meeting Room of the Chemical Society, Burlington House, Piccadilly W1, 6.30 p.m. Annual general meeting; followed by 'Optical Rotations in the Study of Organic Structures' by Dr. W. Klyne.

**Institute of Fuel**

London: Institution of Civil Engineers, Great George Street SW1, 5.30 p.m. 'The Cost in Britain of Air Pollution from Different Types of Source' by R. S. Scorer.

**THURSDAY 29 NOVEMBER****CS (Bristol Section)**

Bristol: Chemistry Department, The University, 5.15 p.m. 'Science in the Detection of Crime' by Dr. J. B. Firth.

**CS (Hull Section)**

Hull: Organic Chemistry Lecture Theatre, The University, 7.30 p.m. 'The Steric Control of Chemical Reactivity' by Dr. G. Baddeley.

**SCI (Plastics & Polymer Group)**

London: Rooms of The Royal Society of Tropical Medicine & Hygiene, Manson House, 26 Portland Place W1, 6.30 p.m. 'Recent Progress in Heterogeneous Polymerisation of Olefines' by Professor H. F. Mark.

**FRIDAY 30 NOVEMBER****CS (Birmingham Section)**

Birmingham: Chemistry Department, The University, 4.30 p.m. 'Hydrocarbon Compounds of the Transition Metals' by Professor G. Wilkinson.

**CS (Cambridge Section)**

Cambridge: University Chemical Laboratory, Lensfield Road, 8.30 p.m. 'Sorption of Vapours in Crystals' by Professor R. M. Barrer.

**CS (Exeter Section)**

Exeter: Washington Singer Laboratories, Prince of Wales Road, 5 p.m. 'Non-benzenoid Aromatic Systems' by Professor Wilson Bawer.

**Plastics Institute (NW Section)**

Manchester: Engineers' Club, Albert Square, 6.45 p.m. 'Polyurethane Resins' by R. B. Waters and W. Abbotson.

**Oil & Colour Chemists Association**

London: Grand Hall, Criterion Restaurant, Piccadilly W1, 7 p.m. Ladies' Night.

**Uranium in Finnmark**

IT is reported that considerable deposits of uranium ores have been found in Finnmark, but it is not yet known whether they can be economically exploited.

**Tasmanian Plant**

A £4 MILLION plant which will produce 55,000 tons of ammonium sulphate a year began operating at Risdon, Tasmania, on 1 November. Only 20 men are employed at this fully automatic plant which covers more than two acres at the Electrolytic Zinc Co.'s works, at Risdon. The chairman, Mr. H. T. Hey, has said that the company plans to increase annual production from the current figure to 155,000 tons. The greater part of the initial output will go to Queensland and New South Wales.

Production at Risdon already represents half of Australia's ammonium sulphate requirements. It is intended that eventually the new plant will supply all of Australia's needs.

**Nylon Agreement**

AN AGREEMENT with the Spencer Chemical Co., Kansas City, US, has just been concluded by NV Onderzoekingsinstituut Research, the research institute of AKU (Algemene Kunstzijde Unie NV), Arnhem, under which the Dutch Company places at the disposal of the Spencer Chemical Co., its knowledge and experience of the manufacture and use of nylon 6 granules (Akulon granules). The latter company is also entitled to use NV Research's patents in this field in the US.

**Explosion Injures 5 Men**

A LEAK of inflammable gas caused an explosion at the Billingham works of Imperial Chemical Industries on Saturday 17 November. The explosion, in which five men were injured, occurred in an isopropanol plant and was due to a mechanical fault in an injector. At time of going to press the plant was still closed down and ICI said that the time for repairs was not known. There was no damage to the main plant.

The five injured men, who were taken to hospital, were reported to be progressing satisfactorily.

**Nearing Completion**

AT COVENTRY, Courtaulds Ltd. has another new research laboratory nearing completion. The company states that work at the laboratory will deal with acetate and synthetic fibres. In June last year Courtaulds opened a laboratory for research on viscose fibres.

by  
Peter Pain M.A.

# Restrictive Trade Practices

## ROLE OF THE MONOPOLIES COMMISSION

ORDER than the Restrictive Practices Court is the Monopolies Commission; it was created in 1948 and strengthened in 1953. As the name implies its function was to inquire into the operation of monopolies. A monopoly was treated as existing in conditions in which at least one-third of all the goods of a particular kind in the UK, or processed in the UK or exported from the UK were supplied, processed or exported by one person or company, or by one group of associated companies, or by two or more persons who so conducted their affairs as to prevent or restrict competition.

Although the Commission fulfilled a rather different function from the Restrictive Practices Court (being a court of inquiry rather than a court of law and inquiring only into matters referred to it by the Board of Trade) it is easy to see that the Commission might have overlapped the work of the Court in cases where a 'monopoly' had been established by the adoption of an agreement laying down restrictive practices between a number of persons. This danger has been overcome by removing from the purview of the Commission all agreements which are within the jurisdiction of the Court.

### Work of the Commission

Without an intimate knowledge of economic organisation it is difficult to say how far this will affect the work of the Commission. It seems fairly clear that it will still have an important function to fulfil, provided that the Board of Trade makes the initial references, as a number of monopolies exist, not least in the chemical industry, which are not supported by restrictive trading agreements. But the decision to refer is a political and not a judicial act. A government which did not favour the Commission could stifle it by the absence of references. The position of the Court is quite different; certain agreements must be registered and must be referred to it as a matter of law. That work will go on without any action being taken by the executive and there is nothing which the executive can do to stop the process.

It is probable that the work of the Commission will centre largely on monopolies in the hands of one company or group of companies. It may also have to deal with export monopolies, as restrictive agreements relating to exports are outside the scope of the Restrictive Practices Court. Where monopoly conditions exist because two or more firms do in fact observe the same restrictive practice without any agreement to do so ('conscious parallelism' as it is called in the US), this would appear to be a matter within

the jurisdiction of the Commission rather than the Court.

The Commission may now inquire into monopoly conditions governing the supply of goods of any description, the application of any process to such goods or the export of goods of any description, either generally or to any particular market. Monopoly conditions are not deemed to exist where one third or more of the trade is controlled by a restrictive agreement only.

### Types of Reference

Three types of reference may be made by the Board of Trade to the Commission:

(1) *Fact finding reference.* The Commission may be asked to inquire whether monopoly conditions exist, in what manner and to what extent they prevail and what things are done by the parties concerned as a result of, or for the purpose of preserving those conditions.

(2) *General reference.* The Commission is asked to make the same findings as on a fact finding reference and, in addition, to report whether the monopoly conditions, or all or any of the things done by the parties, operate, or may be expected to operate, against the public interest.

(3) *Specified practices reference.* In this case the Commission is asked to report whether monopoly conditions prevail, whether certain things specified in the reference are done by the parties as a result of, or for the purpose of preserving the monopoly conditions; and if so whether any of those things operate, or may be expected to operate, against the public interest.

In considering the public interest the Commission is bidden to take all relevant matters into account, but is enjoined specifically to have regard to the need, consistently with the general economic position of the UK, to achieve:

(a) Production, treatment and distribution by the most efficient and economical means of goods of such types and qualities, in such volume and at such prices as will best meet the requirements of home and overseas markets;

(b) Organisation of industry and trade in such a way that their efficiency is progressively increased and new enterprise is encouraged;

(c) The fullest use and best distribution of men, materials and industrial capacity in the UK;

(d) Development of technical improvements, expansion of existing markets and the opening up of new markets.



## Restrictive Trade Practices

If the Commission decides that any conditions or practices are contrary to the public interest, it must then consider what action should be taken to remedy the position and may include recommendations in its report. It must give the reasons for its conclusions. Minority reports may be given, except upon a fact finding reference.

Although the Commission is not a court of record, it is a quasi-judicial body and has laid down a procedure suitable to the nature of the inquiries which come before it. The Commission has power to take evidence on oath, and to compel attendance of witnesses and the production of relevant documents. It may also require returns, estimates or other information to be furnished.

### Action by Commission

Upon receiving a reference from the Board of Trade, the Commission advertises its readiness to receive the views of anyone interested in the matter and invites representatives of the companies concerned to a preliminary hearing. At this hearing the chairman introduces the members of the Commission's staff who are to be assigned to the inquiry, explains the procedure and a general discussion takes place as to the lines of the inquiry.

First phase of the inquiry is factual, to ascertain whether monopoly conditions exist. The Commission inquires into the companies' books to establish what has been done and to investigate costs and profits. All the facts, except the accountancy material, are considered at a 'clarification hearing.' The purpose of this hearing is to elucidate facts which are not clear to the Commission. The Commission will then determine whether monopoly conditions prevail.

If the decision is affirmative the Commission then sends a 'public interest letter' to the companies. This states that the Commission now has to consider the question of public interest, and contains schedules which are the real meat of the letter.

One lists the arrangements and practices which appear to restrict competition, or to exist for the sake of monopoly conditions. Another often takes the form of a questionnaire asking whether certain practices produce certain specified results. In addition there may be a summary of complaints made against the industry, with which the recipients can deal if they wish. The companies then send a 'reply to public interest letter' dealing with the points which have been raised. This letter is of great importance and requires the most careful wording. There is then a 'public interest hearing' at which the companies will normally be represented by solicitor and counsel. Following this the Commission prepares its report.

In dealing with accountancy questions the Commission usually seeks to discover from a representative sample of the trade the true costs of production or merchandising, the ratio of net profit to turnover and the ratio of net profit to capital employed. Before reporting, the provisional findings of the Commission are submitted to the companies concerned in order

that they may comment upon them. The all important item of fixed assets is frequently a bone of contention as the Commission values these by taking original cost price, less wear and tear allowance as allowed for income tax, but excluding initial allowance.

The Board of Trade must lay reports before Parliament, but need not do so where they are made upon a purely fact finding reference, or relate solely to exports. Parts may be excluded, the publication of which would be contrary to the public interest or would disclose secret processes, or relate to mineral deposits.

(to be continued)

## Tinplate Handbook

AVAILABLE free of charge to all interested in the manufacture, buying and use of tinplate, the *Tinplate Handbook* has been thoroughly revised and 12 pages of new matter have been added, making a total of 44. The book begins by describing tinplate and how it is made. Section II gives figures for tinplate production up to the end of 1955. Section III runs briefly through the steel-making and rolling processes and then outlines the two methods of tinning, by dipping in molten tin and by electrodeposition. Section IV on grades is by far the largest section of the book and is principally devoted to the thickness or weight of the tin coating. The units in use for measuring and quoting tin coating thickness or weight are defined in the fullest detail. The customary and approved methods of sampling tinplates for determination of grade and quality are set out. In ordering tinplates not only the thickness of the tin coating but also the type, hot-dipped or electrolytic, and the finish given to it should be specified. Since the steel basis sheet is close to 99 per cent by weight of most tinplate, great importance attaches to obtaining a quality in this steel that is suitable for the operations it must undergo during fabrication. The testing of tinplate falls into two categories, physical and chemical, and the usual routine tests which are useful are given. The applications of various grades of tinplate are indicated in Section IX. An extensive glossary of over 100 terms in current use in the tinplate industry is given in English, French, German and Spanish. *Tinplate Handbook* (3rd (revised) edition) is available free of charge on request to: Tin Research Institute, Fraser Road, Perivale, Greenford.

## Plastics Bibliography

A SECOND SUPPLEMENT to the *Bibliography on Reinforced Plastics*, consisting of 10 pages of information on glass fibre and asbestos fibre reinforced plastics has been compiled by the British Plastics Federation and is available on application to the Federation offices at 47-48 Piccadilly, London W1. The original Bibliography, which costs one guinea, inclusive of the supplements, can be ordered direct from the Federation (or through any bookseller).

Copies of the very comprehensive Buyers' Guide to Plastics Materials and Machinery and Equipment can still be obtained from the Federation offices, price 2s 6d (post free, UK).

## Canadian Sulphur

### Plant Being Constructed at Montreal East

UNDER CONSTRUCTION at Montreal East, Canada's largest oil refining centre, is the Laurentide Chemical & Sulphur Co.'s new chemical plant which will manufacture elemental sulphur from petroleum gases. The \$1,250,000 plant will have a productive capacity of 33,000 long tons annually.

Sulphur will be recovered from hydrogen sulphide gases produced by five refiners in the area—British American Oil Co. Ltd., Canadian Petrofina Ltd., Imperial Oil Ltd., McColl-Frontenas Oil Co. Ltd., and Shell Oil of Canada—and one chemical company, Union Carbide Canada. At present the hydrogen sulphide is dispersed into the atmosphere or is being burned as fuel under refinery boilers.

### First in Field

Laurentide Chemical & Sulphur Co. will be the first company to offer domestically produced sulphur for general sale in Eastern Canada. (The only other producer is Noranda Mines Ltd., at its Port Robinson, Ontario, plant. All the sulphur produced is used at this company's sulphuric acid plant at Blind River, Ontario.)

US and Canadian interests are financing the new plant, which, it is hoped, will be in operation by late June next year. The sulphur produced will replace imported supplies now brought in from the US Gulf Coast area and currently selling at about \$30 a ton. The sulphur will be sold mainly to pulp and paper mills in the Montreal area.

## Lubricants

STUDIES of chlorofluorocarbons show they have exceptional potentialities as lubricants, according to the Battelle Institute Ltd., London. Technologists found that when used as lubricants, these chemicals exhibit great thermal stability, good load-carrying capacity, and stability in oxygen.

Chlorofluorocarbons are useful as lubricants for bearings operating under high loads, as lubricants and sealants for bearings and pistons operating under severe oxidising conditions, such as in oxygen compressors and pumps, and as additives to increase the load-carrying capacity and lubricating ability of natural and synthetic lubricants without diminishing the stability of the latter.

# SCIENCE & TECHNOLOGY AWARDS

## DSIR Now Responsible for Making Grants

BY ARRANGEMENT with the Ministry of Education and the Treasury, DSIR has assumed responsibility for making practically all fresh awards from public funds to post-graduate students in science and technology. Awards will be made for training in research as in the past, but in addition will also be made for courses of advanced instruction.

This new arrangement does not alter in any way the fields of science and technology covered by DSIR. Awards for training in medical and agricultural science will be made, as they are now, by other bodies.

Students having a good Honours degree and seeking two or three years of supervised training in research, leading in most cases to a Doctorate of Philosophy are eligible for DSIR studentships.

DSIR advanced course studentships will be made to select postgraduate students wishing to attend courses of advanced instruction in science and technology. Subjects will include aircraft design, chemical engineering, applied electronics, soil mechanics and fuel technology, and courses must be not less than six months in length.

Students who have recently graduated with honours, or hope shortly to do so, should apply to the heads of

departments at universities and colleges. Applications have to reach DSIR from heads of departments where students hope to work by 1 March 1957. Selection will be on the recommendation of a postgraduate training grants committee, drawn largely from the universities.

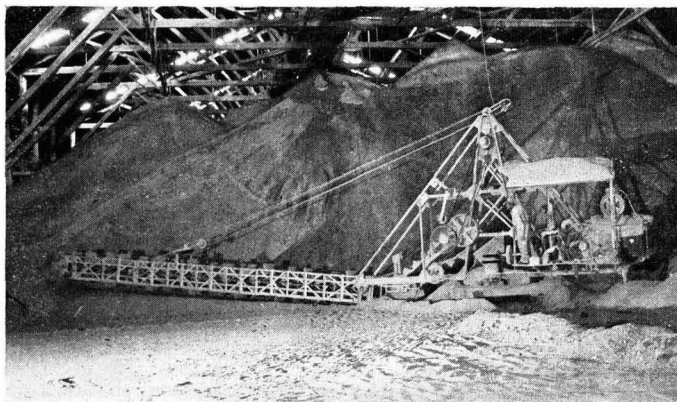
## Radioisotope Courses

FULL-TIME courses on radioisotopes and their uses will be held in the department of chemistry, Sir John Cass College, Jewry Street, Aldgate, London EC3, beginning on Monday 14 January 1957. These courses, each of four weeks' duration, will be repeated every term and, if necessary, will be modified to suit the needs of those attending.

The courses will be an introduction to the use of radioisotopes and radioactivity measuring techniques for qualified engineers, physicists, chemists, biologists and medical practitioners who wish to use these methods in their specialised fields. Emphasis will be placed on practical work, lectures occupying only a small part of the courses. Visits will be arranged during the courses to establishments where radioisotopes are being used.

Fee for the course is £30.

## SUPERPHOSPHATE IN AUSTRALIA



Importance of primary production in the Australian economy has created a demand for an up-to-date superphosphate industry. Factories in Victoria are producing 300,000 tons of sulphuric acid annually, the bulk of which is used for manufacture of about 750,000 tons of superphosphate. This production is shared between three companies which receive supplies of rock phosphate raw material from Nauru and Ocean Islands in the Pacific, 465,000 tons being required for Victorian superphosphate production. Sulphuric acid is manufactured in the main from brimstone imported from the US, although some Australian pyrites are used. This illustration shows a boom excavator at a superphosphate plant in Melbourne, recovering superphosphate from a storage pile. (Australian News & Information Bureau)

## Incentives

### Productivity Group of ABCM Gets TU Views

INCENTIVES in the chemical and allied industries were discussed at a conference held in Edinburgh on 9 November under the auspices of the Scottish Area Productivity Group of the Association of British Chemical Manufacturers.

Mr. E. Higgins, a trade union representative on the JIC, pointed out that there were managements which did not approve of incentive schemes believing that workers should give a full return for salaries. Incentive schemes did three things he said. They improved productivity, lowered costs and so helped to establish a higher standard of living. Some incentive schemes had been discarded but he thought that those based on sound work study could be 'sold' to the workers by initial discussion with the unions, with shop stewards and with the workers on the shop floor. But schemes must be explained in detail and used first on a trial basis.

In the discussion the need for assessment of quality in production and not on physical effort and time alone was stressed. Modern production methods might mean that physical effort was limited to 10 minutes in 60 but by attention and interest the worker could influence the quality of the output and this made it necessary to assess work study measurement on machine output and quality standards.

## Equipment for Switzerland

ACTING as consultants to Landis & Gyr AG for the instrumentation of the new high-power Swiss 20 megawatt materials testing heavy water moderated reactor which is being designed and built by Reaktoh AG is the British company Isotope Developments Ltd. The company is responsible for the recommendation and supply of the full nucleonic instrumentation, which includes the equipment for the channels for controlling and safeguarding the reactor and its surroundings.

The contract was won against competition from the US and testifies to the high standard of British equipment and progress in this field of instrumentation. Isotope Developments Ltd. have supplied nucleonic instrumentation for the AEI swimming pool reactors, models of which have been sold to AWRE Aldermaston and to overseas countries, including Germany. They also supply nucleonic instruments to the UKAEA at Calder Hall and Harwell.

## Scots Oil Supplies

DISQUIET among Scottish industrialists over the possibility of an oil shortage in the event of military activities was referred to in Glasgow recently by Sir Patrick Dollan, chairman of the Scottish Fuel Efficiency Committee.

Sir Patrick, who was giving the opening address at a conference on 'Oil Firing of Industrial and Commercial Boiler Plants' convened by the Combustion Engineering Association, said that he had discussed the question of supplies with representatives of some of the biggest oil users in Scotland. They were afraid that if a military situation arose their oil stocks would be sufficient for only eight to 10 days. This would mean that it would become impossible to manufacture material and equipment that were essential in war, or in any military situation akin to war.

He thought the powers of the Minister of Fuel and Power should be extended so that 'he could speak for all industries and let those responsible for international policies understand the situation before action was taken that might land us in an unfortunate plight.'

## KID Exemptions

THE TREASURY has made an Order under section 10 (5) of the Finance Act, 1926, exempting the following chemicals from Key Industry Duty for the period 12 November 1956—18 February 1957.

Synthetic organic chemicals, analytical reagents, other fine chemicals and chemicals manufactured by fermentation processes, the following: *o*-monoChloroacetophenone; diacetyl; dicyandiamidine phosphate; formdimethylamide; methyl vinyl ketone, the ketone content of which, calculated as methyl vinyl ketone, is not less than 90 per cent by weight; 6-*n*-propyl-2-thiouracil; tetrapotassium pyrophosphate; 2-thiouracil; *cis*-3:3:5-trimethylcyclohexanol of a purity not less than 90 per cent.

This Order is the Safeguarding of Industries (Exemption) (No. 8) Order, 1956, and is published as SI1956/1735. Copies may be obtained from HM Stationery Office, London WC2.

## SAC Address

ADDRESS of The Society for Analytical Chemistry, *The Analyst, Analytical Abstracts* and the Analytical Methods Committee is now: 14 Belgrave Square, London SW1. BEL-gravia 3258.

## BS Revised

### Aminoplastic Moulding Materials

REVISED BRITISH STANDARD for Aminoplastic moulding materials (BS 1322:1956) is one of a series dealing with plastics materials. It is restricted to moulding materials, whereas the 1946 edition also dealt with mouldings. Three types of aminoplastic moulding materials are affected:

Type A: General. Includes cellulose-filled (former type UX) and wood-filled urea-formaldehyde (former type U) materials.

Type M: with improved resistance to hot water. Normally a cellulose-filled melamine-formaldehyde material.

Type H: with improved electrical properties at high temperature. Includes moulding materials (usually melamine-formaldehyde) with mineral fillers such as asbestos and glass-fibre.

A simple statistical technique for control of quality has been adopted which takes into account casual variations inherent in methods of test, but ensures that average quality of the material is not merely the bare minimum to meet the lower limit.

Requirements are specified for the following twelve properties together with tests: cross-breaking strength, impact strength, boiling water absorption, surface resistivity after immersion in water, volume resistivity, power factor, permittivity, tensile strength, cold water absorption, plastic yield, electric strength, tracking.

Copies of this standard are obtainable from the British Standards Institution, Sales Branch, 2 Park Street, London W1, price 5s.

## BTL Services

SINCE the announcement that Baird & Tatlock (London) Ltd. have been appointed authorised agents in the United Kingdom for Beckman Instrument Inc., a number of spectrophotometers, including the popular DK.2 recording instruments, have been installed by them in laboratories in the British Isles including Northern Ireland.

The company call attention to the services of the BTL technical sales department, and also point out that Munich-trained representatives are at the disposal of customers in connection with the use of these instruments.

An illustrated brochure outlining the facilities offered by Baird & Tatlock (London) Ltd. and other literature on Beckman instruments are available on request.

# British Chemical Prices

(These prices are checked with the manufacturers, but it must be pointed out that in many cases there are variations according to quantity, quality, place of delivery, etc.)

**LONDON** Trade in most sections of the industrial chemicals market has remained steady. Uncertainties of the Middle East situation have led to some increase in buying interest in products likely to be affected by shipping delays, but the price position generally is unchanged with, perhaps, a firmer undertone. Soda products are moving well against contracts and the call for the potash chemicals remains good. Sulphate of copper and the lead compounds are steady at the revised prices given last week. Key industry duty has been reimposed on phthalic anhydride. Trade in the coal-tar products market has followed a steady course with home demand satisfactory. Export inquiry for creosote oil and cresylic acid has been moderate.

**MANCHESTER** Soda and potash compounds are

being taken up steadily against contracts and satisfactory deliveries are also reported for the ammonia and magnesium products and most other leading heavies. Home and shipping inquiry has been on a fair scale. With an odd exception prices are on a firm basis and market opinion is that changes are likely to be upward. Basic slag and compounds, among the fertilisers, are moving steadily to the consuming end, as are most of the light and heavy tar products.

**GLASGOW** A steady demand has been maintained during the past week in the Scottish market. Business has been brisk with a good request for spot and forward deliveries. On the agricultural side the position has been satisfactory for the time of year. In general, prices have been fairly firm.

## General Chemicals

**Acetic Acid.**—Per ton: 80% technical, 10 tons, £91; 80% pure, 10 tons, £97; commercial glacial, 10 tons, £99; delivered buyers' premises in returnable barrels (technical acid barrels free); in glass carboys, £8; demijohns, £12 extra.

**Acetic Anhydride.**—Ton lots d/d, £132 per ton.

**Alum.**—Ground, about £25 per ton, f.o.r. MANCHESTER: Ground, £25.

**Aluminium Sulphate.**—Ex-works, £15 10s per ton d/d. MANCHESTER: £15 15s to £18 10s.

**Ammonia, Anhydrous.**—1s 9d to 2s 3d per lb.

**Ammonium Chloride.**—Per ton lot, in non-returnable packaging, £29 2s 6d.

**Ammonium Nitrate.**—D/d, £31 per ton (in 4-ton lots).

**Ammonium Persulphate.**—MANCHESTER: £6 2s 6d per cwt., in 1-cwt. lots, delivered. £112 10s per ton, in minimum 1-ton lots, delivered.

**Ammonium Phosphate.**—Mono- and di-, ton lots, d/d, £106 and £97 10s per ton.

**Antimony Sulphide.**—Crimson, 4s 5d to 4s 10½d; golden, 2s 8½d to 4s 1½d; all per lb., delivered UK in minimum 1-ton lots.

**Arsenic.**—Per ton, £45 to £50 ex store.

**Barium Carbonate.**—Precip., d/d; 4-ton lots, £41 per ton, bag packing.

**Barium Chloride.**—£49 per ton in 2-ton lots.

**Barium Sulphate (Dry Blanc Fixe).**—Precip., 2-ton lots, £35 per ton d/d.

**Bleaching Powder.**—£28 12s. 6d per ton in returnable casks, carriage paid station, in 4-ton lots.

**Borax.**—Per ton for ton lots, in hessian sacks, carriage paid: Technical, anhydrous, £62 10s; granular, £42; crystal, £44 10s; powder, £45 10s; extra fine powder, £46 10s; BP, granular, £51; crystal, £53 10s; powder, £54 10s; extra fine powder, £55 10s.

**Boric Acid.**—Per ton for ton lots, in hessian sacks, carriage paid: Technical, granular, £71; crystal, £79; powder, £76 10s; extra fine powder, £78 10s; BP granular, £84; crystal, £91; powder, £88 10s; extra fine powder, £90 10s.

**Calcium Chloride.**—Per ton lots, in non-returnable packaging: solid and flake, £16.

**Chlorine, Liquid.**—£38 5s per ton, in returnable 16-17-cwt. drums, delivered address in 3-drum lots.

**Chromic Acid.**—2s 0½d per lb., less 2½%, d/d UK, in 1-ton lots.

**Chromium Sulphate, Basic.**—Crystals, 8½d per lb. delivered, £75 16s 8d per ton.

**Citric Acid.**—1-cwt. lots, £10 5s cwt.

**Cobalt Oxide.**—Black, delivered, bulk quantities, 13s 2d per lb.

**Copper Carbonate.**—3s 9d per lb.

**Copper Sulphate.**—£94 10s per ton f.o.b., less 2% in 2-cwt. bags.

**Cream of Tartar.**—100%, per cwt., about £11 12s.

**Formaldehyde.**—£37 5s. per ton in casks, d/d.

**Formic Acid.**—85%, £86 10s in 4-ton lots, carriage paid.

**Glycerine.**—Chemically pure, double distilled 1.260 SG, £10 1s 6d per cwt. Refined pale straw industrial, 5s per cwt. less than chemically pure.

**Hydrochloric Acid.**—Spot, about 12s per carboy d/d, according to purity, strength and locality.

**Hydrofluoric Acid.**—59/60%, about 1s 6d per lb.

**Hydrogen Peroxide.**—27.5% wt., £128 10s per ton. 35% wt., £158 per ton d/d. Carboys extra and returnable.

**Iodine.**—Resublimed BP, under cwt. 14s 10d, 13s 11d per cwt.

**Iodoform.**—under cwt. £1 3s 5d, £1 2s 6d per cwt.

**Lactic Acid.**—Pale tech., 44% by weight, 14d per lb.; dark tech., 44% by weight, 9d per lb., ex-works; chemical quality, 44% by weight, 12½d per lb., ex-works; 1-ton lots, usual container terms.

**Lead Acetate.**—White: About £150 per ton.

- Lead Nitrate.**—About £135 1-ton lots.
- Lead, Red.**—Basis prices per ton. Genuine dry red, £147; orange lead, £159. Ground in oil: red, £164 10s; orange, £176 10s.
- Lead, White.**—Basis prices: Dry English in 5-cwt. casks £151 10s per ton. Ground in oil: English, 1-cwt. lots 194s per cwt.
- Lime Acetate.**—Brown, ton lots, d/d, £40 per ton; grey, 80-82%, ton lots, d/d, £45 per ton.
- Litharge.**—£149 per ton, in 5-ton lots.
- Magnesite.**—Calcined, in bags, ex-works, about £21 per ton.
- Magnesium Carbonate.**—Light, commercial, d/d, 2-ton lots, £84 10s per ton, under 2 tons, £97 per ton.
- Magnesium Chloride.**—Solid (ex-wharf), £16 10s per ton.
- Magnesium Oxide.**—Light, commercial, d/d, under 1-ton lots, £245 per ton.
- Magnesium Sulphate.**—Crystals, £16 per ton.
- Mercuric Chloride.**—Technical powder, £1 3s per lb., in 1-ton lots; smaller quantities dearer.
- Mercury Sulphide, Red.**—£1 9s 3d per lb., for 5-cwt. lots.
- Nickel Sulphate.**—D/d, buyers UK £170 per ton. Nominal.
- Nitric Acid.**—80° Tw., £35 per ton.
- Oxalic Acid.**—Home manufacture, minimum 4-ton lots, in 5-cwt. casks, about £131 per ton, carriage paid.
- Phosphoric Acid.**—Technical (s.g. 1.700) ton lots, carriage paid, £100 per ton; BP (s.g. 1.750), ton lots, carriage paid, 1s 4d per lb.
- Potash, Caustic.**—Solid, £93 10s per ton for 1-ton lots; liquid, £34 15s.
- Potassium Carbonate.**—Calcined, 96/98%, about £74 10s per ton for 1-ton lots, ex-store.
- Potassium Chloride.**—Industrial, 96%, 1-ton lots, about £24 per ton.
- Potassium Dichromate.**—Crystals and granular, 1s 1½d per lb., in 5-cwt. to 1-ton lots, d/d UK.
- Potassium Iodide.**—BP, under cwt. 11s 7d, 11s 1d per cwt.
- Potassium Nitrate.**—In 4-ton lots, in non-returnable packaging, paid address, £63 10s per ton.
- Potassium Permanganate.**—BP, 1-cwt. lots, 1s 9d per lb.; 3-cwt. lots, 1s 8½d per lb.; 5-cwt. lots, 1s 8d per lb.; 1-ton lots, 1s 7¾d per lb.; 5-ton lots, 1s 7¼d per lb.; Tech., 5-cwt. packed in 1-cwt. drums, £8 14s 6d per cwt.; packed in 1 drum, £8 9s 6d per cwt.
- Salammoniac.**—Per ton lot, in non-returnable packaging, £45 10s.
- Salicylic Acid.**—MANCHESTER: Technical 2s 8½d per lb. d/d.
- Soda Ash.**—58% ex-depot or d/d, London station, about £16 8s per ton, 1-ton lots.
- Soda, Caustic.**—Solid 76/77%; spot, £32 6s 6d per ton d/d (4 ton lots).
- Sodium Acetate.**—Commercial crystals, £91 per ton d/d.
- Sodium Bicarbonate.**—Per ton lot, in non-returnable packaging, £17.
- Sodium Bisulphite.**—Powder, 60/62%, £42 15s d/d in 2-ton lots for home trade.
- Sodium Carbonate Monohydrate.**—Per ton lot, in non-returnable packaging, paid address, £57.
- Sodium Chlorate.**—About £80 per ton in 1-cwt. drums, carriage paid station, in 4-ton lots.
- Sodium Cyanide.**—96/98%, £113 5s per ton lot in 1-cwt. drums.
- Sodium Dichromate.**—Crystals, cake and powder, 11½d per lb. Net d/d UK, anhydrous, 1s 1d per lb. Net del. d/d UK, 5-cwt. to 1-ton lots.
- Sodium Fluoride.**—Delivered, 1-ton lots and over, £5 per cwt.; 1-cwt. lots, £5 10s per cwt.
- Sodium Hyposulphite.**—Pea crystals, £35 15s a ton; commercial, 1-ton lots, £32 10s per ton, carriage paid.
- Sodium Iodide.**—BP, under cwt. 15s 1d, 14s 2d per cwt.
- Sodium Metaphosphate (Calgon).**—Flaked, paper sacks, £133 per ton.
- Sodium Metasilicate.**—£25 per ton, d/d UK in ton lots, loaned bags.
- Sodium Nitrate.**—Chilean refined granulated over 98% 6-ton lots, d/d station, £28 10s per ton; £29 10s per ton on and after 1st December.
- Sodium Nitrite.**—£32 per ton (4-ton lots).
- Sodium Percarbonate.**—12½% available oxygen, £8 6s 9d per cwt. in 1-cwt. kegs.
- Sodium Phosphate.**—Per ton d/d for ton lots; disodium, crystalline, £40 10s, anhydrous, £88; trisodium, crystalline, £39 10s, anhydrous, £86.
- Sodium Silicate.**—75-84° Tw. Lancashire and Cheshire, 4-ton lots, d/d station in loaned drums, £10 15s per ton; Dorset, Somerset and Devon, £3 17s 6d per ton extra; Scotland and S. Wales, £3 per ton extra. Elsewhere in England, excluding Cornwall and Wales, £1 12s 6d per ton extra.
- Sodium Sulphate (Desiccated Glauber's Salts).**—D/d in bags ton, £18.
- Sodium Sulphate (Glauber's Salt).**—£9 5s to £10 5s per ton d/d.
- Sodium Sulphate (Salt Cake).**—Unground, £6 per ton d/d station in bulk. MANCHESTER: £7 per ton d/d station.
- Sodium Sulphide.**—Solid, 60/62%, spot, £33 2s 6d per ton, d/d, in drums in 1-ton lots; broken, £34 2s 6d per ton, d/d, in drums in 1-ton lots.
- Sodium Sulphite.**—Anhydrous, £66 5s per ton; commercial, £25 5s to £27 per ton d/d station in bags.
- Sulphur.**—Per ton for 4 tons or more, ground, £20 to £22, according to fineness.
- Sulphuric Acid.**—Net, naked at works, 168° Tw. according to quality, per ton, £10 7s 6d to £12; 140° Tw., arsenic free, per ton, £8 12s 6d; 140° Tw., arsenious, per ton, £8 4s 6d.
- Tartaric Acid.**—Per cwt.: 10 cwt. or more £13 10s, one cwt., £13 15s.
- Titanium Oxide.**—Standard grade comm., with rutile structure, £172 per ton; standard grade comm., with anatase structure, £154 per ton.
- Zinc Oxide.**—Maximum price per ton for 2-ton lots, d/d, white seal, £115; green seal, £113; red seal, 2-ton lots, £110 per ton.



## Solvents &amp; Plasticisers

**Acetone.**—Small lots: In 5-gal. cans: 5-gal., £125, 10-gal. and upward, £115, cans included. In 40/45 gal. returnable drums, spot: Less than 1 ton, £90; 1 to less than 5 tons, £87; 5 to less than 10 tons, £86; 10 tons and upward, £85. In tank wagons, spot: 1 to less than 5 tons (min. 400 gal.), £85; 5 to less than 10 tons (1,500 gal.), £84; 10 tons and upward (2,500 gal.), £83; contract rebate, £2. All per ton d/d.

**Butyl Acetate BSS.**—£165 per ton, in 10-ton lots.

**n-Butyl Alcohol BSS.**—10 tons, in drums, £152 per ton d/d.

**sec-Butyl Alcohol.**—5 gal. drums, £159; 40 gal. drums: less than 1 ton, £124 per ton; 1 to 10 tons, £123 per ton; 10 tons and over, £119 per ton; 100 tons and over, £120 per ton.

**tert-Butyl Alcohol.**—5-gal. drums, £195 10s per ton; 40/45 gal. drums: less than 1 ton, £175 10s per ton; 1 to 5 tons, £174 10s per ton; 5 to 10 tons, £173 10s; 10 tons and over, £172 10s.

**Diacetone Alcohol.**—Small lots: 5-gal. drums, £177 per ton; 10-gal. drums, £167 per ton. In 40/45 gal. drums: less than 1 ton, £142 per ton; 1 to 9 tons, £141 per ton; 10 to 50 tons, £140 per ton; 50 to 100 tons, £139 per ton; 100 tons and over, £138 per ton.

**Dibutyl Phthalate.**—In drums, 10 tons, 2s per lb. d/d; 45-gal. drums, 2s 1½d per lb. d/d.

**Diethyl Phthalate.**—In drums, 10 tons, 1s 11½d per lb. d/d; 45 gal. drums, 2s 1d per lb. d/d.

**Dimethyl Phthalate.**—In drums, 10 tons, 1s 9½d per lb. d/d; 45 gal. drums, 1s 10½d per lb. d/d.

**Diocetyl Phthalate.**—In drums, 10 tons, 2s 8d per lb. d/d; 45 gal. drums, 2s 9½d per lb. d/d.

**Ether BSS.**—In 1 ton lots, 1s 11d per lb.; drums extra.

**Ethyl Acetate.**—10 ton lots, d/d, £135 per ton.

**Ethyl Alcohol (PBS 66 o.p.).**—Over 300,000 p. gal., 2s 11½d; 2,500-10,000 p. gal., 3s 1½d per p. gal., d/d in tankers. D/d in 40/45-gal. drums, 1d p.p.g. extra.

Absolute alcohol (75.2 o.p.) 5d p.p.g. extra.

**Methanol.**—Pure synthetic, d/d, £43 15s per ton.

**Methylated Spirit.**—Industrial 66° o.p.: 500 gal. and over in tankers, 5s 4d per gal. d/d; 100-499 gal. in drums, 5s 8½d per gal. d/d. Pyridinised 64 o.p.: 500 gal. and over in tankers, 5s 6d per gal. d/d; 100-499 gal. in drums, 5s 10½d per gal. d/d.

**Methyl Ethyl Ketone.**—10-ton lots, £140 per ton d/d.

**Methyl isoButyl Ketone.**—10 tons and over, £159 per ton.

**isoPropyl Acetate.**—In drums, 10 tons, £130 per ton d/d; 45-gal. drums, £136 per ton d/d.

**isoPropyl Alcohol.**—Small lots: 5-gal. drums, £118 per ton; 10-gal. drums, £108 per ton; in 40-45 gal. drums: less than 1 ton, £83 per ton; 1 to 9 tons, £81 per ton; 10 to 50 tons, £80 10s per ton; 50 tons and over, £80 per ton.

## Rubber Chemicals

**Carbon Disulphide.**—£61 to £67 per ton, according to quality.

**Carbon Black.**—8d to 1s per lb., according to packing.

**Carbon Tetrachloride.**—Ton lots, £81 per ton.

**India-Rubber Substitutes.**—White, 1s 6½d to 1s 10½d per lb.; dark, 1s 3d to 1s 5½d per lb. delivered free to customers' works.

**Lithopone.**—30%, about £55 per ton.

**Mineral Black.**—£7 10s to £10 per ton.

**Sulphur Chloride.**—British, about £50 per ton.

**Vegetable Lamp Black.**—£64 8s per ton in 2-ton lots.

**Vermilion.**—Pale or deep, 15s 6d per lb. for 7-lb. lots.

## Coal-Tar Products

**Benzole.**—Per gal., minimum of 200 gals. delivered in bulk, 90's, 5s; pure, 5s 4d.

**Carbolic Acid.**—Crystals, minimum price 1s 4d per lb. delivered in bulk, ½d per lb. extra in 40/50 gal. returnable drums. Crude, 60's, 8s per gal. MANCHESTER: Crystals, 1s 4d to 1s 7d per lb., d/d crude, 8s naked, at works.

**Creosote.**—Home trade, 1s to 1s 9d per gal. according to quality, f.o.r. maker's works. MANCHESTER: 1s to 1s 8d per gal.

**Cresylic Acid.**—Pale 99/100%, 6s 4d per gal.; 99.5/100%, 6s 6d per gal. D/d UK in bulk: Pale ADF from 7s 3d per imperial gallon f.o.b. UK, 95 cents per US gallon, c.i.f. NY.

**Naphtha.**—Solvent, 90/160°, 5s per gal.; heavy, 90/190°, 3s 11d per gal. for bulk 1,000-gal. lots, d/d. Drums extra; higher prices for smaller lots.

**Naphthalene.**—Crude, 4-ton lots, in buyers' bags, £21 11s to £35 2s 6d per ton nominal, according to m.p.; hot pressed, £47 7s 6d per ton in bulk ex-works; refined crystals, £68 per ton d/d min. 4-ton lots.

**Pitch.**—Medium, soft, home trade, £9 per ton f.o.r. suppliers' works; export trade about £10 10s per ton f.o.b. suppliers' port.

**Pyridine.**—90/160, 20s to £1 2s 6d per gal.

**Toluole.**—Pure, 5s 9d; 90's 5s 0d per gal. d/d, 1,000 gal. in bulk. MANCHESTER: Pure, 5s 9d per gal. naked.

**Xylole.**—5s 11½d to 6s 3½d per gal., according to grade, in 1,000 gal. lots d/d London area in bulk.

Intermediates & Dyes  
(Prices Nominal)

**m-Cresol** 98/100%.—4s 9d per lb. d/d.

**o-Cresol** 30/31°C.—1s per lb. d/d.

**p-Cresol** 34/35°C.—4s 9d per lb. d/d.

**Dichloraniline.**—4s 6d per lb.

**Dinitrobenzene.**—88/99°C., 2s 1d per lb.

**Dinitrotoluene.**—SP 15° C., 2s 1½d per lb.; SP 26° C., 1s 5d per lb.; SP 33° C., 1s 2½d per lb.; SP 66/68° C., 1s 11d per lb. Drums extra.

**p-Nitraniline.**—5s 1d per lb.

**Nitrobenzene.**—Spot, 10d per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyers' works.

**Nitronaphthalene.**—2s 5½d per lb.

**o-Toluidine.**—1s 11d per lb., in 8/10-cwt. drums, drums extra.

**p-Toluidine.**—6s 1d per lb., in casks.

**Dimethylaniline.**—3s 5d per lb., drums extra, carriage paid.



# Chemist's Bookshelf

**CHROMIUM. VOL. 1. CHEMISTRY OF CHROMIUM & ITS COMPOUNDS.** Edited by MARVIN J. UDY. Reinhold Publishing Corp., New York; Chapman & Hall Ltd., London. 1956. Pp. 433. 88s.

This book is the first of two volumes, in which all the phases of the manufacture and uses of chromium metal, chromium alloys and chromium chemicals are being dealt with by some 36 different authors, all specialists in the particular aspect of chromium science and technology on which they write. The second volume will deal with the physical properties of chromium and its alloys, their manufacture and use as metals and alloys, and the use of chromium compounds in the manufacture of refractories.

The first volume is divided into two main sections. The first section (general), includes chapters on the history of chromium by the editor; the mineralogy and geology of chromium by T. P. Thayer; the analytical chemistry of chromium by E. J. Serfass and R. F. Muraca; the relation of chromium to health by A. M. Baetjer; and chromium in soils, plants and animals by G. K. Davis. The second section, dealing with the properties of chromium compounds, contains accounts of the physical and chemical properties of chromium compounds by the editor; the industrial uses of chromium chemicals by M. Darrin; the production of chromium chemicals by R. L. Copson; the use of chromium chemicals in the textile industry by C. L. Howarth, in the tanning industry by R. M. Lollar, in wood preservation by H. W. Angell and W. H. Hartford, and in corrosion prevention by H. A. H. Pray; the manufacture and properties of chromium pigments by V. H. Chalupski; the applications of chromium chemicals in the graphic arts by G. W. Jorgensen and M. H. Bruno and in the oil and gas industries by M. Darrin.

When this two-volume monograph has been completed the chemist and engineer should have at their disposal a valuable collection of the latest information on the properties and applications of chromium and its compounds. G.S.E.

**CHEMICAL MARKET RESEARCH IN PRACTICE.** Edited by R. E. CHADDOCK. Reinhold Publishing Corp., New York; Chapman & Hall Ltd., London. 1956. Pp. 196. 24s.

Because of the very scanty amount of information published upon the subject of chemical market surveying it is surprising to read in this book that there has been in existence for 16 years in the United States an organisation devoted to the furthering of market research. It is equally surprising to find that the book, written jointly by 22 members of the organisation, is a condensation of a course of university lectures.

It would appear that only in the United States is the mental soil fertile enough for these unusual hybrids of science, business and philosophy to flower in the university curriculum. In view of the stubborn rear-guard action being fought by the faculties of art against the encroachment of technology in our own universities, it seems likely that this book will provide our only means of access to such lectures for many years and as such it has a unique value.

Much of the information and many of the ideas expressed will be new to readers on this side of the Atlantic, particularly the view that the weakest link in chemical marketing is 'low-pressure salesmanship.'

The first part of the book is historical in character; it is followed by a description of how to use the literature, how to carry out field work and how to present the results of a survey.

The value of such surveys to managements, and their integration with research and development is discussed with conviction, but the weaknesses of the technique are mentioned only obliquely and may be best illustrated by the following quotation: 'A detailed study of sulphuric acid uses would be necessary to evaluate properly the changing pattern of sulphur requirements.'

The most interesting section of the text is that in which the various sections of the chemical industry are examined in historical perspective with the aid of graphs and statistics. At the end of each section is given a list of the sources of information upon which the authors have drawn in composing their surveys. These lists are surprisingly short when compared with even the most modest and restricted theoretical review.

J. R. MAJER

## Coal & Chemicals

A MONOGRAPH entitled *Coal as a Raw Material* (L.M. & R., 1956, No. 3), has been developed from the special lecture with this title given by Dr. Walter Idris Jones, Director-General of Research, National Coal Board, at the Anniversary Meetings of the RIC held at Cardiff in April this year. The author discusses the constitution of coal, high temperature carbonisation, the future of organic chemicals from high-temperature carbonisation, smokeless fuels and chemicals by low-temperature carbonisation and the National Coal Board's research on this type of production, developments in coal gasification, gas for liquid fuels and chemicals, chemicals and fuels by coal hydrogenation, chemicals from carbonisation gases, coal as a source of carbon and miscellaneous products from coal.

Copies of this monograph are available from the Royal Institute of Chemistry, 30 Russell Square, London WC1.

## Commercial Intelligence

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

### Mortgages & Charges

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.

EVERSHED & VIGNOLES LTD., London W, engineers. 22 October, debenture to Westminster Bank Ltd., securing all moneys due or to become due to the bank; general charge (subject to etc.). \*Nil. 10 November 1955.

### Satisfactions

BRITISH CELANESE LTD., London W. Satisfaction 29 October, of debenture stock registered 2 October 1943 and 8 November 1944, to the extent of £16,862.

PILKINGTON BROTHERS LTD., Liverpool, glass manufacturers. Satisfaction 25 October, of debenture stock registered 13 November 1947, to the extent of £1,000.

### Increases of Capital

RICHARD SMITH LTD. (23,549), dealers in acids, etc., Lime Wharf, Chemical Works, Falkirk, increased by £25,000, in 5s ordinary shares, beyond the registered capital of £25,000.

BUILDERS CHEMICALS LTD. (343,065), 64 Reid Park Road, Newcastle-on-Tyne 2, increased by £9,000, in £1 ordinary shares, beyond the registered capital of £1,000.

CECA (NORTHERN IRELAND) LTD. (541,756), manufacturers of activated charcoal & other chemicals, etc., 175 Piccadilly, London W1, increased by £50,000 in £1 ordinary shares beyond the registered capital of £50,000.

SIKA LTD. (216,088), 82 Victoria Street, London SW1, increased by £20,000 in £1 ordinary shares, beyond the registered capital of £40,000.

### Change of Name

SANA CHEMICAL PRODUCTS LTD. (552,218), manufacturers of perfumes, etc., 1a Shelton Street, London WC2, changed to Denger Trading Co. Ltd., on 19 October 1956.

## New Registrations

### Grevos Chemicals Ltd.

Private company (574,239). Registered 14 November. Capital £10,000 in £1 shares. Objects: To carry on the business of manufacturers of and dealers in all kinds of industrial and other chemicals, etc. The subscribers each with one share are: M. B. Van Raalt, 75 Westfield Avenue, Sanderstead, Surrey, importer; and Chemische Fabriek 'Grevos' NV, Driebergen, Netherlands. The first directors are Andries Voskamp and Berend J. Voskamp. Solicitors: Bulcraig & Davis, Amberley House, Norfolk Street, London WC2.

### H. Thompson & Company's Idolice Specialities Ltd.

Private company (574,118). Registered 12 November. Capital £10,000 in £1 shares. Objects: To acquire the business of a manufacturing chemist carried on by George O. Thompson at The Cross, Burton Latimer, etc. The directors are: George O. Thompson and Mrs. Dorothy Thompson, both of Drowpits Farm, Weekley, Northants. Secretary: Dorothy Thompson. Solicitors: Toller Son & Hales, Kettering. Registered office: The Cross, Burton Latimer, Northants.

## COMPANY NEWS

### Peter Brotherhood Ltd.

Trading profit, before taxation, of £299,908 against £367,864 for last year was made by Peter Brotherhood Ltd., manufacturers of air, gas and refrigerator compressors for the chemical and fertiliser industries. In the course of a speech at the 49th ordinary general meeting, held on 13 November, Mr. A. Marcus Neal, chairman, attributed this reduction to the large proportion of Government work on the books on which profit was somewhat narrow, and to keener competition. Net profit after tax was £142,908 and a final dividend of 15 per cent was paid, making a total for the year of 20 per cent less tax on the ordinary capital. For the immediate future Mr. Marcus Neal said: 'I do not expect profits for the current year, that is to 31 March 1957, to be any less satisfactory than those with which we are dealing today.'

### Export Licensing Control

A NEW Export of Goods (Control) (Consolidation) Order, 1956 has been announced by the Board of Trade. It incorporates the 1955 Consolidation Order and subsequent amendments for the convenience of exporters. No change is made in the law. Copies of the Order (SI 1956 No. 1702), can be obtained from HM Stationery Office, Kingsway, London WC2, and branches, or through any bookseller, price 1s 6d (by post, 1s 8d).

### Coke Research Centre

ORDERS have been placed for the erection of a new coke research centre at Chesterfield, Derbyshire. Mr. Leslie O'Connor, chairman of the British Coke Research Association, announcing this at the Association's seventh conference in London on 7 October, said that the research centre would comprise laboratories, offices and a full-scale test coking plant. The total cost of the project would be £500,000.

MANUFACTURERS' AGENTS FOR:

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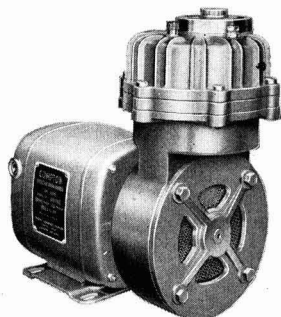
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This machine is of the diaphragm type and gives absolutely oil-free air. Very little maintenance is required as grease-packed and sealed

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The Compton Type D is suitable for many applications in Chemical Engineering and full details may be obtained from the manufacturers:

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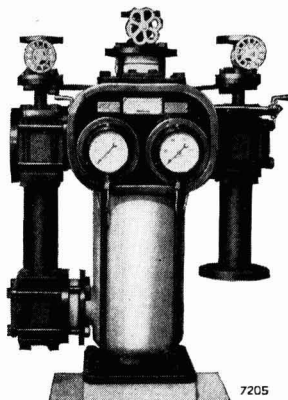


## SPECIAL STEAM EJECTOR AIR PUMP

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No metal parts in contact with corrosive gases.

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**COMPANY MEETINGS AND REPORTS:** £12.12.0 per column. Three column measure (approximately 360 words).

## SITUATIONS VACANT

### THE DISTILLERS COMPANY LIMITED CHEMISTS

The Company has several vacancies at its Research and Development Department, Epsom, Surrey, for male organic and physical chemists with good honours degrees or equivalent qualifications. Age not over 35 years. Some previous industrial experience, preferably in the field of polymerisation, would be desirable, but is not essential, and recent graduates will be considered. The work concerns fundamental and applied research on high polymers at laboratory and semi-technical levels. Salary according to qualifications and experience. Non-contributory pension scheme. Write: Staff Manager, The Distillers Co. Ltd., 21, St. James's Square, London, S.W.1. Quote Ref: 64/56.

**CHEMICAL ENGINEER** required to design equipment for the chemical processes of the photographic industry. Initially work will be on dye intermediates and couplers but will later include application of chemical engineering principles to the many types of process plant within the industry. Applicants should possess a degree and/or A.M.I. Chem.E. with preferably three to four years industrial experience. The position is permanent, progressive and pensionable on a non-contributory basis. Five day week and three weeks annual leave. Salary according to experience. WRITE PERSONNEL DEPT., KODAK LTD. (FACTORIES), WEALDSTONE, MIDDX.

**LAPORTE CHEMICALS LIMITED** has a vacancy in their modern research laboratories at Luton, Beds, for a **GRADUATE CHEMIST**, under 30 and preferably with some research experience. The successful applicant will join a section studying the decomposition of hydrogen peroxide and other peroxy compounds, and problems concerned with High Test Peroxide and its use as a propellant in rocket motors, etc. Prospects in this steadily expanding Group of Companies are good and a competitive salary will be paid. Good working conditions and recreational facilities are provided. Replies should be sent, quoting reference 27/d, to: **THE CHIEF CHEMIST, LAPORTE CHEMICALS LIMITED, P.O. BOX NO. 8, LUTON, BEDS.**

### E.M.I. ELECTRONICS LTD. ENGINEERING DEVELOPMENT DIVISION AN ASSISTANT CHEMIST,

with Honours Degree or Higher National in Chemistry, and some two to three years of experience in industry, is required by the Feltham Laboratories of the Company.

The work involves a wide range of development in association with the electronic industry. Good pay and conditions, excellent prospects. Please apply, in the first instance, giving full details to  
**PERSONNEL DEPARTMENT,  
E.M.I. ELECTRONICS LTD.,  
HAYES, MIDDX.**

Please quote reference number EL/E.24.

## SITUATIONS VACANT; continued

**ELECTRO-CHEMIST** required to be responsible for Technical aspects of plating and de-plating of component used in Radio Valve Manufacture. Should have H.N.C. or Degree in Chemistry and Physics. Specialist training given. Apply, giving details of experience, to: **PERSONNEL DEPARTMENT, M.O. VALVE CO. LTD., BROOK GREEN, HAMMERSMITH, W.6.**

An **INSTRUMENT ENGINEER** is required by the Central Engineering Department of Albright & Wilson Limited, Chemical manufacturers.

The Department is responsible for the design, erection and commissioning of new plant in the U.K. In common with the rest of the Chemical Industry a high degree of instrumentation has been achieved by the Company, and all new plant is highly instrumented.

He would be responsible to the Chief Instrument Engineer for the solution of instrument problems associated with new plant, and also for modification to existing plant.

A degree or equivalent qualification in mechanical or electrical engineering is desirable. Preference will be given to candidates with a wide experience rather than highly specialised knowledge of one branch of instrumentation.

The Company has a non-contributory life and superannuation scheme, and house purchase facilities are available.

Applications should be addressed to the **STAFF OFFICER, REF. 334, ALBRIGHT & WILSON LTD., P.O. BOX 3, OLDBURY, BIRMINGHAM**, stating briefly, age, qualifications and experience.

### THE DISTILLERS COMPANY LIMITED CHEMISTS

**THE RESEARCH DEPARTMENT OF THE COMPANY** has vacancies at its Research and Development Department, Epsom, Surrey, for male Graduates with good honours degrees in Chemistry, Biochemistry, or Botany, or equivalent qualifications. These appointments offer opportunities to the right men leading eventually to posts of managerial or executive responsibility. Age up to 35 years.

In the first instance, the work will be concerned with the application of biochemical methods to the study of metabolism, but will subsequently move towards the production of antibiotics and vitamins by microbial fermentation and investigation of their varied uses. Previous experience in these or related fields, which include Microbiological or Analytical Chemistry, would be desirable but is not essential; recent graduates are invited to apply. Salary according to qualifications and experience.

Non-contributory Pension Scheme.

Write:  
**STAFF MANAGER,  
THE DISTILLERS COMPANY LIMITED,  
21, St. James's Square,  
London, S.W.1.  
Ref. No. 65/56.**



## OFFICIAL APPOINTMENTS

**COUNTY BOROUGH OF BRIGHTON WATERWORKS  
DEPARTMENT  
ASSISTANT CHEMIST AND BACTERIOLOGIST  
(MALE OR FEMALE)**

Applicant should possess either Degree in Chemistry or A.R.I.C. Waterworks experience desirable but not essential.

Salary Grade A.P.T. III (£640-£767).

Appointment superannuable subject to medical examination terminable by one month's notice on either side.

Application forms from Waterworks Engineer, 12 Bond Street, Brighton.

W. O. DODD, Town Clerk, BRIGHTON  
19th October, 1956.

**ENGINEER (MAIN GRADE)**

required by the

**ATOMIC WEAPONS RESEARCH ESTABLISHMENT,  
ALDERMASTON, BERKS,**

to initiate the technical planning of Special Plant and equipment from basic information supplied by scientists. Candidates should have served a recognised apprenticeship and be corporate members of the Institution of Mechanical Engineers or hold equivalent qualifications. They must have a good knowledge of Industrial Chemistry and be able to evaluate the most suitable engineering principles to be adopted when initiating the technical planning of plant from flow sheets and other basic information. A knowledge of heat exchanger design would be considered an advantage. In addition, it is essential that they have had considerable practical experience in the chemical or allied industries, have a sound knowledge of instrumentation and be able to advise on materials of construction.

**SALARY**—£1,235-£1,655 p.a. (male).

Contributory superannuation scheme. A house or assistance towards legal expenses on house purchase will be available for married officers living beyond daily travelling distance.

Requests for application forms by **POSTCARD** to the Senior Recruitment Officer at the above address. Please quote Ref. A1258/38.

**EXPERIMENTAL OFFICER**

required by the

**ATOMIC WEAPONS RESEARCH ESTABLISHMENT  
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to be responsible for a small team engaged on General Chemical Analysis and the Analysis of Rare Metals. Applicants should be at least 26 years of age and possess Higher School Certificate (Science), Inter B.Sc., or equivalent, but possession of H.N.C. (Chemistry) or a General Degree would be an advantage. Experience in the handling of radio-active materials is desirable.

**SALARY**—£940-£1,155 p.a. (male).

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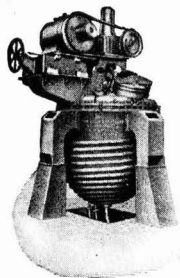
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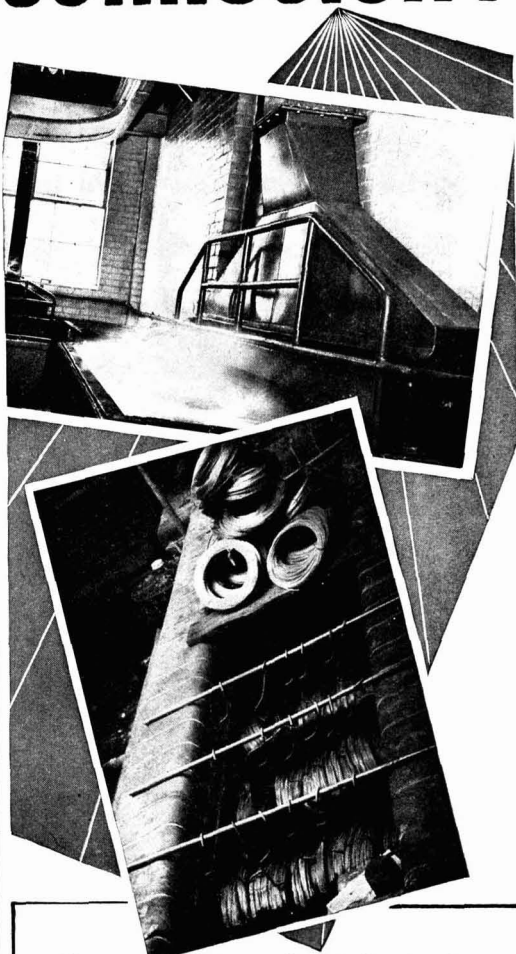
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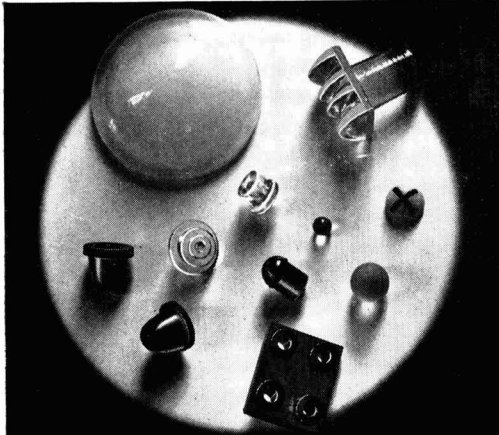
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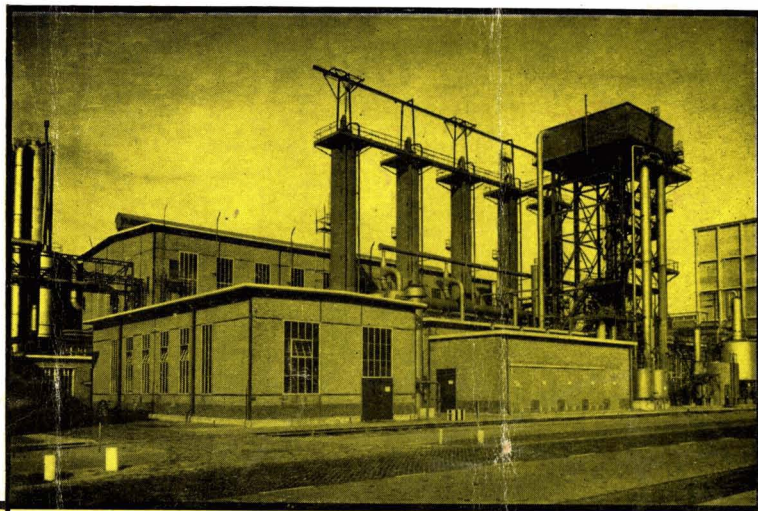
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