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VOL. 86 No. 2202

23 SEPTEMBER 1961

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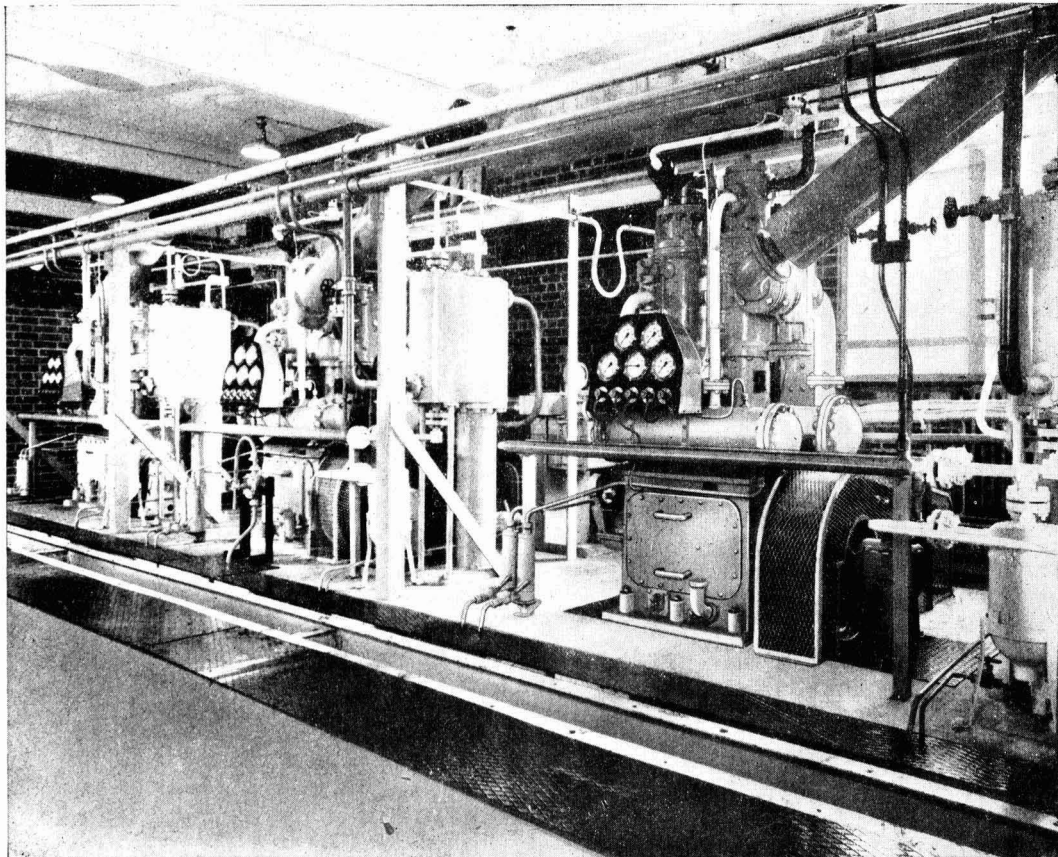
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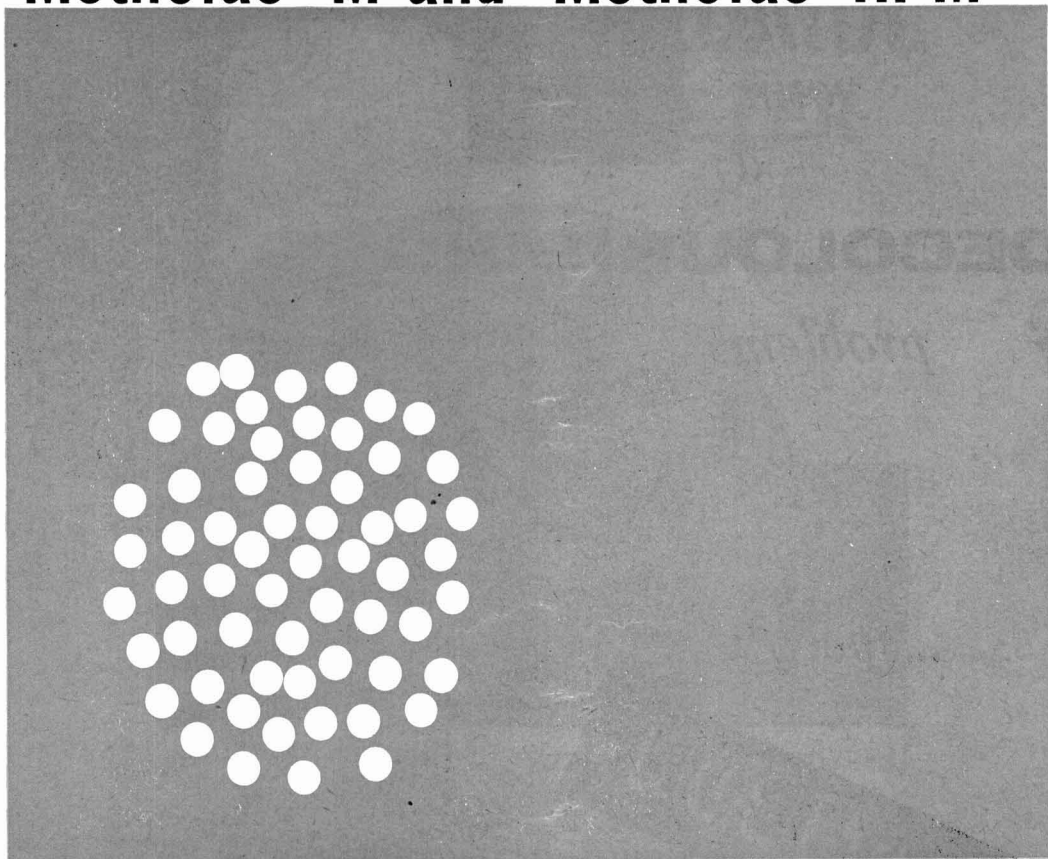
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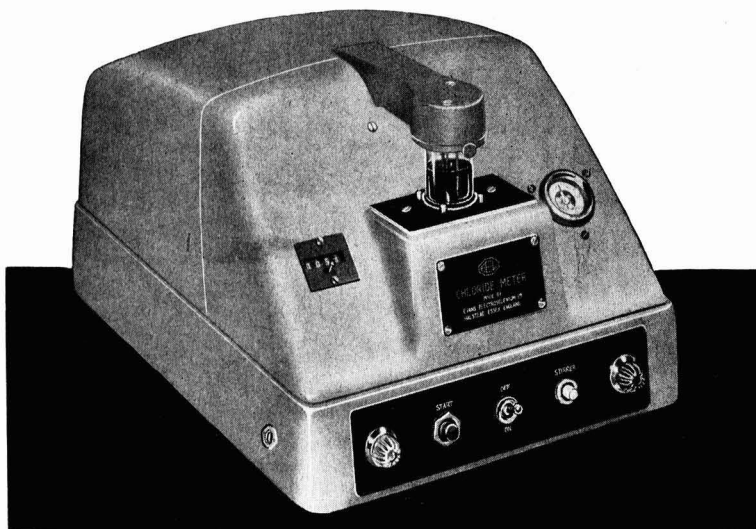
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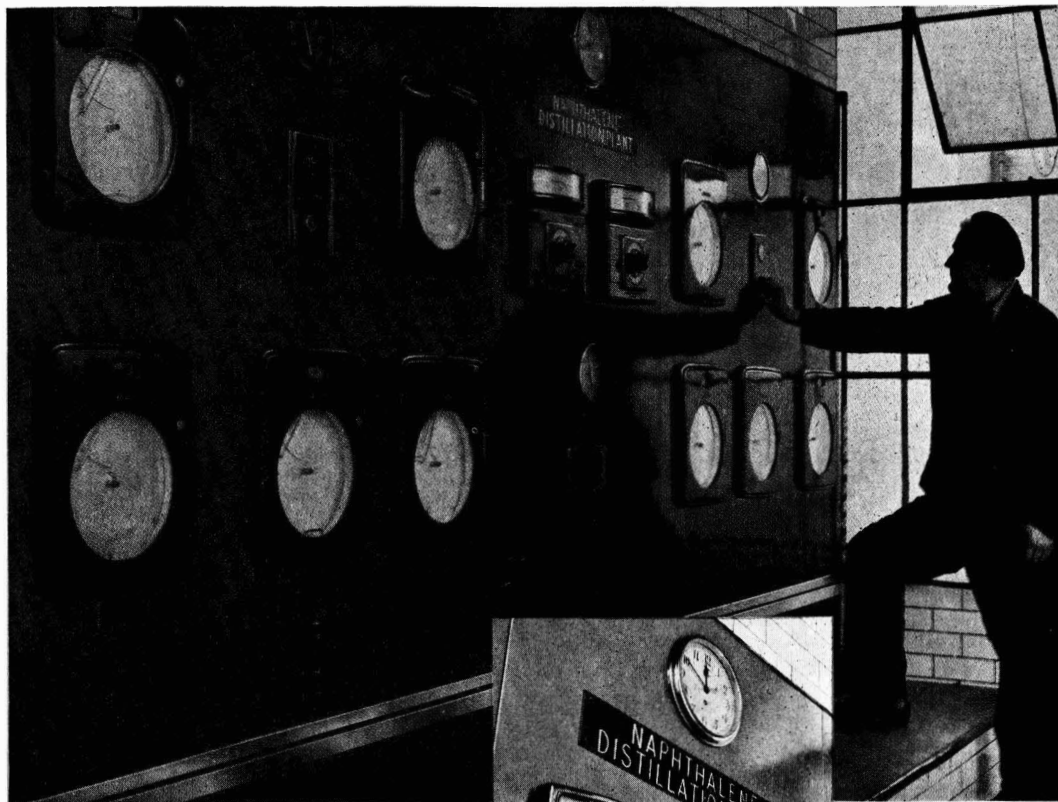
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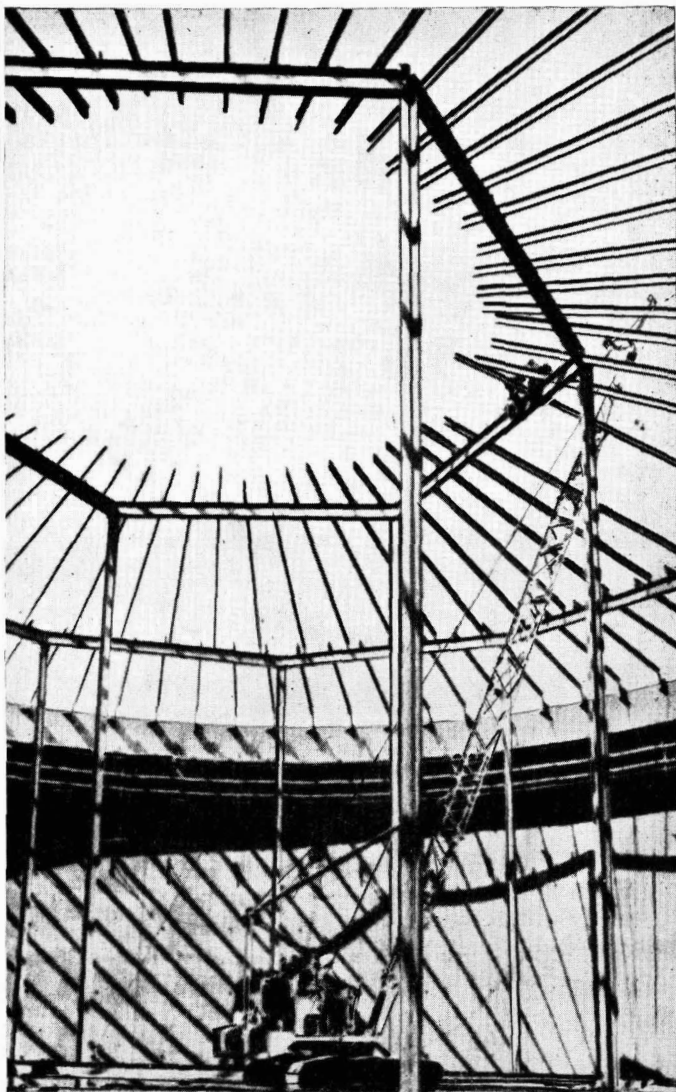
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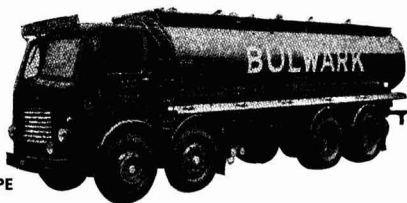
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BRNO TRADE FAIR

WITH something like 70 trade fairs in Europe jostling for attention, an addition to the circuit is often regarded as of nuisance value. In fact many so-called international trade fairs that have started up since the war have yet to command wide support.

It is therefore remarkable that an international fair, started only three years ago, and in East Europe, should now be regarded as having become one of the most important on the Continent. This is not the claim of the organisers, but the view of exhibitors and visitors alike. That the Brno International Trade Fair which this year expects to receive more than 30,000 foreign visitors has assumed a prominent position is largely due to the long-standing reputation of the Czech engineering industry, which had won international acclaim long before the last war.

The view of many British exhibitors, of whom there were more than 100 at the 1961 Brno Fair which closes on 24 September, is that from experience they expect to do more business at this Fair than at most others. So far as Britain is concerned, much of the interest in this exhibition lies in the fact that Czechoslovakia is currently providing chemical plants and refineries for the whole of Eastern Europe, particularly the Soviet Union. In addition, the country has a booming chemical industry, whose output is planned to rise nearly 100% by 1965, compared with 1960. To meet this programme, under which production of some products, notably plastics, fibres and fertilisers, is planned to rise by much more than 100%, calls for a 'crash' construction programme.

This is entailing the purchase of complete plants from Western countries; much of this business has come to Britain and more will probably do so. The only criteria in dealing in processes and plants are purely commercial—specification, quality, price, delivery rates, etc.

There is, of course, a two-way trade in chemical plant and many of the visitors to Brno in the past two weeks have been British chemical engineers looking at Czech plant and equipment. There is obviously a great deal of scope for increased trade between the two countries and it is confidently expected that 1961 will see previous levels exceeded.

Over the first half of the current year, Czech chemical production was higher by 16.3% than that for the first half of 1960. This was the highest rate of increase for any branch of industry. Plastics production is to be increased to 200,000 tonnes by 1965, or three times up on the 1960 figure and will represent a *per capita* output of around 15 kg./year.

Output of all artificial fibres, totalling 58,142 tonnes in 1959, is to be doubled by 1965, giving a *per capita* figure of around 7.5 kg./year.

Production of chemical plant and equipment in the first half of 1961 totalled only 82.2% of the planned figure and the erection of some plants is being delayed. This is doubtless partly due to heavy export commitments, and the situation should be eased when a new chemical engineering works is completed in Bohemia.

NEW B.P. CHEMICAL RESEARCH LABORATORIES AT SUNBURY

FIRST two laboratory buildings specially built for the Chemicals Division at the BP research centre, Sunbury, are now complete. An extensive range of special equipment is now being installed and the staff will begin moving in during the next few weeks. The new laboratories with their equipment will represent a total investment of about £500,000.

The No. 1 laboratory building has four storeys and a total floor area of about 38,000 sq. ft. In it are 24 individual laboratories, including three in which constant temperature can be maintained. An annexe to this building houses the high pressure laboratory which is a self-contained unit with three control rooms, six small laboratories and a workshop. The No. 2 laboratory building is specially designed for work on pilot plants and has been built to allow for future extensions.

All buildings are equipped with a full set of services, including town gas, hot and cold water, steam, compressed air and electricity. In addition, certain laboratory benches have piped supplies of hydrogen, nitrogen, oxygen and two hydrocarbon gases from large cylinder racks outside.

The Chemicals Division at Sunbury was set up in December 1958 to handle research on petroleum chemicals, a field in which the BP Group has growing

interests. Pending completion of its new laboratories, the Chemicals Division has been temporarily housed in other buildings at the research centre.

Tighter Drug Control Urged

INTRODUCTION of legislation for the adequate control of drugs was urged by Dr. D. C. Garratt (Boots Pure Drug Co. Ltd.), chairman of the Pharmaceutical Society at the Society's conference at Portsmouth. He suggested that provision for the control of drugs should be taken out of the Food and Drugs Act and incorporated in the new Medical Substances and Preparations Act built around sections 11, 12 and 13 of the Pharmacy and Medicines Act. Effective legislation should provide legal status for the standards of the B.P. and B.P.C.

Dr. Garratt added that control should also provide against the importation of inferior drugs by wholesale users for use in formulations where tests would not disclose the quality of drug used. To guard against such a contingency it should be laid down that an imported consignment of a drug must not be sold or used unless it carries a certificate of purity from a recognised laboratory in this country.

Staffs. Engineering Firm Sets Up Chemical Plant Department

THE Coseley, Staffs, engineering firm of Metal Formations have set up their own organisation to design, manufacture, install and commission gas and chemical plant in the small and medium size range. Hitherto, the company has concentrated on the production of oil refinery and chemical plant and their installation in conjunction with larger companies and internationally known consultants.

The company will concentrate initially on solvent recovery, trade effluent and gas drying equipment, with a possible further emphasis on the demand for small unit batch production processes in the pharmaceutical industry for drug manufacture, perfumes and essential oils.

The company commenced trading in 1938 in Gt. Brickkiln Street, Wolverhampton, moving to its present site in 1940. New shops and extension have been added progressively since that time and it is confidently expected will further increase by 20% during the current year. A subsidiary company, Watson Bros. (London) Ltd., was founded in 1956 to

handle sales in the London and South Eastern areas, and in 1957 a Plastics Division was formed. This now operates as Watson Industrial Plastics Ltd., with a factory in West Bromwich (Staffs) and produces epoxy, furane and polyester resin—glass fibre laminated fabrications for the chemical industry and will, of course, co-operate fully in the development of the chemical process side of the business.

Boake Roberts Cut Price of Triphenyl Phosphate

Taking effect from 15 September is a reduction in the price of triphenyl phosphate by £7/ton, announce A. Boake Roberts and Co. Ltd., London E.15. Lower raw material costs are stated to make this possible.

New prices are: for deliveries of 10 tons or more, £359/ton; 5 tons or more but less than 10 tons, £360/ton; 1 ton or more but less than 5 tons, £362/ton; 5 cwt.-1 ton, £365/ton; 1.5 cwt., £400/ton; 56 lb.-1 cwt., £410/ton.

Laporte to Raise £5 M. and Expand in Organics

A ONE-FOR-FIVE rights issue of 5,347,082 10s Ordinary shares has been announced by Laporte Industries Ltd.

Group profits for the first four months of the year are down and it is likely, say Laporte's, that profits for the year to 31 March 1962 will be "somewhat below" last year's £3,253,133. An ordinary dividend of 10½% is expected of which 3% will be paid as an interim on present capital. The final will be on increased capital.

The titanium dioxide plant extensions are well up to schedule, but will require considerable finance for completion. Among other capital expenditure, Howards had over £1.1 million planned for development over 15 months at the time of its recent acquisition.

It is intended to proceed not only with those plans, but also with further developments in the organic field of chemistry which will entail a "substantial increase" in the finance required.

Panama Refinery Could Give £10 m. Orders to U.K. Firms

ORDERS worth £10 million to British firms could be the outcome of a decision expected within the next two weeks from E.C.G.D. concerning the provision of an export guarantee for equipment for the new refinery which Ultramar is planning to build in Panama (see also p. 431).

The negotiations for financing the Panama refinery have reached an advanced stage but are subject to the necessary credit arrangements being made. Nevertheless, plans for the project, which includes a petrochemicals plant, are going ahead. Construction by the American McKee group has begun and the refinery is expected to come into operation by the end of the year.

The provision of British plant and equipment is being handled by the constructors' U.K. branch, McKee, Head and Wrightson and the credit facilities are being arranged by the Pan consortium. This was formed by Head Wrightson, Babcock and Wilcox and A.E.I. specially to handle the Panama project.

U.S. Firm to Sell I.C.I. Ammonia Synthesis Catalyst

UNDER agreement with I.C.I., Chemetron Corporation, Chicago, are to market the British company's ammonia synthesis catalyst, 35-4, on an exclusive basis in the U.S. Currently used in 40 converters at 17 synthetic ammonia plants in the U.K. and other countries, the catalyst is a granular triple-promoted iron oxide which speeds the reaction of nitrogen and hydrogen to form ammonia at 3,500 to 5,000 p.s.i. and at 750° to 1,000°F.

The agreement also covers marketing rights in other areas of the world; sales will be handled by the Chemical Products Division of Chemetron, which also markets Girdler catalysts.

Project News

Three Contracting Firms Study Sites for Big New Lurgi Plants

THREE contracting firms—Humphreys and Glasgow Ltd., Woodall-Duckham Construction Co. Ltd. and Constructors John Brown Ltd.—have been commissioned jointly by the Gas Council and the National Coal Board to take the first steps in the projection of what may become the U.K.'s largest Lurgi gasification plant. They will start by investigating possible sites, near collieries, in the East Midlands—Humgals at Desford, Leics; Woodall-Duckham at Newstead, Notts, and C.J.B. at Moor Green, Notts. A fourth site—Langwith, Derbyshire, is being held in reserve.

It is the contractors' task to prepare detailed designs for large-scale plants likely to use a million tons or more of coal a year. These designs are expected to be ready by the end of this year. The contractors are thus faced with a complex chemical engineering problem involving Lurgi plants on a scale not hitherto attempted in the U.K.

The Select Committee on the Nationalised Industries recently stressed the urgency of investigating the possibilities of Lurgi plants operating on a really large scale. It was estimated in 1959 that the capital cost of a Lurgi plant making 109 million cu. ft./day of gas would be £18 million. The recently opened plant at Westfield, Fife, for which Humgals were the main contractors, is being built at a cost of £6.6 million and, when the second stage is completed, will produce 30 million cu. ft./day.

U.K. Equipment for Panama Refinery

● U.K. FIRMS will supply most of the equipment for the refinery now under construction in the Republic of Panama, which includes a petrochemical plant, it was revealed in the annual review of Sir Edwin Herbert, chairman of Ultramar Ltd. The refinery, which will be operated by **Caracas Petroleum**—an operating subsidiary of Ultramar—is expected to be operating towards the end of 1962. This is a 55,000 bbl./day refinery and the total cost, including working capital is estimated at \$45 million.

Main contractors are Arthur McKee and detail engineering is to be carried out by **McKee Head Wrightson** of London.

Foster Wheeler to Build S. African Refinery

● CONTRACT for the design, engineering, procurement and construction of a 70,000 b.p.s.d. refinery to be built at Reunion Rocks, near Durban, South Africa, has been awarded to **Foster Wheeler Ltd.**, London.

This refinery will be constructed for

South African Petroleum Refineries (Pty) Ltd., in which a company of the Royal Dutch Shell Group of companies and British Petroleum Company Ltd. each have a 50% interest.

It is intended that the refinery will go on stream by 1 January 1964 and will consist of a crude distillation unit, a hydrodesulphurisation unit, a platformer (including stabiliser), amine treating facilities, a sulphur recovery unit, a sour water stripper, an L.P.G. stripper, and offsite facilities.

Fraser and Chalmers (SA) (Pty) Ltd. and O. Grinaker (Pty) Ltd. have been nominated to carry out site construction under the management of Foster Wheeler.

This contract represents the fifth complete refinery awarded to Foster Wheeler by international oil companies in the last four years.

Dutch Phenol Contract for Bechtel-Werkspoor

● CONTRACT for the erection in the Botlek area of Rotterdam of a phenol plant, has been awarded to **Bechtel International**, London, and **Werkspoor** of the Netherlands. The new plant will be operated by the U.S.-Dutch joint company, **N.V. Staatsmijnen-Dow Fenol**. Construction work will begin shortly and the plant is due on stream in 1962.

Whiffen's Maintenance and Welfare Block Completed

● FOLLOWING the progress report on **Whiffen and Sons'** £300,000 site development scheme in **CHEMICAL AGE** last week (p. 397) it has now been announced that construction of the maintenance engineering and welfare block has now been completed at a cost of £48,000. It was designed by Fisons' engineering section and built by William Moss and Sons, Loughborough.

I.C.I. Start Polypropylene Yarn Production

● PRODUCTION of Ulstron—their new high-tenacity polypropylene filament yarn—has been started by **I.C.I.** Wilton works. The first full-scale plant, with a capacity of 5 million lb./year, will start production at Wilton by the end of the year, and extensions will be built as required at the company's new site at Kilroot, in Northern Ireland.

Since August 1960, when they obtained from Montecatini of Italy the rights for the manufacture and sale in the U.K. of polypropylene fibres, I.C.I. have been carrying out development work on polypropylene filament yarns. The first com-

mercial uses of Ulstron yarn will be for fishnetting, twines and ropes. I.C.I. claim that the low price of the yarn (7s-8s/lb.), coupled with its low specific gravity, will result in considerable economies for marine uses over other synthetic fibres. It is expected that ropes made from the new yarn will be on the market early next year.

Ulstron mono-filament yarn is available in small quantities for market evaluation, and will eventually be used in similar outlets.

I.C.I.'s first polypropylene plant came on stream at Wilton in December last with 11,000 tons/year; construction is now under way to double this capacity. Main contractors are **Constructors John Brown Ltd.**

Czech Agency Negotiates on U.K. PVC Plant

● NEGOTIATIONS are in hand between **Polytechna**, the official Czech trading organisation concerned with the licensing of plant and know-how, on the purchase from the U.K. of complete plant for the production of p.v.c. Contract is expected to be completed by the end of the year. Polytechna would also like to licence a glass-fibre process based on British know-how.

Already this year, Czechoslovakia have obtained licences from **I.C.I.** to use the Terylene process and to market polyester fibre and for know-how for the construction of a 24,000 tons/year polythene plant. Design and engineering services for the polythene plant are being supplied by **Simon-Carves Ltd.** Both plants are being built in Bratislava at the 1-million tonnes/year Slovnaft Refinery which is nearing completion at Bratislava, the end of the crude-oil pipeline from the Soviet Union. This refinery is being constructed by the Czech engineering works of **Královopolská, Brno.**

F.W. Experts to Advise on Iraq Refinery Expansion

● THREE experts from **Foster Wheeler Ltd.**, London, have arrived in Iraq to advise on expansion of the Daura oil refinery, which the company built in 1957, according to a report from Baghdad. Iraq plans to increase the productive capacity of the £3.5 million refinery from 25,000 to 37,000 tons.

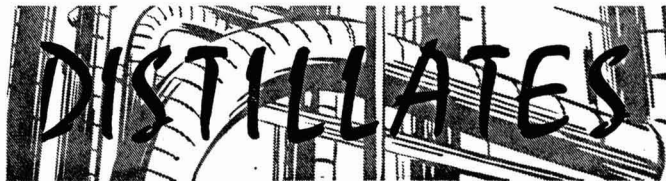
No comment on this report is at present forthcoming from Foster Wheeler's London headquarters. The company built Iraq's first lubricating oil plant and the Daura refinery was its second major contract there.

A.E.I. Electric Motors for BP Aromatics Plant

● ORDERS totalling £54,000 have been received by the **Associated Electrical Industries** for the supply of electric motors for us in a steel works extension scheme in Turkey and in the B.P. refinery in Kent.

Flameproof, high-speed electric motors worth £30,000 have been ordered for the

(Continued on page 437)



★ ODD thing about the arrangement whereby three well-known contracting firms—Humphreys and Glasgow, Woodall-Duckham and C.J.B.—have been started on the investigation of possible sites and designs for a big new Lurgi coal-gasification plant (see p. 431) is that no public announcement has been made by either the National Coal Board or the Gas Council, whose joint study group started the ball rolling, and no information is available to the Press. The only medium through which the news of this important chemical engineering effort has leaked out to the world at large is the September issue of the N.C.B.'s *Coal News*, while a passing reference to the subject was made by Sir Henry Jones, Gas Council chairman, in Edinburgh recently.

The only thing that seems clear is that there is no certainty that any of the contractors' reports—which are expected to be ready in six months—will lead to a contract for a big new Lurgi project. As I understand it from the recent report on the gas industry by the Select Committee on Nationalised Industries (CHEMICAL AGE, 26 August, p. 297) any schemes put forward will have to show that gas can be produced at a cost of less than 10d/therm, which, even at that, is at least 1½d/therm more than gas made from imported methane.

★ In this day of highly specialised knowledge, the development of new materials and processes is more often the outcome of team work rather than individual effort. This fact was borne out in the judgement given recently by the Assistant Comptroller of the Patent Office regarding a claim to half share of any benefits ensuing from a new drug.

The claim was made by Dr. H. Burton who was concerned together with five others in the invention of Cephalosporin, a type of penicillin. In rejecting the claim, Mr. E. Tollerfield, Assistant Comptroller, said that he had come to the conclusion that Dr. Burton's contribution was neither so fundamental nor of such outstanding merit as to justify the half share he claimed. The fact that one member of a team was fortunate enough to be allotted a line of investigation which led eventually to an important discovery ought not to entitle him to a bigger share.

In the patent (No. 745 208) Sir Howard Florey, President of the Royal Society, who was in charge of Sir William Dunn School of Pathology in Oxford, where Dr. Burton was employed, is named as the inventor. Three of the other scientists are employed directly by the Medical Research Council and are therefore not, by contract of employment, entitled to

benefit further.

At the enquiry in July, Sir Howard Florey and the five scientists had requested the comptroller to direct Dr. Burton to join them in executing the requisite agreements assigning the patent to The National Research Development Corporation. This the comptroller had done.

★ BECAUSE the hurricane Carla struck the Texas Gulf coast about 125 miles south east of Houston, and away from its expected contact point, most of the large chemical plants escaped damage. Most plants had shut down in advance and employees had been among the thousands who trekked inland to avoid the hurricane.

Most damage was caused by flooding and, according to *Chemical and Engineering News*, one of Dow Chemical's plants at Freeport was flooded to a depth of 10 feet by sea water. The Ethyl-Dow and the U.S. Government's new saline water distillation plant were also flooded there. Plants along the Houston Ship Canal were flooded.

Many facilities in the Houston area and at Port Arthur and Beaumont began start-up operations late on 12 September, the day following the hurricane. Plants in Freeport and Texas City had later start-ups due to damage by wind to power lines.

★ A SURVEY of the U.K. chemical industry's attitude to the probability of Britain's joining the Common Market, published in *The Guardian* of 13 and 14 September, reveals no more than has already been made evident: that the larger chemical firms are not worried about their prospects in the Common Market and even welcome it as a means of expanding business. However, the survey is useful because it does reveal some of the doubts and fears that assail even some of the most optimistic.

Thus, quoted as a typical opinion is: "The price of organic solvents may drop about 5%, with a small increase in exports; and there may be a considerable fall (about 10-15%) in the prices of ethylene and propylene oxide and their derivatives. There ought to be a possibility of a 10% increase in exports of these latter materials." Polyolefins and polystyrene are cited as further examples of products which are likely to suffer price cuts of 7-8%.

On fertilisers, it was concluded that the more efficient manufacturers ought to be able to withstand Common Market conditions, provided "there are some useful anti-dumping arrangements". An

earlier part of the survey had shown that in some other fields of chemical manufacture, at any rate, there were no fears about dumping, for it was pointed out that dumping would become obsolete since 'dumped' material could be bought up by the producers in the receiving country and returned to the market from which it came.

★ VISITING a country for a first time is always a fascinating experience. When the people are as warm and friendly as the Czechs, the first-time visitor will find it hard to make an objective assessment of what he sees. Outstanding impression of my visit to the Brno Fair last week was not of an 'Iron Curtain' country, but one in which people are eager to discuss East-West relations in a critical way, aware of shortcomings in their own regime, yet proud of their achievements.

The Brno Fair is one of these, having rapidly shot to the forefront. Like all successful international trade exhibitions it is far too big, but it is organised in such a way that the visitor can see most of what he wants to in one or two of the many pavilions.

Already of great interest to the foreign chemical engineer, Brno is likely to attract even more visitors next year. Then a congress covering all aspects of chemical engineering will be staged. More than 2,500 individual invitations have gone to over 50 countries. To be staged by East Europe's biggest chemical engineering works—Krávopolská in co-operation with the Ministry of Chemical Industry—it will be a Czechoslovakian 'Achema'. But not, I hope, as big.

★ ONE of the biggest fairs in Europe, and certainly the biggest in Eastern Europe is the Leipzig Fair. I.C.I. Dyestuffs Division, when I visited them at Brno last week, told me that at the Leipzig Spring Fair in May, contracts worth £150,000 were signed with East Germany. This was higher than the figure for the 1960 Spring Fair.

The division, who have already done considerable business with East Germany over the past three years in dyestuffs, pigments and rubber chemicals believe they are working in an expanding market that offers considerable prospects. East Germany's big interest in dyestuffs stems from the fact that producers in that country concentrate on acid dyestuffs and direct cotton dyestuffs, a section in which the division does not compete.

I.C.I. Dyestuffs Division have shown at Leipzig Fairs since the 1958 Spring Fair; other divisions, notably plastics and heavy organic chemicals, now also show at the Spring Fair. From their satisfactory initial experience at Brno, I expect that Dyestuffs Division will be followed by other I.C.I. divisions for the next year's fair.

Alembic

BRNO INTERNATIONAL TRADE FAIR

I.C.I. Dyestuffs Division Show for First Time in Czechoslovakia

EVIDENCE that the Brno International Trade Fair has now joined the ranks of the world's leading industrial exhibitions comes from the growing participation on the part of the western chemical and chemical plant manufacturers, writes a CHEMICAL AGE staff correspondent who last week visited Brno. For the first time I.C.I. are showing at Brno, joining such companies as Bayer and B.A.S.F. of West Germany and Montecatini of Italy.

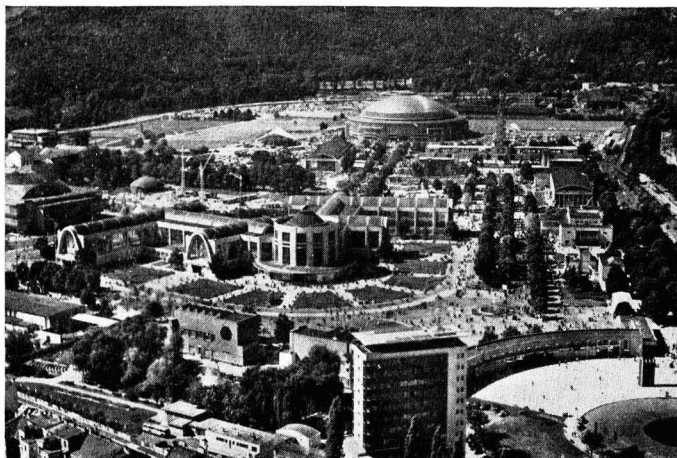
Humphreys and Glasgow Ltd. and Petrocarbon Developments Ltd. took part, showing the interest that the British chemical contractors are taking in Eastern European markets, and they were joined by a number of U.K. equipment producers. Notable in this section were Lurgi of West Germany, showing at Brno for the third time, Niro Atomiser of Denmark, also at Brno for the third year in succession, Degussa of Germany, N.V. Leidsche Apparatenfabriek of Holland, Chemap of Switzerland, and Baker Perkins, the Holman Group and Manesty Machines of the U.K.

High Standard of Engineering Exhibits

The standard of engineering and chemical plant exhibits was exceptionally high, for overseas companies had to show their products against the range of specialised equipment offered by the Czechoslovakian engineering industry, one of the world's most important and with a reputation for quality.

For the first time since the Brno Fair joined the ranks of international trade exhibitions three years ago, exhibits were grouped by industries and not by international pavilions. Chemical plant and engineering were featured in the latest and most spectacular pavilion at Brno—Pavilion Z, which with its vast, towering dome, unsupported by columns, dominates the exhibition site.

This fair, set in the natural beauty of the surrounding Moravian countryside, has in the three years of its 'international' existence, become one of the most important. The first fair in 1959 attracted 13,500 foreign guests from 44 different countries; last year the figure rose to 22,400 visitors from 67 countries; this year, the figure is expected to top the 30,000 mark.



General view of the third Brno International Trade Fair held in the South Moravian area of Czechoslovakia

The exhibition was opened by Mr. Vilian Siroky, Premier of Czechoslovakia, on 10 September and continues until 24 September. The Premier stressed his country's increasing trade with western countries. Investments in the third Five-year Plan (1960-65) will total 322,000 million Crowns (or \$45,000 million), with chemicals production set a target increase of 97% in that period. Big production increases are slated for plastics (to reach 190,000 tonnes), synthetic fibres (105,000 tonnes) and nitrogen fertilisers. This investment programme will make chemicals second only to engineering in industrial importance in Czechoslovakia.

Foreign Trade Minister, Fr. Krajčír, states that already his country's steel production represents 496 kg. per head of population, or more than in Britain or France and that *per capita* production of electric power is higher than in Belgium or France. By 1965, plastics production should total 15 kg. per head of population, with 7 kg. for synthetic fibres.

At the Brno International Trade Fair held last year, Czech foreign trade corporations concluded trade deals worth

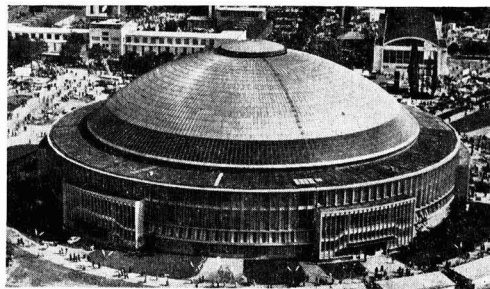
nearly 6,000 million Crowns, or more than one-fifth of the volume of the country's overseas trade last year. At the 1961 Fair, this figure was expected to be exceeded, although the total figure will not be known for some time.

Great Britain was officially represented at the Fair in the Pavilion of Nations through the Board of Trade. This exhibit did not compare favourably with those of other nations and when CHEMICAL AGE visited the stand the only literature then available was printed in English.

The 1961 Fair was accompanied by four international symposia, held in Prague, one of which dealt with steel and alloys for the chemical industry. For the 1962 Fair, an international conference will be held on 'Chemical plant, engineering and automation'. This will take place at Brno a week before the Fair and already more than 2,500 invitations have been sent to chemical engineers in 50 countries. This will it is felt greatly heighten interest in the chemical engineering and equipment section of the Fair. Full details of this conference will be published in a future issue of CHEMICAL AGE.



Inside the high-domed Pavilion Z where chemical plant and equipment is featured



Pavilion Z, latest and most spectacular addition to the Brno Fair exhibition buildings

Chemical Plant and Equipment is Big Feature at Brno Fair

LARGEST stand in the chemical plant section of the Brno International Trade Fair was that of **Technoexport**, the foreign trade corporation for the export of complete industrial plants.

Pride of place was given to models showing sections of a large 1 million tonnes/year oil refinery exported against strong international competition to Homs, Syria, U.A.R. This has now been on stream for about a year and the contract, carried out by Královopolská, covered design, engineering, procurement, construction and commissioning. Since this refinery came on stream, fuel consumption has been cut by 6%, electricity consumption by 4% and cooling water by 34%.

The Královopolská Chemical Engineering Works of Brno are now nearing completion on another 1 million tonnes/year refinery at Bratislava. They have since 1924 carried out large-scale engineering work at refineries throughout the world and are currently working on a number of complete chemical plants in Czechoslovakia and other East European countries.

Film shows depicting construction of the Homs refinery were shown with commentaries in English and other languages at the Fair.

Recent petroleum industry contracts have covered lube oils, atmospheric-vacuum distillation, propane deasphalting, solvent refining, solvent dewaxing, thermal cracking, thermal reforming, catalytic dehydrogenation, catalytic polymerisation, LPG recovery, etc.; English literature describing these processes is available from Technoexport of Prague.

Among exhibits on the Technoexport stand, was a welded high-pressure CO scrubber made by a new method developed by Královopolská for which a patent is being sought. Also featured was an ammonia reactor with an output of 200 tonnes/day, rising to 250 tonnes depending on catalyst activity and the degree of synthesis gas purity. Working pressure is 325 atm, with a top operating temperature of 560°C.

Newly developed plant included a low-temperature heat exchanger for the separation of pyrolysis gases in the production of ethylene. Also shown was a rotary extraction column.

Strojexport, the Czech foreign trade agency for exports of machinery showed a wide range of valves, gauges, level indicators, pumps, compressors, etc., while **Omnia** featured laboratory instruments and equipment.

Glassexport, who are represented in the U.K. by Smith's Glassware and China Ltd., London, for sales of laboratory ware have recently signed contracts for the export of larger items of chemical glassware and pipelines. Czech scientific glassware was first sold to Britain in 1846.

One of the main features of the display included a range of vacuum circulatory evaporators made in Simax borosilicate glass for which a low coefficient of linear expansion and high thermal resistance (maximum working temperature is 200°C), plus good chemical resistance are claimed. This equipment is produced in four sizes with outputs ranging from two to 20 litres/hour. There are two main parts to the smaller equipment; circulation system with heat transfer and cooling with a solvent condenser. Also shown were reaction vessels and suspension kettles which can be supplied with all-glass stirrers, glass heating coils or electric heating jackets.

Attracting much interest at Brno were electric water-stills of 4, 10 and 30 litres/hour capacity, while a deionisation installation shown produced low salt content deionised water similar in quality to distilled water. One of the more spectacular exhibits was distillation apparatus of up to 100 litres/hour for steam heating.

The Czech State chemicals import and export organisation **Chemapol** are shortly to appoint their own U.K. representatives for the first time. The firm concerned will be Exico Ltd., who have recently moved to Exico House, 34-36 Grav's Inn Road, London, W.C.1.

Chemapol's exports to the U.K. are increasing and are based largely on the derivatives of brown coal. Exports to the U.K. include motor benzole, citric acid and, from time to time, calcium carbide. Bigger customers for Chemapol are West Germany.

On the import side, this State corporation buys considerable quantities of organics and plastics materials. Currently Czechoslovakia is buying far more from

this country than she is exporting to the U.K. Although exports go to nearly 50 countries, more than 60% of total exports are sent to East European destinations.

Chemapol have a wide range of chemicals for export, which will increase as new plants come on stream under the country's Third Five-year Plan.

To help meet the 1965 target of a 97% rise on 1960 chemical production rates, Czechoslovakia is having to buy processes and in some cases complete plants. The specialised organisation dealing in such transactions is **Polytechna**, who have this year purchased know-how from I.C.I. for a polythene plant and who are now negotiating a p.v.c. plant purchase in the U.K. Other licences have been purchased in Italy (Fausser-Montecatini ammonia process) and West Germany (B.A.S.F. hydrogen plant). Currently Polytechna are seeking a glass fibre process and will purchase other process licences and complete plants as the need arises.

The only British chemical producers showing at Brno were **Imperial Chemical Industries Ltd.** and their stand in the Textile section was confined to Dyestuffs Division. This division was quite satisfied with the early results of their exhibit and had received many enquiries; it is likely that as at other trade fairs, Dyestuffs Division's initial showing will be followed by other divisions. It is also felt probable that the holding of a full scale chemical engineering congress at the 1962 Fair will attract other U.K. chemical producers as exhibitors.

100 British Exhibitors

Among the 550 exhibitors—53 up on 1960—there were over 100 British firms, more than from any single country. Among them were Audeco Ltd., Baker Perkins (Exports) Ltd., Birwelco Ltd., B.I.P. Engineering Ltd., Cambridge Instrument Co. Ltd., Dawe Instruments Ltd., Electronic Instruments Ltd., Evershed and Vignoles Ltd., Exico Ltd., Goodyear Pumps Ltd., Guest Keen and Nettlefolds Ltd., Heenan and Froude Ltd., Hilger and Watts Ltd., Holman Brothers Ltd., Humphreys and Glasgow Ltd., Manesty Machines Ltd., Morgan Crucible Ltd., Petrocarbon Developments Ltd., W. G. Pye and Co. Ltd., Solatron Electronic Group Ltd., Unicam Instruments Ltd., and Wogau Machinery Ltd.

Consensus of opinion among British exhibitors as well as those from other West European countries was that the Brno International Trade Fair had in a very short time become one of the most important exhibitions in Europe so far as the chemical and chemical engineering industries are concerned. While it was admitted that for some companies large contracts were usually signed during the year, and not necessarily at the fair, they expected to book a considerable volume of orders at Brno as well as to maintain contacts with Czech trading organisations and those of other East European countries.

Most exhibitors were particularly pleased with the prompt and efficient administration of the Fair, and all of those visited intend to return to Brno in the autumn of 1962.

ACS National Meeting

'PROFESSIONALISM' BEST TAUGHT BY EXAMPLE, SAYS PRESIDENT

THE 140th National Meeting of the American Chemical Society held in Chicago has included the usual variety of papers in many fields of chemistry, including those of the biological chemistries, the treatment of waste materials, and economics as well as the usual fields of inorganic, organic and physical chemistry.

In his presidential address, Dr. Arthur C. Cope, Head of the Department of Chemistry at the Massachusetts Institute of Technology, discussed professional training in chemistry. There is considerable divergence of opinion among members of the American Chemical Society about the significance of 'professionalism'. Many hold that students, both undergraduate and graduate, should learn to conduct themselves as professionals through attaining the highest possible degree of competence in chemistry, but there is also a sizeable group that believes 'professionalism' can be taught through classes. Dr. Cope holds the opinion that in most instances university faculties do well to concentrate on instructing their students in the subject matter of science and the objective and methods of research. Teaching proper professional conduct by example on the part of the university faculty, Dr. Cope believes, is the surest way of producing the desired result.

Among the new processes reported at the American Chemical Society Meeting is a new route to **Grignard reagents** developed by workers of the General Electric Co. The method involves the exchange of an olefin for the alkyl group in a Grignard reagent in the presence of titanium tetrachloride to form a new Grignard derived from the added olefin. Yields are comparable with those obtained by the conventional method of preparation.

The mechanism suggested by the General Electric workers is that an alkyl titanium compound is formed followed by the elimination of titanium hydride to form an olefin, the addition of titanium hydride to the olefin and an exchange of the new alkyltitanium compound with the Grignard reagent.

Exchange reactions have been tried with a number of olefins followed by typical Grignard reactions, and products were obtained in 20 to 62% yields. These results, however, are probably not the maximum possible.

A mixture of titanium tetrachloride and a Grignard reaction has been described as a Ziegler polymerisation catalyst, but little or no polymerisation occurs under the conditions used. It is believed that this is because the reaction is carried out in ether rather than a hydrocarbon

An advantage of this method of synthesizing Grignards is that it can use a relatively inexpensive alkylhalide (to make the original Grignard reagent) with an olefin that may be more available than the corresponding alkylhalide.

Another new synthesis, that of disilylalkanes, disilylalkenes, silacyclopentanes and silacyclopentenes, has been developed by three workers of Dow Corning.

The synthesis was developed as part of a continuing effort to find new ways of forming **carbon-silicon** bonds. Compounds having such bonds can be easily incorporated into polymeric materials.

Of the various methods of making organosilicon compounds, the two most usual ones are the use of Grignard reagent made from a dihaloalkane, and the addition of C-Si bonds to an olefin. In the new method, aryl olefins such as styrene and conjugated dienes such as butadiene react with an alkali metal in the presence of a chlorosilane to give the required product in 40 to 80% yield.

It is felt that the new synthesis offers several advantages over the established methods. It gives a direct one-step route to disilyl compounds otherwise difficult or impossible to form and the reaction takes place rapidly at room temperature in readily available solvents.

A new series of **carbon-boron** com-

pounds—carboranes—has been prepared by Dr. R. E. Williams, of National Engineering Science Co., Dr. L. Shapiro, of Hughes Tool Co., and Dr. C. D. Good, of Aerojet General. The work was carried out from 1955 to 1958 when all three were employed by Olin Mathieson.

The carboranes are a series of compounds corresponding to the empirical formula $B_nC_nH_{n+2}$. They were produced by the reaction of pentaborane-9 with acetylene in a silent discharge tube. The lowest member of the series, $B_2C_2H_4$, is a gas, boiling at -4°C . Other compounds which have been prepared are symmetrical and unsymmetrical $B_3C_3H_6$ and $B_4C_4H_8$. The unusual stability of these compounds suggests that they might provide a suitable means of introducing nontoxic boron into animals.

These new compounds seem to be related to aromatics except that they are electron deficient, and they differ from boron hydrides, alkylboron hydrides and their derivatives in that they have no bridge hydrogens. On the basis of nuclear magnetic resonance and mass spectra, the scientists conclude that the most likely structure for $B_3C_3H_6$ is a trigonal bipyramid.

A modification of the Ziegler process for the production of α -olefins has been developed by Procter and Gamble, Cincinnati. The process consists of basically five steps: the build-up of ethylene on aluminium triethyl; the displacement of olefins from the resulting aluminium alkyls together with the regeneration of aluminium triethyl; separation of the desired C_{12} to C_{18} cut olefins; reaction of the C_6 to C_{12} olefins with aluminium triethyl; and the recycle of aluminium C_6 to C_{10} alkyl for additional build up to the desired C_{12} to C_{18} chain length.

Homopolymerisation of Maleic Anhydride, Cheaper Urethanes, Quicker Analysis

ALTHOUGH scientists have worked for some time on the homopolymerisation of **maleic anhydride**, they have until now only succeeded in producing either compounds of low molecular weight or cyclic compounds. Now, however, by using the radiation from cobalt-60 as the initiator of the reaction, three workers have succeeded in producing a high molecular weight compound polymer (23.1×10^5) for the poly(maleic acid). They are L. Lang, Koppers research Centre, W. A. Pavelich, Spencer Research Centre and H. D. Clarey, Dow Chemical polymer research laboratory.

The process was carried out by irradiating with gamma rays from a cobalt-60 source a 10% solution (by weight) of monomer in acetic anhydride at a rate of 0.195 megarad per hr. The total dose was 43 megarads. The resulting compound was poly(maleic anhydride) with an intrinsic viscosity of 0.052 dl. per g. in methyl ethyl ketone. When a 50% solution was irradiated at the same rate the intrinsic viscosity was 0.112 dl. per g. Irradiating undiluted

monomer at a rate of 0.206 megarad per hr. for 99.7 hr. and at 75°C changed 14% of the monomer into polymer. A 50% solution under the same conditions resulted in the conversion of 56% of the monomer. The research team concluded that molten monomer produces polymer having a higher molecular weight than that produced from solutions of monomer in acetic acid.

The exact initiator mechanism is not known, but evidence obtained from experiments using benzoyl peroxide as an initiator and from ultraviolet light-diacetyl free radical initiator supports either the free radical or the ionic mechanism.

Infra-red absorption curves of poly(maleic anhydride) show the expected characteristic adsorption bands plus those of a trace amount of poly(maleic acid). Neither the poly(maleic anhydride) or the poly(maleic acid) shows evidence of crystallinity when examined by X-ray diffraction.

Chemists of Mobay Chemical Co. believe that the cost of rigid **urethane**

foams could be substantially reduced by using crude tall oil as the raw material. Mobay are making development quantities of rigid foams containing up to 38% by weight of crude tall oil using standard processing equipment.

These foams are as yet far from commercial production but if they could be made on a commercial scale the raw material cost of the foam could be reduced to 35 to 45 cents a lb. compared to the 45 to 60 cents a lb. for present rigid urethane foam.

The function of the tall oil is to reduce the amount of polyols needed. The most successful crude tall oil tested so far is a synthetic crude, Ental 672-65, made by Emery Industries. The polyether polyol used was *N,N,N',N'*-tetrakis (2-hydroxypropyl)-ethylene-diamine, the diisocyanate was a crude form of 4,4'-diphenylmethane diisocyanate and the blowing agent was trichloromonofluoromethane. Foams made from these raw materials have good dimensional stability and 85 to 95% closed cells, giving them low thermal conductivity. Because of this last factor, Mobay believe that the foams could be used as insulating materials.

Attempts to substitute toluene diisocyanate were unsuccessful since they produce foams that were dimensionally unstable and the use of conventional polyether polyols containing no tertiary nitrogen resulted in foams with open instead of closed cells.

The analysis of polymers was the subject of a paper by W. C. Taylor and Dr. L. H. Tung of Dow Chemical's polychemicals research department. They

have worked out a method for the analysis of polythene which is believed to be readily adaptable to other polyolefins, and which takes two hours instead of the two or three days needed for the fractional precipitation procedure now used.

The method used is a turbidimetric method in which the polymer is dissolved in a solvent and then precipitated, either by lowering the temperature or by adding a nonsolvent material. The polymer precipitates in relation to its molecular weight and solubility. From the amount of polymer precipitated, the molecular weight distribution can be determined.

Turbidimetric methods have been used to determine the molecular weight distribution of cellulose esters, polymethyl methacrylate and other polymers. However, the insolubility of polyolefins has made it necessary to carry out the tests on these polymers at high temperatures.

The difficulty with precipitating polythene is that agglomeration occurs making turbidity highly irregular. Stirring only increases the effect. To prevent the formation of an agglomerate, the Dow workers used the dropped temperature technique to cause precipitation rather than the addition of a nonsolvent. To eliminate agglomeration completely, a special glass partitioned sample cell which discourages convection was designed.

The solvent used in the tests was γ -chloronaphthalene with 30% by weight dimethylphthalate. The precipitate was stabilised by the addition of 0.5% ethyl cellulose. Under these conditions, very uniform and evenly distributed turbidity was produced.

Improved Method of Low-level Carbonate Determination by Gas Chromatography

A SIMPLE and rapid gas phase chromatographic procedure for the determination of carbonate at low levels has been developed by the U.S. National Bureau of Standards. This method, which involves the evolution of carbon dioxide with acid, is one which is normally used to determine the carbonate content of solids or liquids. It has a detection limit of 0.2 p.p.m. and an uncertainty of less than 1%.

In the procedure the solutions of known volume or samples of known weight are placed in a 125-ml. flask which is attached to the analytical apparatus. The flask is swept by CO₂-free nitrogen and evacuated to $\frac{1}{2}$ atm. Ten ml. of 3N HCl are drawn into the flask, and the mixture is stirred vigorously with a magnetic stirrer for five minutes. A 10 ml.-portion of the gas is withdrawn for analysis.

This gas sample is swept with helium to the chromatographic column, passing first through a small tube of magnesium perchlorate to remove water vapour. The water-free gas then passes through a 30 cm.-column packed with silica gel at a flow rate of 4 cm./s. The gases leaving the separating column are analysed with a thermal conductivity detector, the out-

put of which is recorded on a strip chart. Analyses made with this system can be completed in 10 minutes or less.

The apparatus must be calibrated with pure CO₂ before use, as the technique does not provide an absolute measure of carbonate content. At the Bureau the method was checked by a analysis of both N.B.S. Standard Limestone and a standard solution of sodium carbonate. Good agreement was obtained in each case.

Using standard gravimetric techniques, and retaining a reasonable sample size, amounts of carbonate below 10 p.p.m. are difficult to measure without sacrificing speed and ease of manipulation. The use of gas chromatography for measurement of carbon dioxide has made it possible to extend the rapid analysis of carbonate to another order of magnitude.

Chinese Coal Industry

Latest in the statistical reviews of Communist-bloc countries published by Joseph Crosfield and Sons Ltd., Warrington, is Part 1 of a series on the 'Chinese Coal Industry'. Part 1 deals with the economics of the industry, organisation and geographical distribution.

Farm Chemicals Study Should be Financed by Industry, says Pathologist

SPEAKING at the British Association Veterinary Congress, Mr. A. R. Jennings, lecturer in animal pathology at the Cambridge School of Veterinary Medicine, said that manufacturers of poisonous farm chemicals should spend some of the money they now allocate to advertising to investigate the long-term effects of these substances on human beings.

Mr. Jennings reminded delegates that these chemicals are cumulative poisons. Legislation in Britain lags far behind other countries and there are no standards laying down the maximum quantities that should be in tissues. "We know very little about the effects of these chemicals", he said.

Paper on Styrene Monomer Production

FIRST 1961-62 meeting of the S.C.I. Heavy Organic Chemicals Group will be held at 14 Belgrave Square, London S.W.1, at 6 p.m. on 6 October, when Mr. J. N. Hornbrook (Monsanto Chemicals Ltd.) will give a paper on 'Styrene monomer manufacture'.

Mr. Hornbrook will deal with the most important styrene process—synthesis of ethylbenzene from ethylene and the subsequent catalytic dehydrogenation of ethylbenzene. This is a four step process:

1. Alkylation of ethylene and benzene to form ethylbenzene using a Friedel-Crafts type reaction with an aluminium chloride catalyst.
2. Distillation of ethylbenzene.
3. Catalytic dehydrogenation of ethylbenzene at 600°C in the presence of steam.
4. Purification of styrene by vacuum distillation.

This route gives overall yields of more than 90% from ethylene and benzene to finished styrene at 95% on-stream time.

No tickets are required for this meeting, at which non-members will be welcome.

Chemical Evening Courses at Sir John Cass

Among courses of weekly evening lectures to be held at the Sir John Cass College, Jewry Street, Aldgate, London E.C.3, are a number of interest to chemical engineers, chemists and industrial executives. They include 'Distillation', by G. A. Dummett, M.A., M.I.Chem.E., commencing 19 January 1962; 'Spectrochemical analysis', by F. W. J. Garton, B.Sc.(Lond.), A.Inst.P., F.R.I.C., commencing 27 September 1961; 'Absorption spectroscopy', by A. R. Philpotts, M.A. (Cantab.); 'Radiochemistry and radioactivity', by A. G. Maddock, Sc.D. (Cantab.), Ph.D.(Lond.), D.I.C.

Other courses deal with statistical methods in scientific and industrial research, mathematics, physics, fuel technology, industrial law, trade marks, patents and other subjects.

Project News

(Continued from page 431)

new B.P.-California aromatics plant nearing completion at the British Petroleum Co.'s refinery in Kent.

The Turkish order is for a.c. and d.c. motors to the value of £24,000 for Bursa Biraderler of Istanbul. They are to form part of the extension scheme at Karabuk Steelworks.

Film Extensions for British Cellophane

● THE works of **British Cellophane Ltd.** in Barrow-in-Furness is to be extended by over 190,000 sq. ft. to cope with increased demand for packaging film, etc.

Progress at B.P. Antwerp Refinery

● AT the Antwerp refinery of **Soc. Industrielle Belge des Petroles**, where an expansion project is in hand to double capacity from the current 4 million tonnes/year, foundation work has been completed for a 10,000 b.p.s.d. distillation unit, a 9,000 b.p.s.d. catalytic reformer and a second gas oil hydrofiner of 10,000 b.p.s.d. Work is advanced on new storage tanks and the whole project is due for commissioning by late-1962.

The Belgium operating company is owned jointly by British Petroleum and Petrofina.

Quickfit Lab. Glassware for Mexico

ORDER for 320 laboratory assemblages, worth over £2,200, has been received from the University of Mexico by **Quickfit and Quartz Ltd.**, Stone, Staffs, manufacturers of scientific glassware. Nearly 5,000 pieces of apparatus are involved in the order.

This is the third order from the university obtained by Q. and Q. The first two, in 1959 and 1960, were for a total of 1,040 sets of laboratory apparatus.

I.C.I. Beryllium Men Strike Over Cut Bonus

A strike occurred on Tuesday at the I.C.I. beryllium plant at Witton over a reduction in bonus of one of the workers. About half the men came out. The management say that the worker had been warned about his performance and that the matter was under discussion with his union, the Transport and General Workers Union.

D.S.I.R. Moves London Head Office

The Department of Scientific and Industrial Research is now installed at its new headquarters—State House, High Holborn, London W.C.1 (Chancery 1262). State House is a new 15-storey block about three minutes' walk from Holborn underground station on the north side of High Holborn.

Outstanding Corrosion Resistance Claimed for I.C.I.'s New Phosphate Coating Process

A PHOSPHATING process which is non-aqueous, dispenses with rinsing and tank-heating, forms no sludge in the processing tank and produces a sealed phosphate coating has been developed and introduced by the Paints Division of I.C.I. The phosphate coating is said to enhance paint adhesion and resistance to rust creep in the same way as conventionally produced zinc or iron phosphate coatings. It is claimed that improvement in the corrosion resistance of paint systems is quite outstanding and that the possibility of work being contaminated by water-borne impurities is eliminated.

The coating, called Kephos, contains a sealer which is sufficiently corrosion resistant to protect work during transport or temporary exterior storage for up to a week, or indoor storage up to six months. Under normal production conditions, work can be welded through the Kephos film. This enables items to be treated before fabrication, so that shrouded areas such as interior box sections receive some protection.

Kephos is not confined to dipping, but may be applied by brush, roller, spray or flow-coating. It can be used to supplement existing phosphating facilities when an article is too large for the plant or an abnormal volume of work requires processing.

For regular use, according to I.C.I. the higher chemical cost of the process is offset by the compactness and simplicity of plant requirements and the saving in heating and plant maintenance costs, par-



On large metal structures, such as this air duct of A. Reyrolle and Co. Ltd., Kephos is simple to apply by brush

ticularly for the manufacturer of a small volume of high quality production. The ideal system is to degrease all work on arrival and apply 'Kephos' before it is put in store; it is thus simultaneously protected and phosphated during storage and subsequent assembly, requiring only the removal of surface dirt to prepare it for painting.

Obituary

Professor Ulrich Haberland

PROF. ULRICH HABERLAND, chairman of Farbenfabriken Bayer A.G., died suddenly of a heart attack at his country home at Antweiler. He was 60 years old.

Professor Haberland studied chemistry at the University of Halle where he gained his Dr. Phil. in 1924. In 1928, he joined the Uerdingen works of the then I.G. Farbenindustrie A.G. to carry out research and development work and at the age of 37 he became a director and manager of the Uerdingen works. In 1943 he took over the management of the Leverkusen works and shortly afterwards the general management of the four factories at Leverkusen, Elberfeld, Dormagen and Uerdingen. In 1945 he was elected to the board of governors of I.G. Farbenindustrie A.G.

On the dissolution of I.G. Farbenindustrie, Ulrich Haberland brought together as one enterprise the four works as well as Agfa and in 1951, it was pos-

sible to re-establish the Farbenfabriken Bayer.

Side by side with outstanding commercial successes, Haberland was interested in the social well being of his personnel, and, as a chemist, he was always closely associated with research, which he fostered not only in his own works but also supported in manifold ways in universities, institutes and libraries.

Mr. Thomas Halliwell, chairman of T. A. Ward and Co. Ltd., wholesale manufacturing chemists of King Street, Blackburn, died on 3 September aged 58. He was also a director of Associated Chemists (Lancashire) Ltd. and Trinity Laboratories and was well known in pharmaceutical circles in East Lancashire. His son, Mr. Roger Halliwell, is with T. A. Ward and Co.

W.R.A. Annual Report Reveals Progress in Coagulation Methods of Water Treatment

WITH the moving of the headquarters of the Water Research Association from Redhill to the new permanent research station at Medenham, Bucks, in May, the organisation attained its full stature as a Research Association, and the research and other work has now been reorganised into a new framework comprising eight divisions. One of these is the Chemistry Division, which now carries out the work of the former Research Division.

Coagulation. The annual report of the Association for the year ended 30 June 1961 describes further advances made by the Chemistry Division in its study of the action of coagulants in removing turbidity, which has reached the stage of testing in simulated service conditions on pilot plant. Work on the coagulation of clay suspensions reported previously showed that the dependence of the required dose of coagulant on the pH of the medium was virtually independent of the nature of the mineral in suspension but was governed by the type of coagulant used and the presence of certain anions. These findings apply only to dilute mineral suspensions, in concentration of the order of 50 p.p.m. The foregoing conclusions have been amply confirmed by work carried out during the last 12 months.

Optimum pH Range

Six coagulants: aluminium sulphate, aluminium chloride, sodium aluminate, ferric sulphate, ferric chloride and ferrous sulphate, have now been studied in some detail. Each coagulant has a definite optimum pH range within which minimal doses are required for a specified degree of clarification. This is unaffected by the nature of the mineral in suspension except for montmorillonite, which behaves anomalously at low pH values. The fact that this mineral is exceptionally well dispersed in aqueous solution may be an explanation.

Ferric sulphate and chloride invariably have a wider optimum pH range and form a larger, heavier floc than the corresponding aluminium compounds. Ferric and aluminium chlorides are effective in a narrower pH range than the corresponding sulphates. Sodium aluminate and ferrous sulphate were both effective in only very narrow pH ranges, except in the case of ferrous sulphate if there was an oxidising agent present.

In studying the effect of dissolved electrolytes on the optimum pH range for a given coagulant, it has been found that in all cases the influence of anions predominates, the effect becoming greater with the ionic charge. As the concen-

tration of anions increases, the optimum pH range of the coagulant tends to shift or extend towards lower pH values. This behaviour is generally more marked with ferric than aluminium coagulants. The magnitude of the effects observed suggests that of the ions commonly found in natural waters, only phosphate is likely to have a significant effect at normal concentrations.

Previous work showed that for coagulation with aluminium sulphate the conditions for optimum coagulant efficiency corresponded closely to those for the rapid precipitation and coagulation of aluminium hydroxide.

Coagulant Efficiency

During the past year the precipitation of the hydrolysis products of the other coagulants studied has been investigated. It has been found that both in the presence and absence of interfering anions the pH range of optimum coagulant efficiency corresponds to that in which the hydrolysis product is most rapidly flocculated. Further, concentrations of aluminium sulphate, aluminium chloride and sodium aluminate equivalent in terms of aluminium concentration are not equivalent in terms of coagulant efficiency. It has been found that there is at least a rough relationship between the relative coagulant efficiency and the amount of hydrolysis product that is precipitated immediately on reaction of the coagulant with water.

The importance of the immediate precipitation and flocculation of the hydrolysis product of the coagulant suggests that the mechanism of turbid water clarification is not coagulation in its true sense. The only true coagulation that takes place is that of the hydrolysis product, particles constituting the turbidity being carried down in the mass of flocculating hydroxide particles. The precise nature of the interaction between the clay and hydroxide is not clearly understood but is being studied by electrophoresis.

A technical report dealing with the effect of electrolytes on coagulation with aluminium compounds is to be published shortly. In this report it is shown that recent investigations into the co-ordination chemistry of aluminium can throw light on the mechanism by which anions interfere with the precipitation of aluminium hydroxide. Future reports will deal with coagulation by iron compounds and the influence of concentration of suspended clay.

Isolation of Organic Matter. In some parts of the British Isles, the problem is to remove dissolved colouring matter rather than suspended particles. This is

also performed by a coagulation process, although the chemical mechanism is probably different than that involved in the turbidity treatment. An apparatus capable of dealing with water at flow rates of 60-100 g.p.h. has been constructed and is in use on water from the River Thames. The method provides for the adsorption of the organic matter on a highly porous anion exchange resin in the chloride form and removal by subsequent elution with 10% sodium chloride solution. The technique has proved to be very effective but there is difficulty in the removal of the sodium chloride from the concentrated organic extract. A study of this problem is complicated by the wide molecular weight range of the compounds involved. No commercially available dialysis membrane could be found which would retain all of the material. The coloured organic compounds could be adsorbed on a carbon column but desorption with distilled water gave a poor recovery. Finally, a method was worked out based on a combination of adsorption on carbon and ion exchange. This gave a much better recovery than other techniques tested so far but an even better method is being sought.

It is proposed in the near future to begin isolating the organic colour from a number of raw water sources and to study the properties of the material so obtained.

Among other subjects discussed in the Association's report are the use of nitrous oxide for the detection of leaks in water mains, and apparatus for measuring the impact strength of plastics pipes.

New Technique for Drying Solvents

A METHOD of drying organic solvents, which is claimed to effect a ten-fold improvement on the established methods, has recently been published by a Russian chemist. It uses lead tetraacetate which reacts with water to give lead dioxide and acetic acid. The lead dioxide precipitates and is easily removed, and the acetic acid is extracted by fractional distillation.

The best results are obtained at 85°C or the boiling point of the solvent whichever is lower.

The author also describes a new improved method for the preparation of lead tetraacetate which involves the anodic oxidation of lead diacetate dissolved in acetic anhydride.

Sulphate of Ammonia Federation Change of Address

From Friday, 29 September, the registered office of the British Sulphate of Ammonia Federation Ltd. will be transferred to 24/30 Gillingham Street, Victoria, London S.W.1 (telephone: Victoria 0314-5-6). The Association ask that all correspondence at present being addressed to the secretarial and accounts department at Thornycroft House, Smith Square, London S.W.1, should now be sent to the new address.

Overseas News

JAPANESE BHC AND PVC PLANTS FOR INDIA AND PHILIPPINES

IN co-operation with C. Itoh and Co., and Chiyoda Chemical Engineering and Construction Co., Kureha Chemical Industry of Japan have signed contracts for the export of a 10 tonnes/day capacity p.v.c. plant to the Philippines and for a 5 tonnes/day BHC plant for export to India.

In addition, Kureha Chemical, co-operating with Marubeni-Iida and Chiyoda Chemical Engineering are to supply a 45 tonnes/day plant to India.

Currently five Indian companies are manufacturing vinyl chloride monomer, two with Japanese processes, two using West German technique and one based on a U.S. licence. Capacity of each plant is 25 tonnes/day. The p.v.c. plant to be exported to India by Kureha, through Marubeni-Iida, is destined for the D.C.W. Company, who, because they have no source of carbide, are to purchase a carbide plant from the Japanese firm, Showa Denko.

Foreign Interest in Belgian Chemical Industry

According to a statement issued by the Belgian Ministry of Trade, non-Belgian interests invested Fr.576,350,000 in Belgium's chemical industry last year. Among U.S. companies which formed subsidiaries or part-subsidiaries in Belgium in 1960 were American Steriliser Co., Economics Laboratory Inc, and Monsanto Chemical Co.

Ethylene-propylene Rubber Plant for Enjay Chemical

Enjay Chemical, the chemicals operating company of Standard Oil (New Jersey), are planning the construction of a commercial scale plant for the production of ethylene propylene rubbers. The material is already being made in developmental quantities at Baton Rouge, La. Introductory price is 26 cents/lb.

French Chemical Investments Up

The French National Institute of Statistics announces from Paris that investments of the country's chemical industry are this year higher by 30-50% than in 1960. This compares with a rise in investments for private enterprises in French industry as a whole of some 13%.

Soviet Bloc Co-operation on Drug Production

The pharmaceuticals working party of the Eastern European economic co-operation body, Comecon, is to meet in Sofia, Bulgaria, during the coming week to work out recommendations for the development of pharmaceutical products which must currently be imported by the Soviet zone of Germany from the

free world and production of which in East Germany itself is either impossible or undesirable in the near future.

The Soviet zonal authorities in Germany have already announced that 1961 will see the production in East Germany of some 25 million Marks' worth of pharmaceuticals hitherto imported from Federal Germany. The ban on private imports by individuals of necessary medicinal preparations into Communist-dominated Germany continues.

Dow Polystyrene Plant for Italy

Dow Chemical International Ltd., subsidiary of the U.S. Dow Chemical concern, has placed an order with Foster Wheeler Italiana, of Milan, for the erection at Leghorn, Italy, of a plant for the production of polystyrene resins. The unit will have an annual capacity of some 16,000 tonnes. It will be operated by Dow's Italian subsidiary, Dow Chemica Italiana S.p.A., production to start at the end of 1962. Products will be marketed under the trade name of Styron.

Mitsui Chemical to Triple Cumene/Phenol Output

Mitsui Petrochemical, who are currently producing 1,000 tonnes/month of phenol and 600 tonnes/month of acetone via the Distillers-licensed cumene process, have had Government approval to revise their contract with the Distillers Company Ltd. and to raise monthly capacities to 3,000 tonnes of phenol and 1,800 tonnes of acetone.

Sulphite Cellulose Plant for Sweden

A new sulphite cellulose plant is being constructed at Ivetofta, Sweden, by Nymolla AB Cellulose. The capacity of the new plant will be 70,000 tonnes a year, most of which will be exported. The investment involved is 90 million Swedish crowns.

Japanese Titanium Dioxide Strike Ends

Full production of titanium dioxide has now been resumed by Ishihara Sangyo, Osaka, following the end of a five-month strike over wage demands and a rationalisation programme. Monthly capacity is reported to be 3,000 tonnes.

European Research on Rare Elements from U.S.

The U.S. Atomic Energy Commission is to supply 12 samples of four rare transplutonium elements (having a higher atomic number than plutonium) to scientists in five European countries: Belgium, France, Western Germany, Norway and Sweden, all of which have agreements for

co-operation with the U.S. for research and development in the peaceful uses of atomic energy.

The materials to be supplied are americium-243, curium-244, berkelium-249 and californium-252, which were produced under a long-range programme for the production of transplutonium elements and isotopes for research.

New PVC Producer for Austria?

The Austrian aluminium producers Salzburger Aluminium GmbH, of Lend, are planning to resume production of carbide; the company was a medium-scale carbide producer before the last war, using its own electricity as base. The carbide to be produced in the new project will be processed into acetylene and polyvinyl chloride. Hitherto the Halvic GmbH concern, of Hallein, has been Austria's sole p.v.c. producer.

Benzole from New German Coke Ovens

Some 18,000 tonnes/year of benzole will be the eventual output of a new West German coking plant, the first stage of which has now been opened by the Gelsenkirchener Bergwerks-AG concern, Essen. Initial production is 2,500 tonnes/day of coke and will be brought up to 5,000 tonnes/day—and the 18,000 tonnes/year of benzole mentioned—by the end of the year. Further expansion of output to 7,500 tonnes/day of coke and some 27,000 tonnes/year of benzole is foreseen for the future.

U.S. Survey on Soviet Corrosion Research

Current Soviet research in corrosion apparently is on a par with similar investigations in the Western world, but there is no evidence that the Russians are on the verge of any major breakthrough in this field. This is the conclusion drawn in a recent evaluation of 1,500 references from Soviet technical literature for the period 1950-60. The results of this evaluation are contained in a 143-page survey released through the Office of Technical Services, Business and Defence Services Administration, U.S. Department of Commerce, Washington 25, D.C.

Polish Dyestuffs Plant for U.A.R.

Under a recently-signed trade agreement between the two countries, Poland is to supply the United Arab Republic with a complete plant for textile dyestuffs production worth some \$U.S.4 million. The plant will come into use in the second half of 1965.

Swiss Chemical Plant for India

Krebs & Co. AG, Zurich, Switzerland, are to design, deliver and set in operation chemical plant for the production in India of chlorine, caustic soda and chlor-alkali derivatives. The equipment will be built by a number of Swiss firms and delivery is covered by a Swiss-Indian credit agreement.

A caustic soda plant with an annual capacity of 17,000 tonnes will go to the

Kanoria concern's plant at Pipri in Uttar Pradesh, a plant for the yearly output of 3,400 tonnes of caustic soda and 1,000 tonnes of alkali sulphate to the State-owned Travancore-Cochin Chemicals plant near Cochin in Kerala and a 3,400 t.p.a. chlorine unit to the State-owned National Newsprint and Paper Ltd. firm of Napanagar in Madhya Pradesh. All plants are to come into use in 1963.

Second Dutch Resins Plant for Synres

N.V. Chemische Industrie Synres are to build a second resin plant at their Hook of Holland site, which will raise total annual capacity to about 35,000 tonnes. This expansion was decided on following the company's steady growth.

Products to be made in the second resins unit will be a.o. plasticisers, resin dispersions and amino resins. It is hoped to bring the extension into production in the second quarter of 1962. Construction and equipment has been designed by Synres' construction department in close co-operation with Allied Chemical Corporation, New York.

Synres already have under construction a phthalic anhydride plant at the Hook of Holland. Also being built in conjunction with Allied Chemical, this plant will have an annual capacity of 5,000 tonnes, when completed in 1962.

More Chemical Imports for Brazil

Figures issued from Rio de Janeiro show that so far this year the share of chemical and pharmaceutical imports in total Brazilian imports has risen to 10.2%. Chemical and pharmaceutical constitute the country's third most important commodity group. Corresponding figures for last year, for that part of it covered by the statistics for 1961 as yet available, show a share of only 9.2% of the total.

Increase in Fertiliser Production in the Transvaal

An expansion programme amounting to £1.9 million is being planned by the South African company, Foskor, in the Eastern Transvaal. The object is to increase the production of phosphate concentrates, at present amounting to 150,000 tons a year. The expansion is expected to be completed by September 1962.

Rhodesian Fertiliser Plant Proposals Postponed

Closing date for the submission of proposals for the establishment of a nitrogenous fertiliser and explosives plant in the Federation of Rhodesia and Nyasaland has been postponed from 30 September until 31 December next, owing to the delay in the completion of the oil refinery project and because of inability of the Federal Ministry of Commerce and Industry to supply a price for the large-scale use of Kariba power.

Negotiations for the construction of the refinery were expected to be completed by the end of this month. A Ministry spokesman said that unforeseen difficulties had

greatly delayed the decision regarding the price of Kariba power for an electrolytic hydrogen plant.

Italian Firm to Supply Urea Plant to Argentina

A \$12 million urea plant will be supplied to Argentina by Finmeccanica, the metalworking holding of the I.R.I. group. The plant will require additional expenditures of \$8 million for the procurement of locally available equipment and materials. Montecatini will supply technical assistance and engineering services.

Shell Poly-cis-butadiene Project in France

Shell has signed an agreement with the Goodrich-Gulf and Montecatini concerns by which it obtains exclusive rights to manufacture poly-cis-butadiene in France and making use of Ziegler catalysts. The licences and patent rights concerned are intended for the use of Société des Elastomères de Synthèse, a company in which Shell has a holding and which already has a plant at Berre for the production of styrene-butadiene synthetic rubber.

S.B.A. Acetylene Process For Texas Plant

A plant for the production of 100 million lb./year of acetylene from natural gas is to be built at Pasedena, Texas, U.S., under an agreement between the Societe Belge de l'Azote et des Produits Chimiques du Marly (S.B.A.) of Liege, Belgium, and the Tenneco Chemical Co. of Houston, Texas, who will operate the plant. S.B.A. grant a licence for their acetylene process to Tenneco, while M. W. Kellogg have been entrusted with the engineering and construction of the plant.

Thai Government Restricts Size of Refinery

The Summit Industrial Corp., one of the two companies granted a right to build an oil refinery in Siam, have ac-

cepted the new Government condition that the capacity should not exceed 20,000 b.p.d. Originally Summit Industrial, backed by American Philippine Petroleum Co., planned a 30,000 b.p.d. capacity.

The other company, Thai Oil Refinery, backed by British Shell Co., was to build a refinery with a capacity of 40,000 b.p.d. Thai Oil have said that it would be uneconomical to run the refinery at half capacity.

The present oil requirements of Siam are estimated at 35,000 b.p.d.

U.S. Chemical Firm Awards \$11 M. Rocket Contract

Thiokol Chemical Corp. have awarded a contract, valued at \$10,935,000, to the Allison Division of General Motors for the production of first stage rocket engine cases for the U.S. Air Force Minuteman intercontinental ballistic missile. The contract follows two years intensive development work by Allison Division on thin-wall lightweight steel cylinders in which the propellant charge is contained.

Heavy Water and Chemical Project in Egypt

The economic Development Organisation, of Cairo, has announced that in the period 30 June 1961 to 30 June 1962 it plans to invest a total of £E3 million in the production in Egypt of heavy water, £E1 million on the production and extraction of various chemicals from a molasses base and a further £E1 million for a project concerned with the manufacture of calcium carbide.

Radioisotope Venture Planned in Tokyo

Japanese Government approval is being sought for the plans of Dai Nippon Seiyaka, Osaka, pharmaceutical producers, and Sari, a Swiss subsidiary of Abbott Laboratories, to produce radioisotopes at Matsudo, Tokyo. The plant should be in production, under the name of Dainabo Radioisotope Laboratories Ltd., by the middle of next year.

Montecatini Built Peruvian Complex



The plants of Fertilizantes Sintetico S.A. built at Callao, Peru, by engineers of Montecatini

Aluminium Cuts Heat Losses and Corrosion in New South African Urea Factory

EXTENSIVE use of aluminium for roofing, wall cladding, pipe lagging, sheathing and ducts is a feature of the new urea plant of African Explosives and Chemicals Ltd., recently completed at Modderfontein at a cost of some R20 million. As well as the new urea plant, modifications and extensions have been made to an existing ammonia plant, the latter being adapted to a capacity of 50,000-120,000 tons/year of ammonia. The new and extended plant also includes facilities for production of carbon dioxide as a by-product of ammonia manufacture.

In the 'dressing room', where the urea solution is processed or granular urea is dressed, all the tanks and pipes are sheathed in aluminium because the free ammonia in the atmosphere would corrode most other materials. Corrugated aluminium sheet has been used to roof and clad the steam raising plant, bagged products store, air separation plant and carbonisation plant. The bagged products store, which can hold approximately 2,200 tons of bagged urea and other products from two sister factories, has an aluminium roof.

Since urea is slightly hygroscopic, the whole of the bagging-off plant is pressurised and heated, and the granulated urea is fed into the bagging-off plant through a sealed and pressurised conveyor gallery roofed and clad with aluminium corrugated building sheet.

Pressurising and heating of the huge bulk store is effected by means of two large aluminium ducts running the length of the building, the heating installation itself being also fabricated in aluminium sheet. The bulk products store has a total length of 230 ft., is 130 ft. wide and has a paraboloid roof measuring 65 ft. from floor to apex. It has a capacity of 22,000 tons.

Describing the installation in the current issue of their *Aluminium News*, Alcan International Ltd. reveal that Alcan sheet is used to sheath the complex of pipes and large tanks which make up the carbon dioxide purification plant. Aluminium is also used as lagging for the maze of piping which forms part of the first and second stage reactors, where the carbon dioxide and ammonia are combined to form urea carbamate.

PVC Coating for Acid Plant Chimney

A COATING based on Geon p.v.c. is reported to have proved effective in protecting a 150-ft. high metal chimney at the new sulphuric acid plant of F. W. Berk and Co. Ltd. at Stratford, London. A chimney of this height was necessary to meet the requirements of the Clean Air Act. However, the maintenance engineering staff wished to avoid the heavy cost of periodic painting and the possible early replacement of upper sections exposed to acid dewpoint conditions.

Coating was carried out by Plastic Coatings Ltd., Guildford. Sections of the 2 ft. 6 in. dia. chimney were immersed in a tank containing a paste based on

Geon 121 resin, thus coating both sides and flanges. When gelled, the paste forms a smooth abrasion resistant coat with excellent adhesion to the metal. The coat is not affected by weather and requires no form of maintenance. And being corrosion-resistant, it protects the interior of the chimney from the acidic conditions of the plant.

In all 100 ft. of chimney were coated (the entire height above factory roof level), and at a recent inspection the effectiveness of the coating was already apparent.

Geon 121 p.v.c. paste resin is manufactured by British Geon Limited.

Kellogg move to New London H.Q.

THE Kellogg International Corporation have moved into Kellogg House, Baker Street, from the offices they have occupied in Chandos Street, Cavendish Square, for the past eight years. Kellogg, who are constructional engineers in the chemical and petroleum processing field, say that rapid development of the Corporation's activities has made the move necessary. The various departments, hitherto housed in three separate buildings, will now be under one roof.

Elaborate planning preceded the move, which involved more than 500 personnel and some 9,000 items of equipment.

Good Response to Strike Call Expected

An 80% response is expected to the call to strike made to Civil Servants by the unofficial Assistant Scientists' Action Committee. The token strike, called for Friday, 22 September as a protest against the Government's pay pause, will affect food sampling and research work in Government Departments.

I.C.I. Transfer to Runcorn

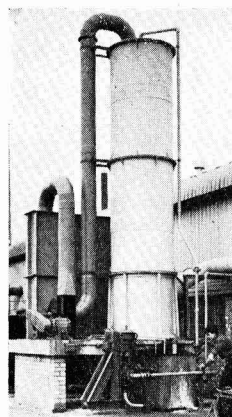
It was announced recently that the General Chemicals Division headquarters of I.C.I. now in Cunard Buildings, Liverpool, should be completely transferred to a new building at Heath Road, Runcorn, by autumn 1962.

Gas Industry's £2 Million Surplus

THE U.K. gas industry made a profit of nearly £2 million in the past financial year, stated Sir Henry Jones, chairman of the Gas Council, at the centenary annual meeting of the Scottish Association of Gas Managers in Edinburgh last week. He added that he would be disappointed if a surplus was not earned again in the current year. It had previously been indicated (C.A., 22 July, p. 124) that a financial surplus had been achieved by the industry during the year ended 31 March 1961. At the Edinburgh meeting, Sir Henry said the gas industry was rapidly changing, but he believed that the next five years would see a steady reduction in the costs of gas production and supply.

It will be recalled that the Select Committee on the Nationalised Industries recently published its conclusions on the gas industry as summarised in C.A., 26 August, p. 297.

Vybak Scrubbing Tower Handles Corrosive Gases



This 18 ft. high scrubbing tower, together with its eliminator, was made by Plastic Filters Ltd. of Horsham, Sussex, for Johnson and Sons Smelting Works Ltd., Enfield. Handling hydrochloric acid gas, chlorine and nitrous fumes and other miscellaneous gases at temperatures up to 110°C, it is fabricated from Vybak (p.v.c.) industrial rigid sheet bonded to an outer casing of polyester/glass laminate. Vybak is supplied by Bakelite Ltd., 12-18 Grosvenor Gardens, London S.W.1.

Commercial Use of Colliery Methane Planned

Plans for the commercial use of methane drained from collieries are likely to be announced by the North-Eastern Division of the National Coal Board by the end of the year. At present the Yorkshire coal field has 26 pits with drainage installations extracting more than 4,000 cu. ft. of pure methane per min. About 1,500 cu. ft. per min. are being discharged through pipes at the surface of five collieries.

BRITISH OXYGEN INTRODUCE VERSATILE NEW ROAD TANKER



British Oxygen's
new tanker

ADDED to the 1,100-strong commercial fleet of British Oxygen is a road tanker which carries the liquid equivalent of 150,000 cu. ft. of gaseous oxygen—equalling about 12 lorry-loads of cylinders. It can also carry liquid nitrogen or liquid argon. The capacity of the tanker is the result of a survey carried out by British Oxygen to find a vehicle suitable for both customer deliveries and inter-depot transfers of bulk supplies.

The first of the new tankers are built on an Albion Clydesdale chassis (type C.D.I.A.Y.), powered by a Leyland 400 Power Plus diesel engine developing 125 b.h.p. The aluminium tank and fittings

were designed and manufactured by British Oxygen's Engineering Division. An electrically-driven pump, similar to units now being added to other tankers in the fleet, is built in. The pump fills storage tanks twice as fast as conventional decanting methods, and is an important part of an extensive programme for modernising, improving and extending British Oxygen's distribution system.

With the upper part white and the lower part dark blue, the first tanker ordered is now delivering liquid oxygen from British Oxygen's depot at Crawley, Sussex, to Southampton customers.

Dermatitis from Synthetic Resins

THE Factory Inspectorate of the Ministry of Labour has issued a memorandum on the Prevention of Industrial Dermatitis from Synthetic Resins (form 331), available from H.M. Stationery Office, price 4d.

With the increased use of synthetic resins in the manufacture of paints and varnishes and in other processes has come an increase in the danger of industrial dermatitis. The memorandum suggests various precautions that could be taken whenever these resins are handled.

A cautionary notice (form 336) has been prepared for the advice of workers using synthetic resins, and the Factory Inspectorate suggests that this should be displayed for the education and co-operation of the workpeople concerned.

Loading of Hinkley Point Reactor to Begin in March

A start is expected to be made on loading uranium fuel into the first reactor of the English Electric/Babcock and Wilcox/Taylor Woodrow-built 500 Mw. Hinkley Point nuclear power station in March of next year. The reactor is expected to go critical a week later and full power production to be reached within three months.

New Deposits of Salt Anhydride Revealed

DISCOVERY of a commercially workable deposit of anhydrite at Avoniel, East Belfast, Northern Ireland, is among recent activities noted in the 1960 report of the Geological Survey and Museum (H.M.S.O., 5s). A borehole was put down to a depth of 600 ft., drilling being completed early in 1960, and some 16 ft. of massive anhydrite was proved at depths between 365 and 381 ft.

Another subject mentioned in the report is the salt deposits in Cheshire; with the discovery and assessment of considerable additional deposits in this area the reserves of salt are now estimated to be at least 400,000 million tons—twice the amount which could previously have been reasonably estimated.

Student Dies in College Explosion

A research student, Mr. J. Williamson, received injuries and burns from which he later died in an explosion at the Royal College of Science and Technology, Glasgow. The explosion occurred in the chemistry department but no indication of the origin could be given. An inquiry is to be held on behalf of the board of the college.

A laboratory assistant, Mrs. Mary Byfield, who was with Williamson when the explosion occurred, is critically ill.

Higher Capital Spending in Chemical Industry

PROVISIONAL estimates for capital expenditure by the manufacturing, distributive and service industries in the second quarter of 1961, seasonally adjusted at 1954 prices, give figures 5% higher than in the first quarter of the year. Almost a third of the increase is attributed to the chemicals and engineering groups of industries, according to the Board of Trade. The provisional estimates show a total expenditure of manufacturing industry, at current prices, of £315 for the second quarter of 1961, or some 32% higher than in the same quarter of 1960, with expenditure on building work up 40% and on plant and machinery up 32%.

In the first quarter of 1961, the chemical and allied industries showed a fixed capital expenditure, at current prices, of £44.7 million, compared with a first-quarter 1960 figure of £37.9 million.

U.K. Atomic Fuel for Italy

SOME 400 tons of natural uranium fuel elements, worth about £8 million, are to be supplied by the U.K. Atomic Energy Authority to the Latina nuclear power station in Italy, under an interim arrangement reached with the Italian S.I.M.E.A. Pending the conclusion of a regular supply contract, the amount of uranium fuel to be produced in the U.K. under the interim agreement should permit the Latina station to operate at its full power of 200,000 kw. electrical net for the next five or six years.

The station, now nearing completion, is being built by the U.K.-based Nuclear Power Group in conjunction with Agip Nucleare of Italy.

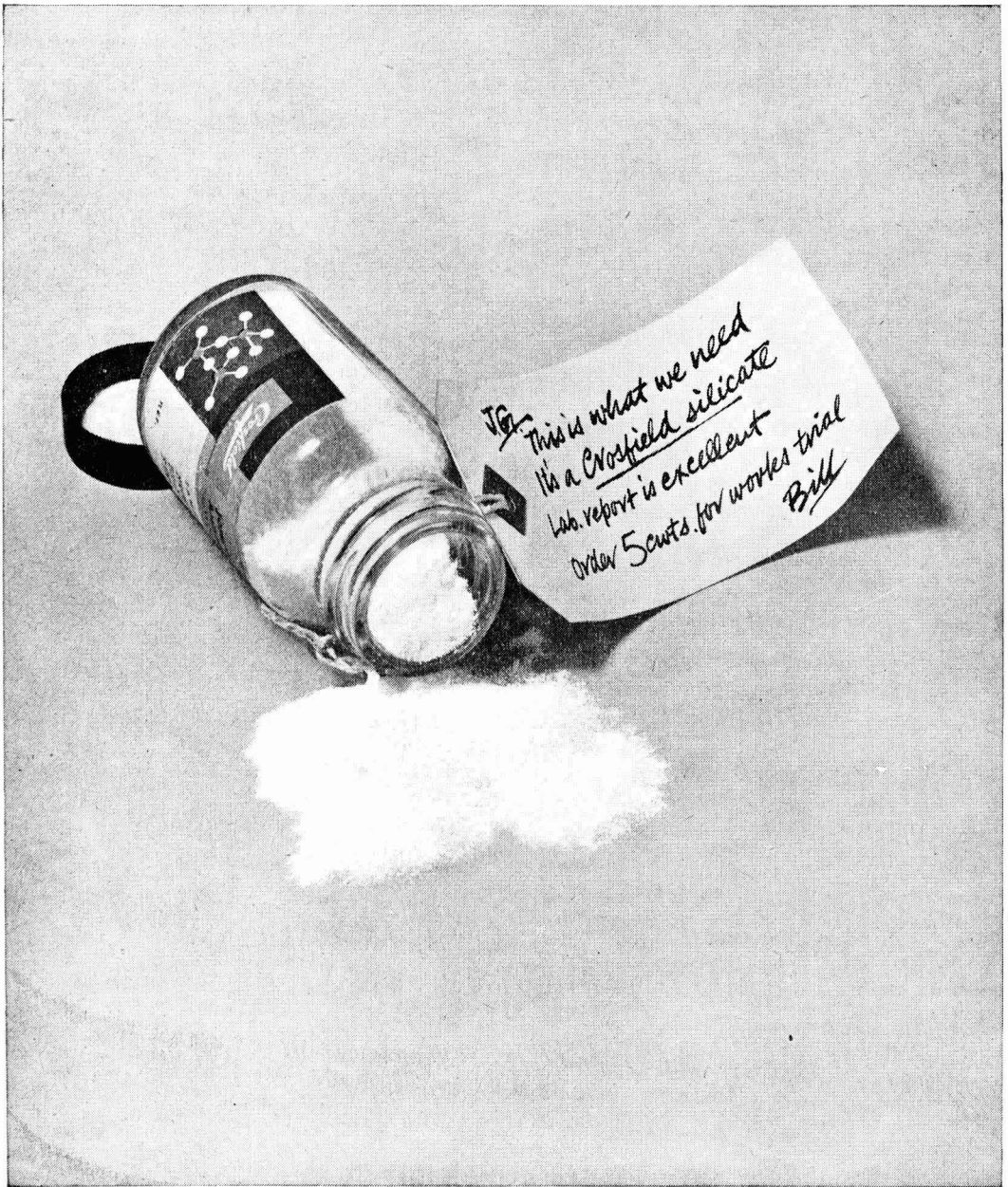
B.S.S. for Glass Fibre Reinforcing Fabrics

First two parts of a new standard dealing with 'Woven glass fibre fabrics for plastics reinforcement' (B.S. 3396) have been published. Part 1 covers loom-state fabrics and Part 2 deals with fabrics which have been subjected to a desizing treatment. The standard is intended to cover glass fibre fabrics woven from continuous filament yarns and, generally after treatment, used for the reinforcement of rigid plastics mouldings and laminates with various resin systems such as polyesters, epoxides, phenolics, silicones and melamines.

Copies of this standard are available from the British Standards Institution, Sales Branch, 2 Park Street, London W.1, price 6s each part (postage extra to non-subscribers).

Fuel Cell Technology

A special course of six lectures on 'Fuel cells for power production' will be given at the Polytechnic, 309 Regent Street, London W.1, on Monday evenings from 6.45-8.45 p.m., commencing 16 October. Fee for the course is £1 1s. Further information is available from the Registrar of the Department of Civil and Mechanical Engineering at the Polytechnic.



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● **Dr. Keith Sellers** has been appointed director of research and development of S. C. Johnson and Son Ltd., Frimley Green, Surrey, manufacturers of wax polishes and finishes, air fresheners and detergents.

● **Dr. D. H. Sharp**, who at present is assistant to one of the managing directors of Fisons Ltd., has been appointed director (technical) of Federation of British Industries as from 1 November. He will take up the appointment on the retirement of the present technical director, **Maj.-Gen. A. J. H. Dove**, who is leaving the Federation at the end of October in order to devote more time to voluntary work. In 1951 Dr. Sharp was invited to join Pest Control Ltd. to apply special liquid phase adsorption techniques to a difficult effluent disposal problem. When this company was acquired by Fisons Ltd. in 1954 he was works manager at Harston. As director (technical) of the F.B.I. he will be responsible for the administration of a wide range of F.B.I. policy and services, including the location of industry, town and country planning, fuel, transport, water supply, trade effluent disposal, industrial research, education, industrial art, technical aid to developing countries, the F.B.I. overseas scholarship scheme, and technical legislation.



Dr. D. H. Sharp



L. E. Puddefoot

● **Mr. L. E. Puddefoot** has been appointed first director of supply of B.B. Chemical Co. Ltd., Leicester. Among his new functions he will be responsible for the purchasing activities of the company. Aged 59, he joined the company in 1931 to start chemical laboratories and to organise the technical and research side of the business. He was appointed a director in 1939, and technical director in 1944.

● **Mr. P. J. March**, director of Shell Chemical Co. Ltd., and general manager, Industrial Chemicals Division, has been appointed to the board of directors of Styrene Co-Polymers Ltd. in succession



P. J. March

PEOPLE in the news

to **Mr. N. A. Iliff**, managing director of Shell Chemical, who has resigned.

● **Mr. F. T. Jones** has been appointed a director of Microcell Ltd., a subsidiary of BTR Industries Ltd.

● **Dr. G. F. Reynolds**, Principal Scientific Officer, in the Chemical Inspectorate, War Office, is resigning this appointment in October to become reader in analytical chemistry at Loughborough College of Technology. Dr. Reynolds has specialised in instrumental methods of analysis, particularly electrochemical techniques and is vice-chairman of the Polarographic Society. He is the author of some 50 papers on the subject.

● **Dr. R. R. Widmann** has been appointed assistant director, international medical research, at Cyanamid's Lederle Laboratories in New York.

● **Mr. R. Kris** has been appointed by BTR Industries Ltd. as manager, thermoplastics mouldings and extrusions. For

the past four years he has been general manager of Aeroplastics Ltd., Glasgow. Sales manager for thermoplastics mouldings and extrusions is **Mr. G. G. Cope**, formerly general manager of Durable Plastics Ltd., Guildford, Surrey, now known as Plastics Coatings Ltd.

● **Lord Amory**, former Chancellor of the Exchequer, has resigned from the board of Imperial Chemical Industries Ltd. following his appointment as High Commissioner for the U.K. in Canada.

● The address of consulting chemical engineer, **Dr. A. J. U. Underwood**, will be 154 Hanover Road, London, N.W.10 (tel.: Willesden 6075) as from 5 October, 1961.

● **Mr. Edward R. Rosenberg** has been appointed plastics sales manager of Du Pont de Nemours International S.A., Geneva, Switzerland, succeeding **Mr. Edmund J. Burrough** who has been transferred to the parent company.



Mr. B. Pinnock (left) and Mr. F. K. Thornton, of I.C.I. Dyestuffs Division, Blackley, at the Autumn Trade Fair in Leipzig. I.C.I. were exhibiting textile dyestuffs (see also 'Distillates')

Market Reports

NO MAJOR CHANGES IN PRICES

LONDON A steady intake against contracts has been reported in the market for industrial chemicals, and there has also been a fair amount of new business on home account, although buyers are inclined to cover no more than short term requirements.

Export trade inquiry is keeping up to recent levels. Prices generally are steady with no major changes other than those reported last week for the chemical compounds of non-ferrous metals.

Among the agricultural chemicals there has been a steady request for the nitrogenous fertilisers. There has been a moderate demand for pitch, and with available supplies of other items finding a ready outlet, firm price conditions continue in the coal tar products market.

MANCHESTER In the home section of the market seasonally adverse factors have almost ceased to operate and the contract movement into consumption has been steady, with a fair amount of new

business also reported. The potash, soda and ammonia compounds are mostly being taken up in relatively good quantities, and there is fair activity in the organic and inorganic acids, formaldehyde, and the barium chemicals, with values generally well maintained.

Export business is on a reasonably good scale, pigments, dyes and intermediate products and plastics being prominent.

SCOTLAND The general trading position has overall been fairly brisk. Buying for the home market has covered quite a varied range of industrial chemicals, and contract demands have also been well maintained. Prices on the whole have been steady with little alteration, although a reduction in the price of glycerine can be reported.

There is still some movement in agricultural chemicals, mostly, as previously mentioned, aligned with weather conditions.

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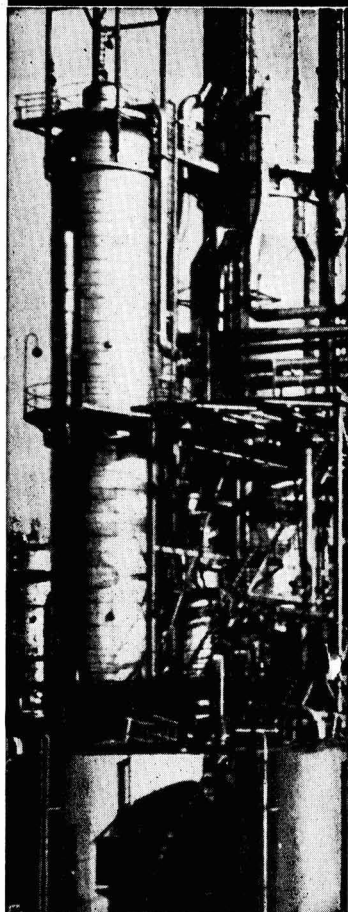
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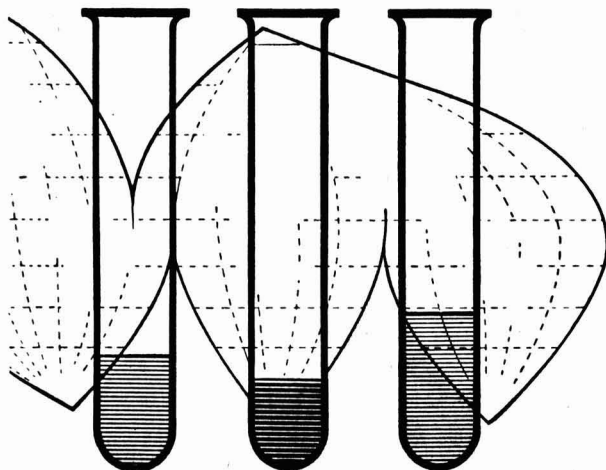
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Commercial News

Aspro-Nicholas

A first interim dividend of 3½% has been declared by Aspro-Nicholas in respect of the year to 31 March. A total of 14% was paid for 1960-61.

Reorganisation of the company's trading activities became effective on 1 April, from which date such activities have been carried out by subsidiary operating companies.

Atlantic Refining

A majority interest in J. P. Frank Chemical and Plastic Corporation, producers of p.v.c. resins, plasticisers, etc., New York, has been acquired by Atlantic Refining. The oil company already has chemical interests, being producers of anhydrous ammonia and synthetic detergents. It has under construction a joint benzene plant with Pure Oil.

B.A. Oil

British American Oil Co. Ltd. should get an increasing share of its earnings in the long-range future from petrochemicals, Mr. E. D. Loughney, president of the company, said in Montreal recently. He described the company's recent acquisition of 25% of Shawinigan Chemicals Ltd, as part of planned expansion in this direction. The 1961 sales of the company were expected to be somewhat better than 1960; however, with continued competitive pressure on refining and marketing operations, volume of sales would be up more, relatively, than dollar value.

In the first half of 1961, B. A. Oil's volume of sales in refined products was 118,184 bbl./day compared with 114,533 in the first half of 1960. Mr. Loughney said he expected volume for the second half to continue at the 118,184 bbl./day level. For the first half B.A. Oil reported a net income of \$13,267,000 or 65 cents/share on total revenue of \$159,210,000.

Cosden Petroleum

Cosden Petroleum, controlled by W. R. Grace and Co., have formed Cosden Petrochemical Corporation in New York, to act as marketing consultants for Cosden's petrochemical activities.

Dominant Chemical

All the shares of the Dominant Chemical Co. Pty. Ltd. in Melbourne, Australia, have been acquired by the Kiwi Polish Co. Pty. Ltd. Dominant Chemical supply industrial chemicals for cleaning in bulk. They will continue to function as a separate entity within the Kiwi organisation. This is an entirely new sphere of activity for Kiwi.

Du Pont

E.I. du Pont de Nemours' task of disposing of their 63 million shares in General Motors (C.A., 27 May, p. 857, and 26 August, p. 300) may be made easier if a Bill that has been approved by the U.S. House of Representatives' Ways and Means Committee is passed

- **B.A. Oil Expect Improved Sales Position**
- **I.C.I.A.N.Z. to Raise Further Capital**
- **Montecatini Half-year Results Satisfactory**
- **United Carbon Profit Down Slightly**

before Du Pont are obliged to start disposing of the shares. The Bill would provide easier tax treatment for shareholders in all cases of forced stock divestitures resulting from anti-trust decrees. Under existing laws, the tax assessment on Du Pont shareholders might exceed \$1,000 million, but if the new legislation is introduced, the tax liability will be reduced to some \$350 million.

I.C.I.A.N.Z

Imperial Chemical Industries of Australia and New Zealand are to raise £A8,768,733 in a one-for-four issue to Ordinary shareholders at a premium of 7s. The issue will raise the paid up capital by £A6,375,354 to £A32,876,772, including £A1 mil. in Preference. The issue, which will be underwritten free of commission by the parent company, follows the three-for-seven scrip issue in June which capitalised £A7,650,426. No indication is given as to why the additional capital is required.

Interchemical-Europe

Interchemical-Europe S.A. is the name of a new chemical industry holding company set up in Fribourg, Switzerland, for "participation in undertakings engaged in chemical production with domicile outside the Canton of Fribourg". The company has an initial company of S.F.1,300,000. Board of directors includes Mr. Lindsay C. Herkness, of Lausanne, M. Louis de Chollet, of Fribourg, and M. Jean Coigny, of Fribourg.

Interunie

The Dutch-based investment fund NV Interunie state that at 31 July their total holdings were worth some Fl.263,010,305 (Fl.229,512,917 at 31 January). Over the same period value of one Interunie certificate rose from Fl.206.65 to Fl.213.50. Some 11.2% of total holdings are now in the chemical and pharmaceutical industry, 8.9% in the oil industry, 1.1% in the natural gas industry and 12.5% in the foodstuffs and soap industry.

Progil S.A.

Progil S.A., the French chemical producers, announce that over the first half of the current year turnover was higher by 17% and exports by 20% than those for the corresponding 1960 period.

Montecatini

Montecatini group results for the first seven months of 1961 have been satisfactory. Sales increased to 223,522 million lire (£128 million) from 196,77 million lire (£115 million), the figure for the corresponding period of 1960.

Montecatini are to participate in the fertiliser production operations of the

Netherlands concern Delta Chemie at Vlaardingen near Rotterdam, while Delta Chemie will interest itself in the Compagnie Nederlandaise de l'Azote, a Montecatini subsidiary on the Dutch-Belgian frontier which also manufactures fertilisers. This is the result of an agreement recently concluded between Montecatini and Delta Chemie, the latter company being a subsidiary of three large Dutch agricultural co-operative organisations.

Reichhold Canada

Reichhold Chemicals Canada Ltd. report net income of \$32,516 for the six months ended 30 June, or 14 cents a share (\$59,252 or 33 cents). Profits declined due to the high cost of naphthalene used in production of phthalic anhydride. The low point was reached in the first half and, if business continues to improve, the full year's sales and earnings should be above the 1960 level.

An interim dividend of 7½% (same) has been declared.

United Carbon Co.

United Carbon Co., U.S., record for the first half of the current year a net profit of \$3,290,000, as compared with \$3,630,000 over the corresponding 1960 period. Sales were of \$27,370,000 (\$28,640,000) while \$970,000 (\$1,330,000) were laid aside for tax. During the second quarter of the year alone net profit was of \$1,650,000 (\$2,160,000).

INCREASES OF CAPITAL

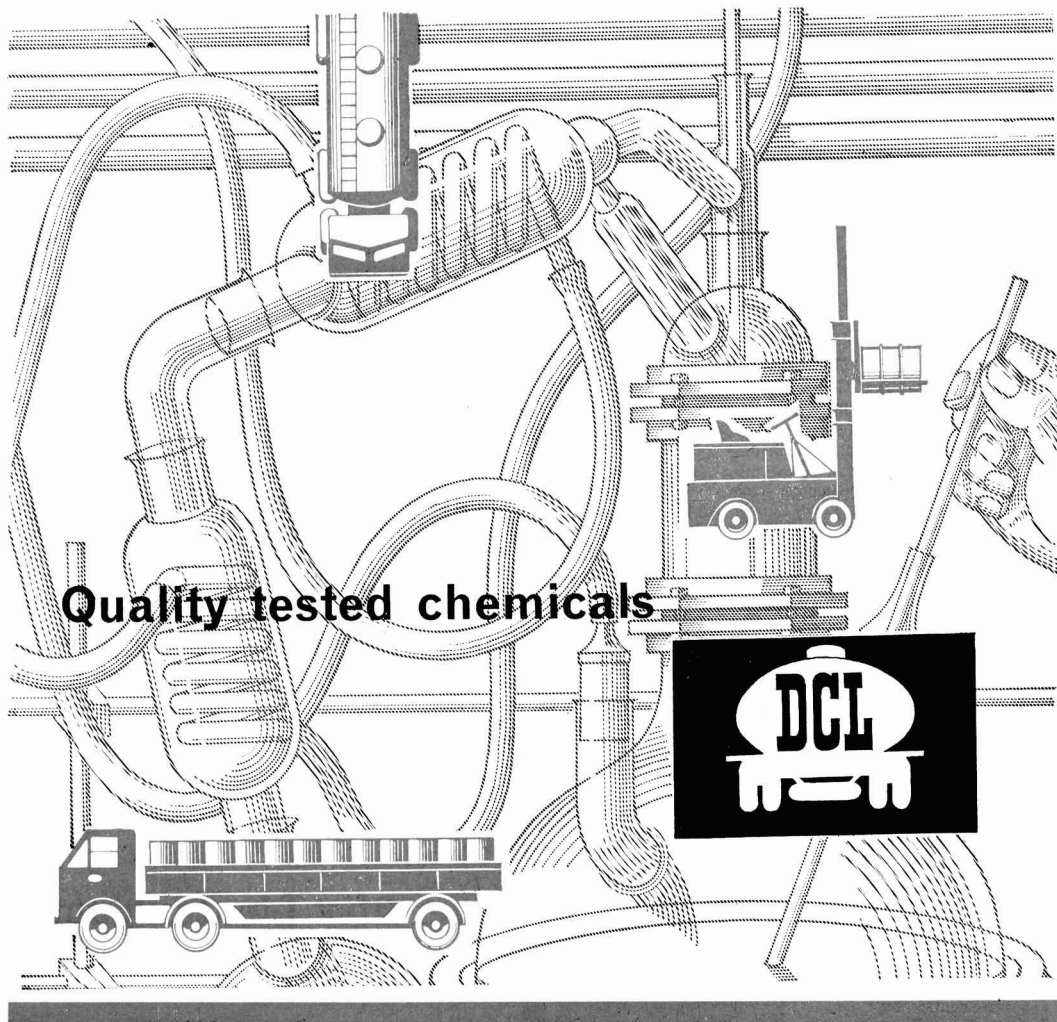
ANIC S.P.A., of Rome, the Italian State holding company with considerable interests in the petrochemical industry, is on 3 October to decide on an increase of capital from 36,000 million to 72,000 million lire. The ANIC-Gela S.p.A. concern, of Gela, responsible for the construction of the Gela petrochemical complex, is to raise its capital from 500 million to 12,000 million lire.

COLIN CAMPBELL MIXERS LTD., consulting engineers to the chemical, petroleum, plastic, rubber and textile industries, etc., 17 Brazenose Street, Manchester 2. Increased by £2,000, beyond the registered capital of £3,000.

ESSO STANDARD ITALIANA, Italian subsidiary of the Esso group, are to double their capital from 10,000 million lire to 20,000 million lire.

GLOVERS (CHEMICALS) LTD., Wortley Low Mills, Leeds 12. Increased by £50,000, beyond the registered capital of £50,000.

M.P.L.P. LTD., vendors of insecticides, etc., 45 The Parade, Cardiff. Increased by £250 beyond the registered capital of £1,000.



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TRADE NOTES

New Polyester Resins

Improvements in basic raw materials manufacture have enabled British Resin Products Ltd. to announce additions to their range of Cellobond polyester resins and a general reduction in polyester resin prices. Eight new isophthalic based polyester resins, a new general purpose resin (A.2624) selling at below 2s lb. for over 2,000-lb. lots and T.1442, a new promoter, are now available in addition to the established grades. A revised price list and new information sheets are available on application to British Resin Products Ltd., Devonshire House, Piccadilly, London W.1.

Spray Nozzles

Various types of Lechler spray nozzles for the atomisation of liquids, with illustrations showing the types of sprays produced, are listed in a pamphlet from Ascog Ltd., 44 Theobalds Road, London W.C.1.

Metal Chelating Compound

The General Chemical Co. Ltd., Judex Works, Sudbury, Wembley, announce that they will shortly have available an addition to the range of Judex newer metal-chelating compounds; this is di-(2-aminoethoxy)ethanetetraacetic acid which will be available in 25 g. and 100 g. packs.

Pressure Sensitive Adhesive

A suggested formulation for pressure sensitive adhesives incorporating Durez

resin No. 209 and neoprene type WRT has been issued by Omni (G.B.) Ltd., 35 Dover Street, London W.1, from whom copies of the formulation, samples and prices of the resin are available.

Epoxide Resin Laminates

Improved chemical resistance, particularly to caustic alkali solutions, can be obtained by using Bakelite epoxide resins for reinforced plastics laminates, it is claimed by Bakelite Ltd., 12-18 Grosvenor Gardens, London S.W.1. The company have now produced an advance information sheet, E.46, which describes the method of producing epoxide resin bonded glass laminates by the 'wet lay-up process'. Basically the method is very similar to that used with polyester resins and differs only in detail to accommodate the different wetting and curing characteristics of the epoxide resin systems.

Granular Pigment

Introduction by I.C.I. Dyestuffs Division of a granular form of the pigment Monolite Fast Scarlet RNS is claimed to mark an important advance in pigment technology. Advantages claimed include absence of dusting, easier handling and, in some cases, quicker incorporation in the dispersing medium.

The individual granules in Monolite Fast Scarlet RNS granules are cylinder-shaped and approximately $\frac{1}{4}$ in. by $\frac{1}{4}$ in. No dedusting or binding agent has been

added during their preparation and the new granules are exactly the same in tinctorial and fastness properties as the powder. It is stated that the granules are stable to normal transportation handling, but break down easily and completely in the pre-mixing operations which precede processing in dispersing equipment.

Change of Address

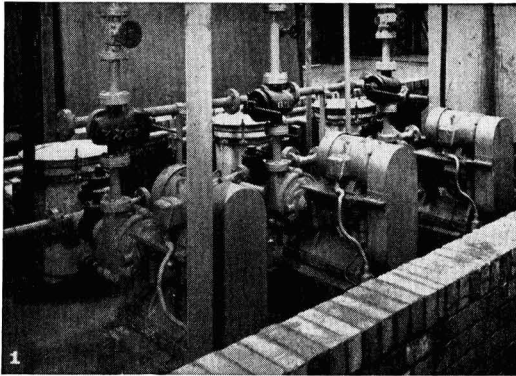
Home and export sales departments of Foamite Ltd. are to be transferred to Victoria Road, Feltham (Feltham 3691), where the works are situated.

Brooks Instrument in U.K.

Brooks Instrument Ltd. has now been established in the U.K. as a subsidiary of Brooks Instrument Co. Inc. of Hatfield, Pa., U.S., manufacturers of industrial instruments used for the indication, integration transmission and control of flow rates for liquids and gases. The U.K. company is now operating from Brookmeter House, Cross Lane, Marple, Cheshire, with Mr. D. Y. Smith as managing director.

Silicones in Engineering

A 24-page booklet with the above title shows how silicones are being used in many branches of engineering and gives many examples of their successful application. Fully illustrated, it also lists suppliers of components or equipment made with MS silicones, and names other publications available. Copies of the booklet (coded A.11) are available from Midland Silicones Ltd., 68 Knightsbridge, London S.W.1.



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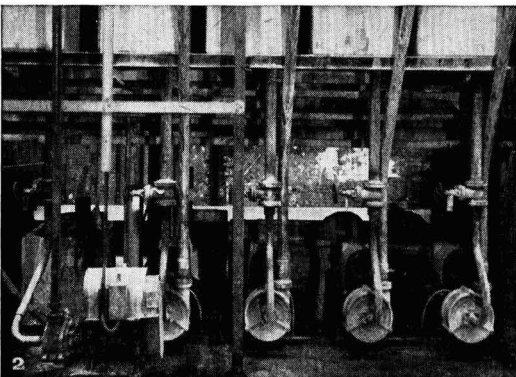
ORGANISATION

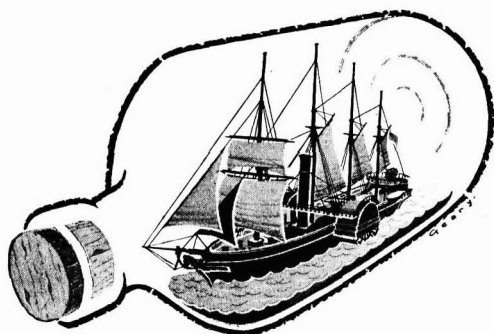
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NEW PATENTS

By permission of the Controller, H.M. Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2., price 3s 6d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

ACCEPTANCES

Open to public inspection 25 October

Production of superphosphates. Chemical Construction (G.B.) Ltd. **880 777**
 Hydrocarbon copolymers and their method of preparation. Dunlop Rubber Co. Ltd. (Adamek, S., Dudley, E. A., and Woodhams, R. J.) **880 904**
 Artificial filaments, fibres and yarns consisting of organic acid esters of cellulose. Eastman Kodak Co. **880 688**
 Polyether-carboxylic acid compounds. Farbenfabriken Bayer AG. **880 524**
 Method for devolatilising polymeric compositions. Dow Chemical Co. **880 906**
 Production of formaldehyde. Bergbau-Aktiengesellschaft neue Hoffnüng. **880 873**
 Pyrimido-[4:5-B]-quinoxalines and a process for their manufacture. Ciba Ltd. **880 480**
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R.I.C. Lecture Series

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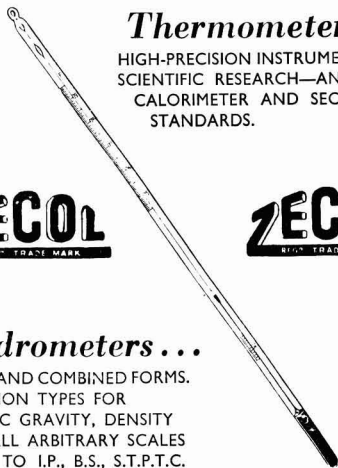
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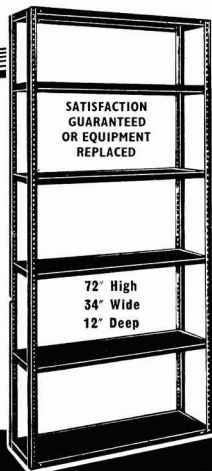
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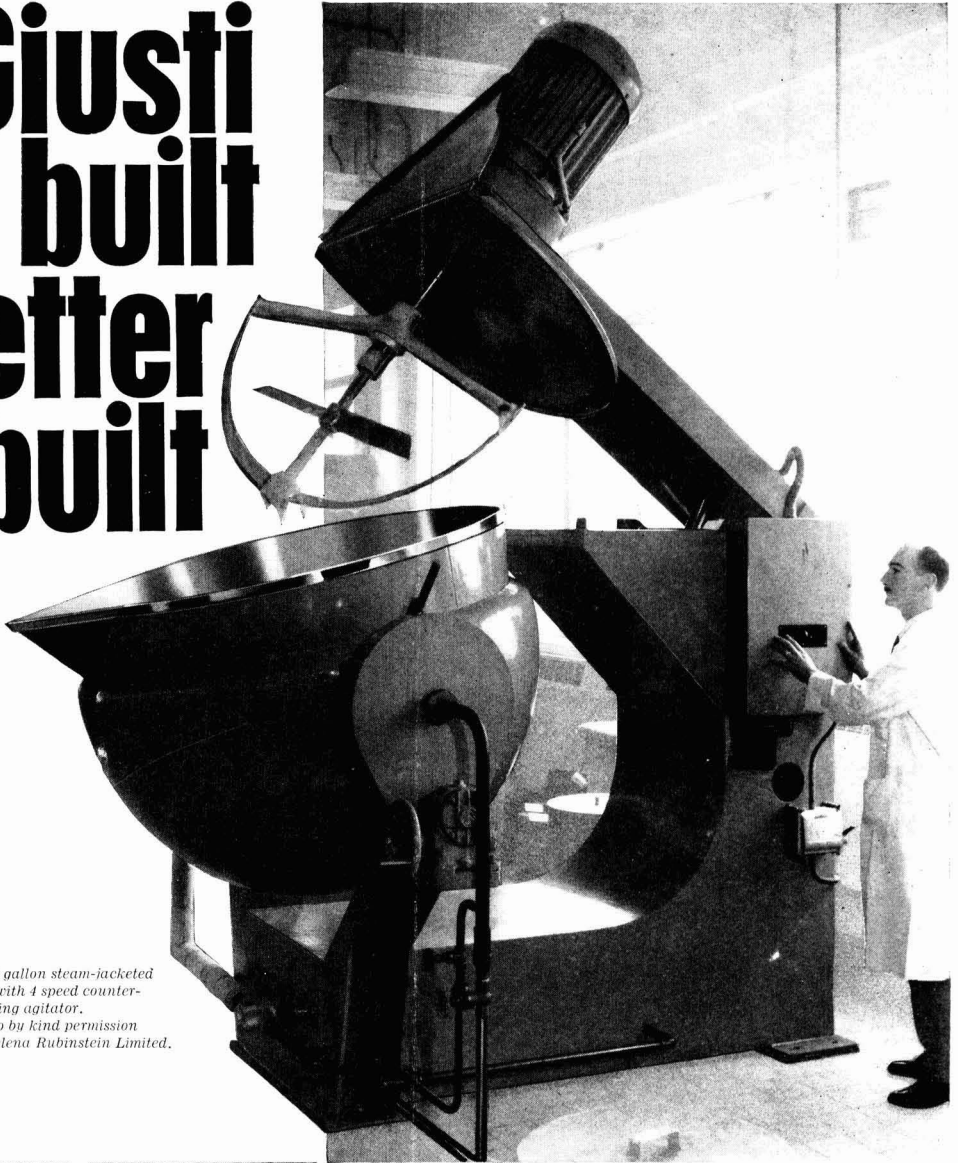
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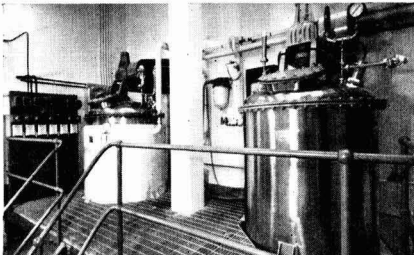
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