Chemical Age

incorporating

PETROCHEMICALS and POLYMERS

26 May 1962. Vol. 87. No. 2237

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY

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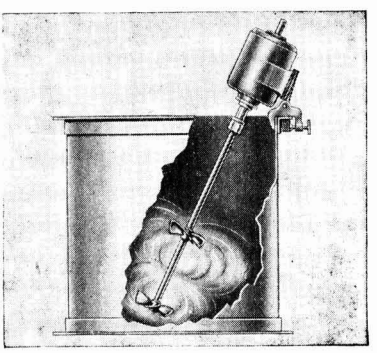
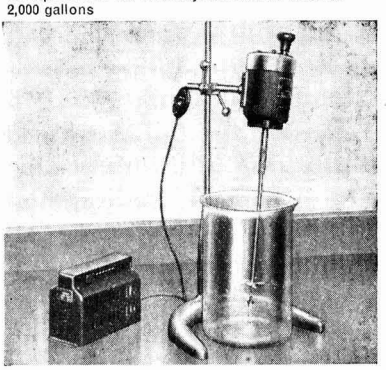


A High Speed Stirrer, of 1440 r.p.m. or more. Mainly for liquids with low viscosity. Can mix as much as 2,000 gallons



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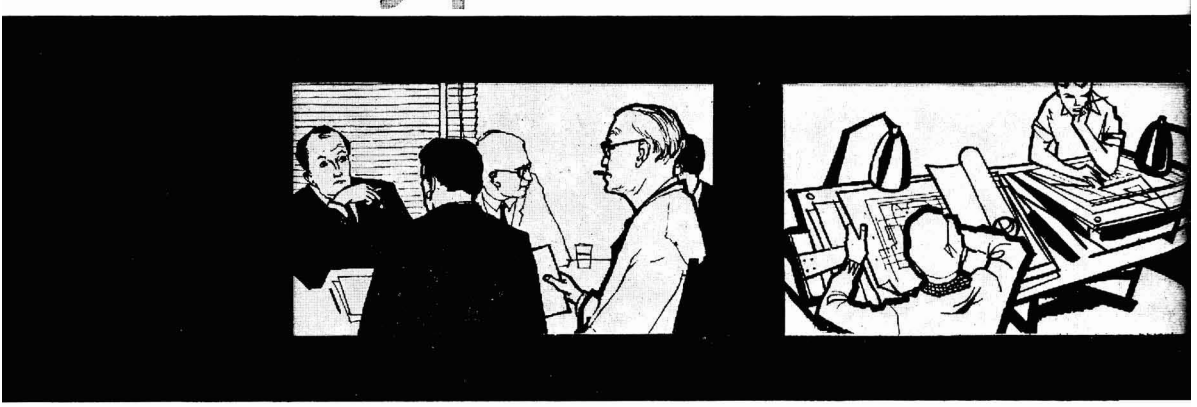

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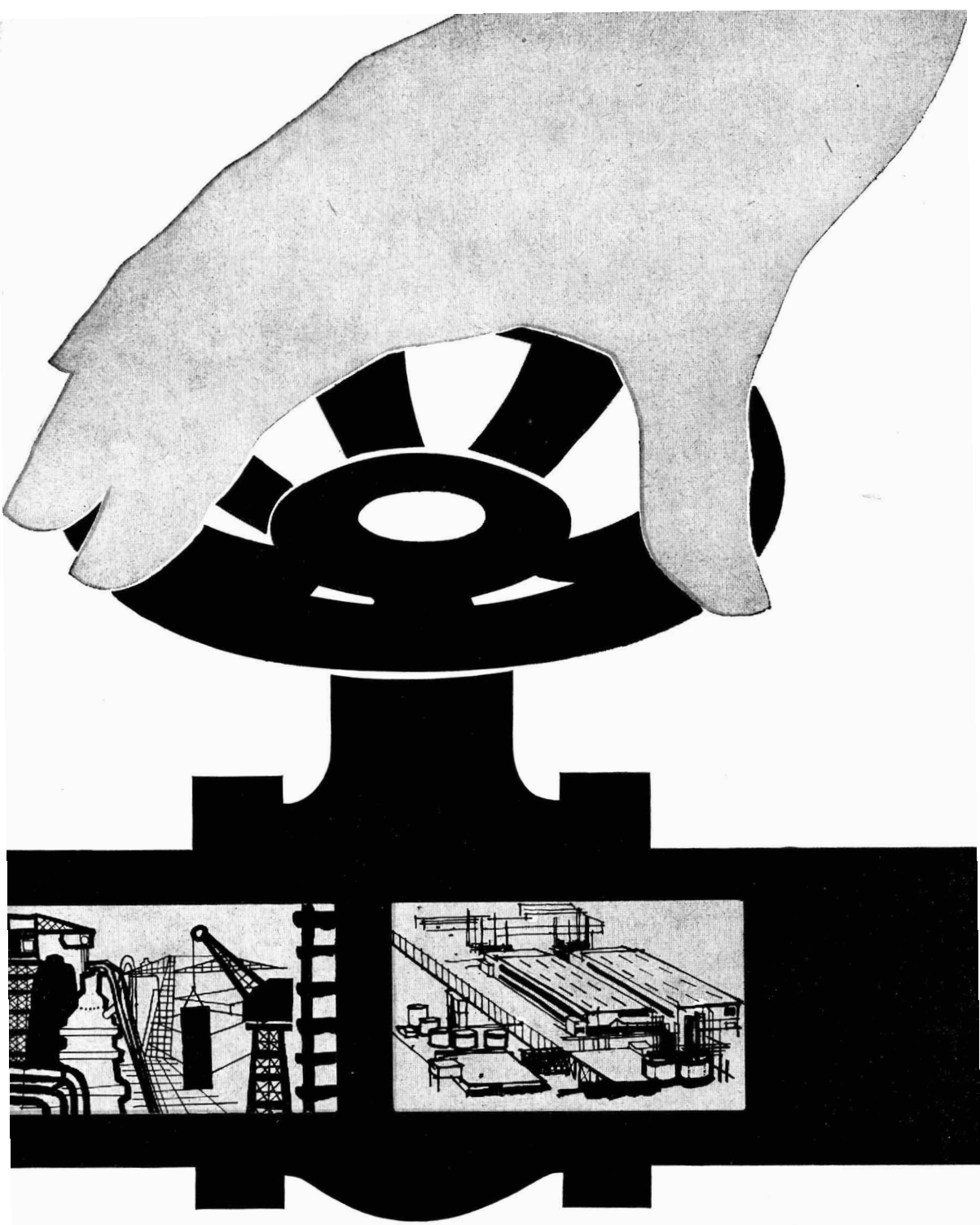

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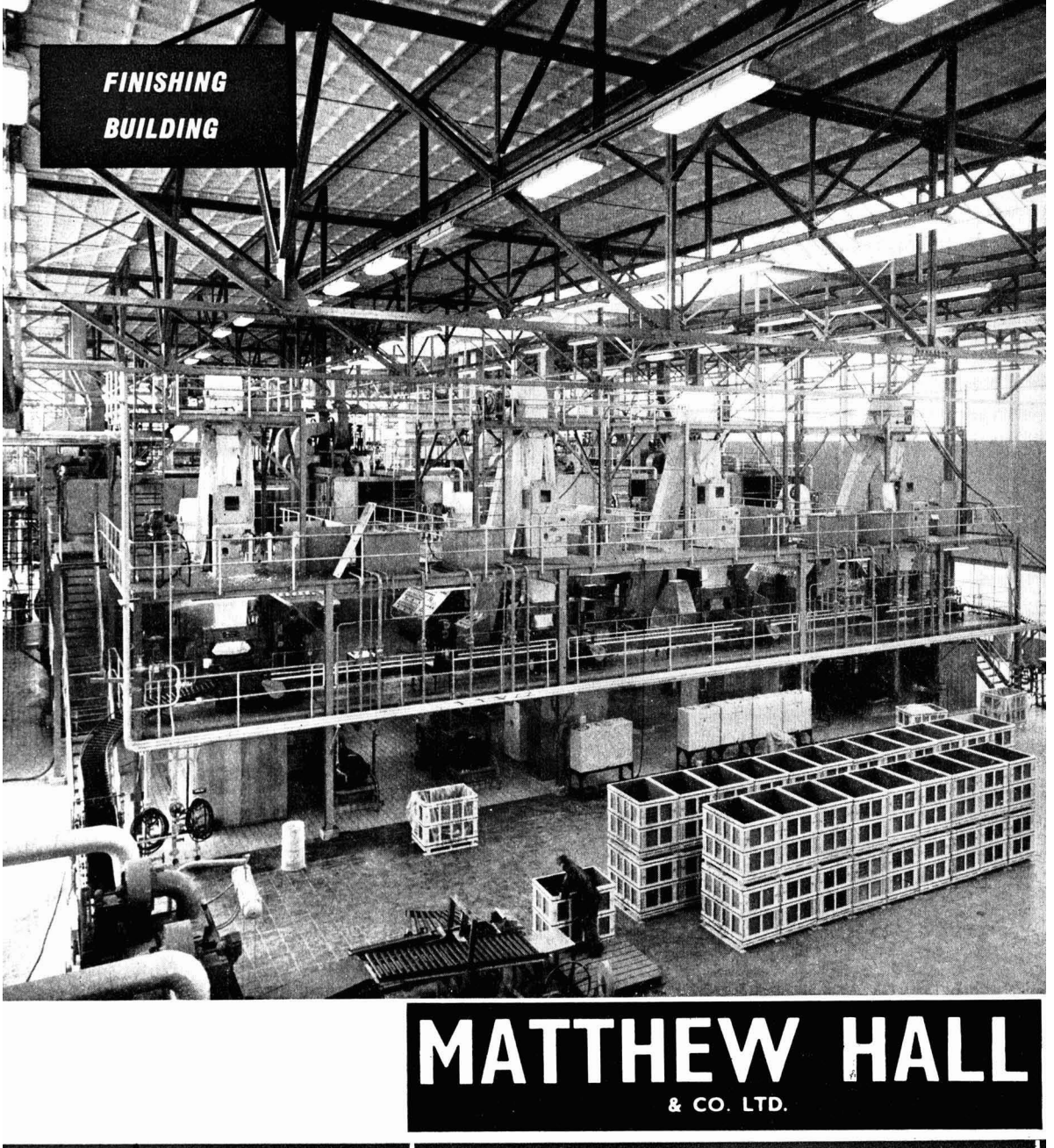

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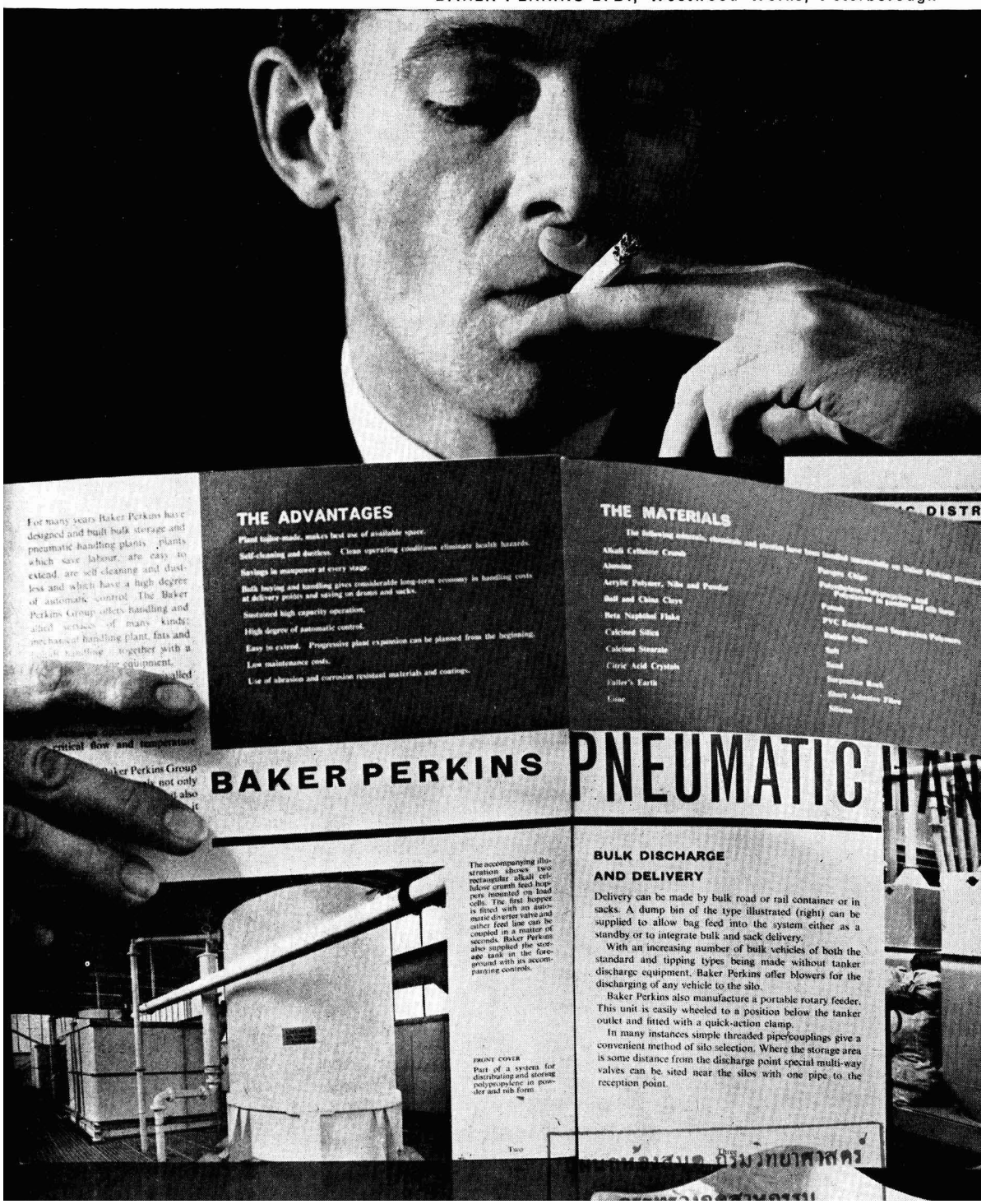

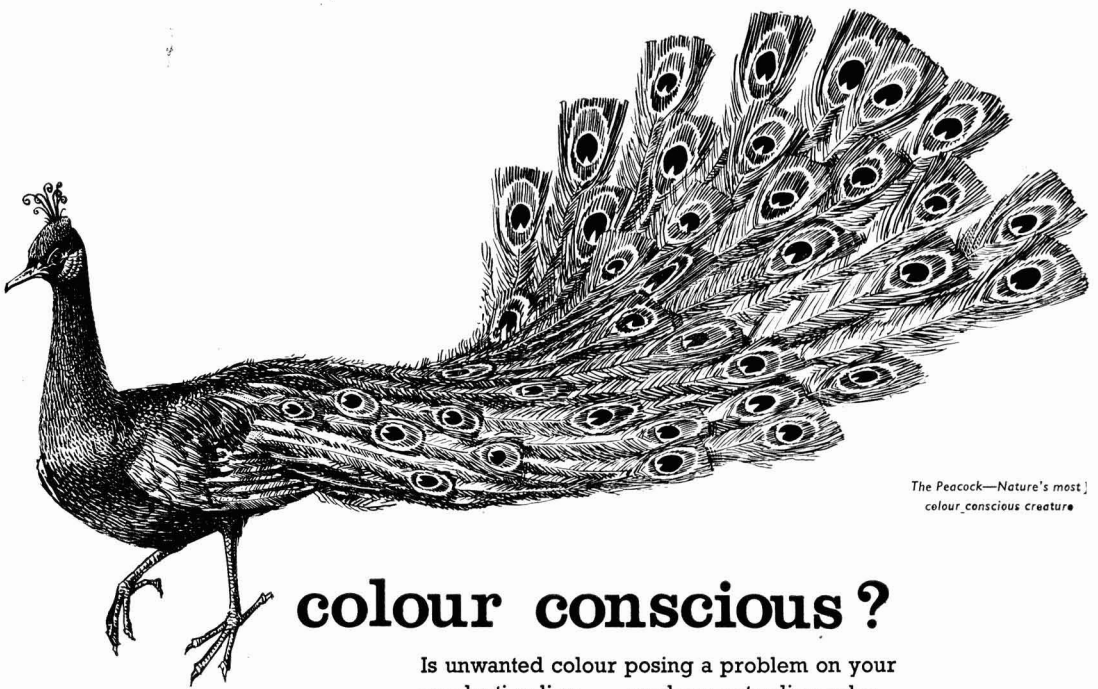

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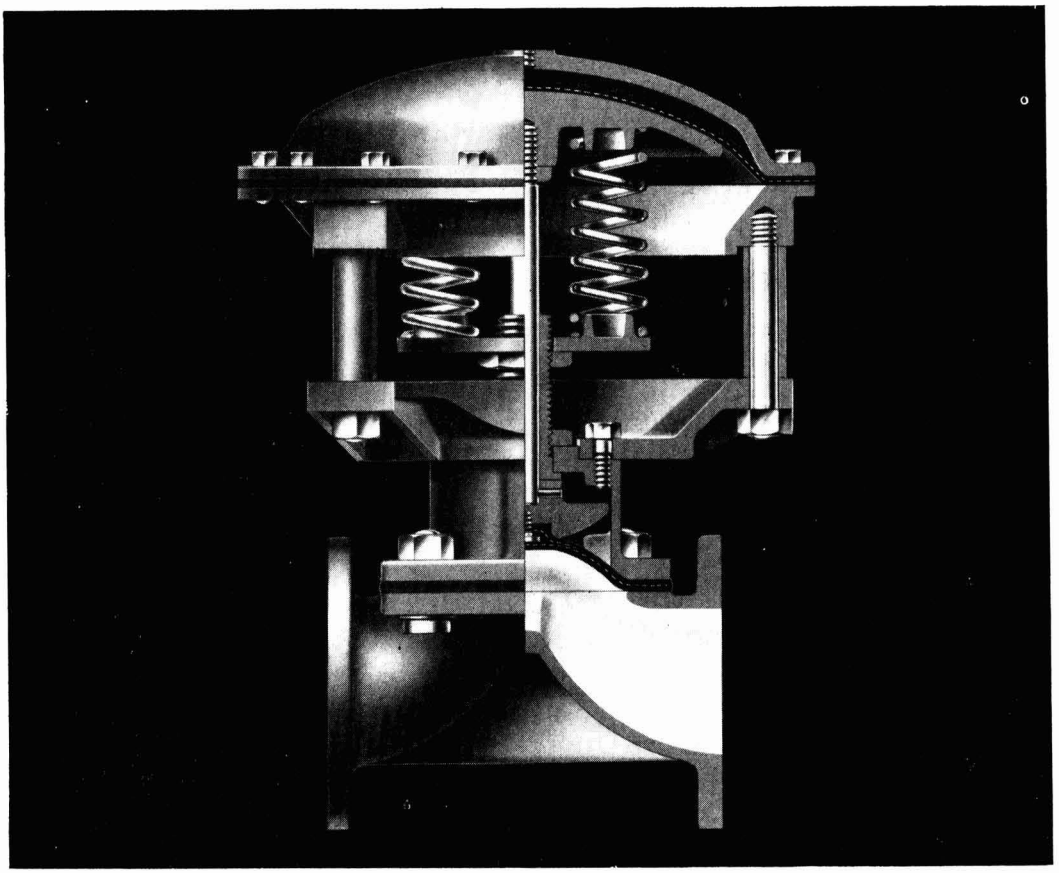

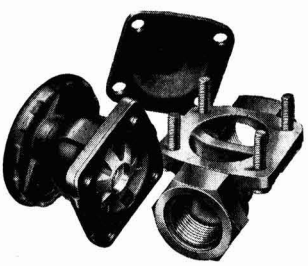

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TRENDS IN RUBBER

WHILE synthetic rubbers do not fully measure up to natural rubber, either because of their physical properties or because they are too expensive, the search for new synthetics will continue, and, indeed, the emergence of new elastomers is a regular occurrence. The popularity of different rubbers waxes and wanes as new ways of processing them are found and as new elastomers are developed.

A change in what is considered the best compound for one of the major applications of synthetic rubbers—that of passenger car tyres—is taking place at present. A strong swing in the next few months towards the use of polybutadiene as a replacement for SBR was forecast by G. R. Vila, president of the U.S. Rubber Co. at the annual meeting of the International Institute of Synthetic Rubber Producers in Brussels recently. He said that major decisions have been taken by U.S. tyre manufacturers in the last few weeks and they would soon change polymers and compounds to improve tread wear and other qualities. The tyre industry appears to have reached the point, at least for the time being, where it has fully exploited the opportunities to improve the properties of SBR by compounding techniques.

Advantages claimed for polybutadiene are improved wear in actual experiences over a year, exceedingly good groove cracking resistance, availability of polybutadiene in sizeable quantities and a close enough competitive price with SBR after oil extension. As reported in CHEMICAL AGE last week (p. 818), the development of a new carbon black now makes it possible to compound 100% polybutadiene.

Another elastomer which is felt by many to have a definite future in rubber products, including tyres, is ethylene propylene rubber. It has long been recognised that a saturated rubber would be inherently resistant to deterioration, but it has been necessary to accept unsaturation in general purpose rubbers to provide a base for vulcanisation with sulphur and accelerators. However, the development of new peroxides has provided a practical cross-linking route which is applicable to saturated hydrocarbon polymers. The great disadvantage of EPR is that it is not compatible with natural rubber or any other of the major types of synthetic rubber, but its big advantage is that it can be produced from low cost raw materials which are readily available. At present it appears that EPR might ultimately be produced in quantity at a somewhat lower cost than SBR.

Meanwhile butyl rubber producers also expect a major outlet for their product to be in the field of high quality motor tyres. Again, the main difficulty with butyl is its incompatibility with other rubbers, but it is hoped that research, for instance, along the lines of the development of chlorinated derivatives, will overcome this difficulty.

Another speaker at the annual meeting of the I.S.R.P., Dr. Baumann, drew attention to the growing importance of masterbatches. These products account for 50% of the entire production of SBR in the U.S. based on SBR content.

Whatever the choice of rubber for a particular application at a given time, it is agreed that the proportion of synthetics as a whole to natural

(Continued on page 854)

Fisons expect current year's trading profits to drop a third

A FALL of more than a third in their group trading profit for the year ending 30 June is expected by the directors of Fisons Ltd. In an interim statement, with nearly 11 months of the year gone, the directors look for a reduction of rather more than £1.25 million from the 1960-61 trading profit of £3,606,811.

The profit reduction is mainly due to a fall in sales of compound fertilisers in the present year which, it is believed, is in line with the general experience. In Fisons' cases this has been accentuated by the exceptionally high level of fertiliser sales at special discount prices in May and June 1961 for use in the current season.

The 1962/63 price list will reflect price reductions and will take account of progressive efficiency in production and distribution as well as anticipated increased sales in the coming season in keeping with the increased fertiliser usage that is confidently expected. The directors add that a considerable loss was sustained during reorganisation of the group's food interests following acquisition of the firm of Pickering and West Ltd.

The interim dividend is unchanged at 4%, but the directors state that there will be a modest reduction in the final dividend. The 1960/61 final of 7% made a total distribution of 11%.

I.C.I., Shell and Fisons announce substantial cuts in farm fertiliser prices

SUBSTANTIAL cuts in the prices of their farm fertilisers were announced this week by I.C.I., Shell Chemical Co. and Fisons. All three firms are to make the reductions on 1 June—a month earlier than in previous years and they are to change the basis on which prices to farmers will be quoted. In future they will be sold on a 'delivered farm' basis as against the previous 'delivered nearest railway station', which has meant in the past that the farmer has often had to pay an average of 8s 6d/ton extra.

In addition, I.C.I. are adding to their range a new compound fertiliser said to be specially suitable for autumn-grown cereals.

I.C.I.'s price cuts are the third in consecutive years and represent an estimated saving to the farming industry of nearly £1 million in the 1962-63 season. They have been made despite increased costs of wages and services, according to a statement issued on Monday, and have been made possible by more efficient production and distribution and by anticipating savings resulting from the coming into production of new ammonia plants. The spring, 1963, prices are reduced compared with those of March-May 1962 by 10s to 11s/ton, depending upon analysis. Nitro-Chalk 21 is down by 15s/ton and sulphate of ammonia manufactured by members of the B.S.A.F. by 8s 6d/ton.

The new compound fertiliser for autumn-sown cereals will have an analysis of 10% N, 20% P_2O_5, 20% K_2O and will be named I.C.I. No. 3. The existing compound fertilisers have been renamed, C.C.F. (12:12:18) becoming I.C.I. No. 1 and High-N C.F. (15:10:10) becoming I.C.I. No. 4. Nitro-chalk 15.5 will no longer be produced.

Shell Chemical, who gave the first indication of the changes in a statement issued towards the end of last week, subsequently told CHEMICAL AGE that Nitra-Shell would be reduced by 16s 6d/ton, No. 1 Compound by 13s 6d and No. 2 Compound by 14s. As with the I.C.I. materials, rebates will again be given for early delivery of certain grades.

Fisons state that their Fisons 51 compound fertiliser is to be reduced in price by 20s/ton, making it £32/ton before subsidy. All other fertilisers in their range will be reduced by varying amounts and all will be subject to a rebate of 30s/ton for delivery in June.

Oil duty

Manufacturers penalised

'Imported resins attract import duty either on an *ad valorem* basis or by incurring Excise Duty for hydrocarbon oils and pay which ever may be the higher. In the majority of cases the hydrocarbon oil duty (being higher) is paid but the domestic manufacturer is also obliged to pay the same hydrocarbon oil duty so that in effect the imported synthetic resins are in the main admitted duty free.

The Chancellor of the Exchequer has a strong case for the rectification of this anomaly under consideration and it is to be hoped that at long last some action will result in an amelioration of the difficulties arising from the U.K. manufacturers being penalised in the industrial usage of hydrocarbon oils.'—G. S. Bache, chairman of Reichhold Chemicals, in his annual statement.

U.K. and C.M. agree on cuts in chemical duties

UNDER the new bilateral tariff agreement between the U.K. and the Common Market, reductions have been made in both U.K. and C.M. external tariffs on a number of chemicals. The new rates represent a 20% reduction in most cases.

The changes in the U.K. tariff will be brought into effect in one stage as soon as practicable. The new rates of U.K. duty include the following (with tariff item numbers in brackets):

	New rate	*Existing rate*
	%	%
Certain inorganic acids and oxygen compounds on non-metals (28.13)	25	33⅓
Iron oxides & hydroxides (28.23)	16	20
Germanium dioxide (28.28)	20	25
2:2-Di-(p-hydroxyphenyl)propane (29.06)	25	33⅓
Acetone (29.13)	25	33⅓
Sorbic acid, acrylic acid, propionic acid (29.14)	25	33⅓
Glycine & triethanolamine (29.23)	25	33⅓
Caffeine & theobromine (29.42)	20	33⅓
Ammonium nitrate	16	20
	Per ton	*Per ton*
Other N fertilisers, excluding calcium cyanamide; calcium nitrate; sodium nitrate, natural; ammonium sulphate (reagent quality); urea (31.02)	£3 4 0	£4 0 0
Superphosphates	14	17½
Other phosphatic (31.03)	8	10
Other fertilisers in prepared form (31.05):		
Ammonium nitrate	16	20
Superphosphates	14	17½
Activated carbon (not of animal origin) (38.03)	25	33⅓
Transparent wrapping (39.03)	16	20
Synthetic rubbef, inc. latex, other than factice-from-oils (40.02)	8	10

Trends in rubber

(*Continued from page 853*)

rubber will continue to increase. Dr. Baumann estimates that by 1965 Western demand for rubber is likely to reach the 4.2 million tonnes mark and that the ratio of natural to synthetic rubber will probably be 40% to 60%. Relative consumption in the U.S. in 1965 is expected to be 22% natural to 78% synthetic. At the beginning of 1962 the West's capacity for synthetic rubber was approximately 2.9 million tonnes and by 1965 plans called for an enlarged capacity of about 3.75 million tonnes. The following table gives the breakdown in tonnes.

	1962 (April)	1965	Increase
SBR	2,175,000	2,500,000	325,000
Butyl	220,000	320,000	100,000
Stereos	145,000	460,000	315,000
Others	360,000	470,000	110,000
	2,900,000	3,750,000	850,000

New address for Esso International

Esso International Inc. have changed their address to 15 West 51st Street, New York 19, N.Y.

Project News

Parsons Power-Gas get BP Belfast refinery contract

CONTRACT for process units of the new £8 million Belfast refinery of **British Petroleum Co. Ltd.** has been awarded to **Parsons Power-Gas Ltd.**, London. Jetty contractors are Charles Brand and Co. Ltd. Contractors for off-site facilities and tankage have yet to be named; Irish Roads (Belfast) Ltd., are handling temporary roads and preliminary site work, while West's Piling and Construction are carrying out all piling work.

This is the first new U.K. refinery contract to be awarded to a contracting company with its roots in Britain. Parsons Power-Gas are a joint venture between the Power-Gas Corporation Ltd., one of the Davy Ashmore group, and Ralph M. Parsons of Los Angeles. The company will handle engineering, procurement and construction. Commissioning is scheduled for early 1964; throughput will be 1.3 million tons of crude a year.

I.C.I. Wilton EO plant switching to propylene oxide

● WORK on the conversion of the ethylene oxide plant of the **I.C.I. Heavy Organic Chemicals Division** at Wilton to propylene oxide is nearing completion and the plant should be commissioned during the summer. Propylene oxide will be made by the chlorhydrin process and ethylene oxide manufacture will be switched to Severnside, where the new plants, based on the Scientific Design air oxidation process are now undergoing commissioning trials.

Recently a new 150-ft. flare stack was erected for the propylene oxide unit. Designed by the H.O.C. Division engineering department, it has been fabricated in mild steel with the top 15 ft. in stainless steel to make it heat resistant.

Glyceral triacetate plant for Howards of Canada

● PRODUCTION of glyceryl triacetate has now been started at Cornwall, Ont., by **Howards and Sons (Canada) Ltd.**, one of the Laporte Industries Group, using Canadian-made glycerine and acetic anhydride to produce triacetin. Howards are now exploiting the 600,000 lb./year market in Canada which has previously been supplied by imports. Among firms being supplied are two that use glyceryl triacetate as a plasticiser for cigarette filter tips; main use is as a plasticiser for cellulose acetate.

Crewe gas output raised 80% with Esso feedstock

● A NEW MS reforming plant at the Crewe Works of the **North Western Gas Board** has become operational with 2.2 million cu. ft. day output. Main contractors were the **Woodall-Duckham Construction Co. Ltd.** The new plant, which uses primary flash distillate (PFD) supplied by Esso Petroleum Co. Ltd. as feedstock, has raised capacity at Crewe by some 80% or 10,000 therms/day. PRD is piped to Liverpool from Esso's Milford Haven refinery and transported by road tanker to Crewe. The new plant is automatic and requires only one man per shift to control the complete installation. So far, the gas produced is said to have contained virtually no naphthalene.

Kellogg contract for new CEPSA hydrodesulphurisation unit

● IT is announced that **Kellogg International Corporation** have been awarded a contract for the design, engineering and procurement of materials for a new 10,000 to 13,000 b.p.s.d. gas, oil and kerosene hydrodesulphurisation unit which is to be erected at the Teneriffe refinery of **Compania Espanola de Petroleos S.A. (CEPSA).** In addition, Kellogg will supervise the construction and initial operation of the unit, which will be built by CEPSA using mainly local manpower.

Completion is scheduled for the autumn of 1963.

Electronic oil blender at Regent's Portslade depot

● EUROPE'S first electronic fuel oil blender has started operating at the Portslade (Sussex) depot of the **Regent Oil Co. Ltd.** It blends oils of any intermediate viscosity from light and heavy base stocks and means that fewer refined grades have to be transported—either to the U.K. from producing areas overseas or from British refineries. The Autoblender plant, supplied and installed by **Automatic Control Engineering Ltd.**, London, has a volumetric accuracy of better than plus or minus 0.5%.

Cyclohexene plant for Texaco

● A CYCLOHEXANE plant will be built by **Texaco Inc.** in Trinidad with an annual capacity in excess of 8 million Imp. galls., it was announced by **Trinoil (U.K.) Ltd.** The new plan, which will supply extra-high purity cyclohexane for world wide chemical markets, will go on stream by mid-1963.

Texaco's new plant, which will also produce finished benzene and toluene, will use a company-developed process involving the catalytic hydrogenation of benzene.

Swedish contract for Newalls Insulation

● IT was announced at the British exhibition in Stockholm that **Newalls Insulation Co. Ltd.** will supply all the thermal insulation materials required in the Esso petrochemical plant to be built at Stenungsund (see CHEMICAL AGE, 20 August 1960, p. 290). This is the largest quantity of insulation material ever supplied for a single contract in Sweden.

Among the Newalls materials to be used will be Newtherm calcium silicate and a recently developed polyurethane, Newallite. The Newtherm, which withstands temperatures up to 760°C, will be used to insulate the hot plant and Newallite the cold.

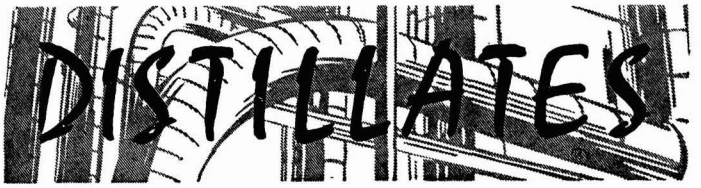
Whessoe secure big tank order for I.C.I.s North Tees unit

● A CONTRACT worth almost £250,000 has been awarded to **Whessoe Ltd.**, of Darlington, by the Kellogg International Corporation for the supply and erection of 15 tanks at the new **I.C.I.** crude oil distillation plant for the production of hydrocarbon feedstocks which is located on I.C.I.'s North Tees site.

Work on the site has now commenced. It includes the erection of three 128-ft. diameter Horton floating-roof tanks and two 112-ft. diameter cone-roof tanks.

Shell move detergents in collapsible tanks

Shell Chemical are now using collapsible tanks, with mobile pumping and metering equipment, to transport liquid detergents products between Stanlow and their distributors, J. Eversbed and Son Ltd., 240 miles away at Shareham.



A GLITTERING champagne party at the Savoy Hotel, London on Monday marked the centenary of Victor Blagden and Co. Ltd., whose 100 years of progress were recounted in this journal last week. The guests who represented all sectors of the chemical industry, including many of its leading personalities, were received by A. J. Lush, chairman, and his managing director, Rolf Stein.

With 100 years in coal tar derivatives, Blagden's are one of the pioneers of the modern British chemical industry and while still very much active in that field, they are now expanding into more specialised and sophisticated chemicals. One recent new venture is in polyols; if the company can offer the technical service that is vital in this expanding sector, they should be assured of a big share of the polyurethane foam market.

Although CHEMICAL AGE cannot claim to be as long established as Blagden's, there has always been a close connection between the Blagden and Benn families. When the late Sir Ernest Benn had the foresight to start CHEMICAL AGE at the start of the modern chemical industry, just after the first world war, it was natural that he should consult his friend, Victor Blagden.

LONDON can justly claim to be the world's most important centre for oil refinery contracting. Contracts currently in hand and those recently completed by London-based companies represent well over £100 million. The latest addition, disclosed exclusively in 'Project news' this week, is the contract awarded to Parsons Power-Gas to build the process units for new BP refinery at Belfast. Recently I revealed that Bechtel International of London would be main contractors for Regent Refining's £30 million Milford Haven refinery.

The following is a run-down of other contracts still in hand:

Caltex in Frankfurt (with Kellogg International Corporation as main contractors); East African Oil Refineries (BP Shell) at Mombasa with Procon (Great Britain) Ltd., to build; Gulf Oil in Denmark (Kellogg); Gulf Oil in Holland (Kellogg); I.C.I. Tees-side (Kellogg); Iberica Refineries of Spain (Lummus); Istanbul Petroi (Kellogg); Mobil, Shell and BP in Turkey (Foster Wheeler Ltd.); Pakistani consortium (Kellogg); Shell in New Zealand (Bechtel); South African Petroleum Refineries (Shell/BP) at Durban (Foster Wheeler).

To that impressive list should be added refineries just completed, including BP expansion at Dinslaken (Kellogg); Shell at Singapore (Lummus); and Dansk-Veedol in Denmark (Foster Wheeler) as well as others. I have omitted expansions to existing refineries which include several major projects: BP Isle of Grain (Matthew Hall and Wimpey); Mobil at Coryton (Kellogg); Iranian Oil at Abadan (Fluor Engineering and Construction Co. Ltd.) and a host of others.

IN SPITE of the swing towards synthetic rubbers that has been going on for some time, Dunlop still have faith in the future of natural rubber—so much so that they plan to establish another plantation in Nigeria, and to replant steadily in Malaya. The company say that the development of a practical cis-polyisoprene would presage an era of extreme competitiveness between natural and synthetic materials. Price would determine which was used, provided they could be interchanged in production, but, say Dunlop, it should not be assumed too readily that victory in a price war would go to synthetic rubber. This, of course, may be true, but the fact still remains that most of the increasing demand for rubber is likely to be met by synthetics (see p. 853).

Dunlop, however, are not neglecting to develop their synthetic rubber production. They have solved problems in the manufacture of trans-polyisoprene (synthetic gutta percha) in a pilot plant and are now building a full scale plant.

THE news that Pozzi, the large Italian industrial group, believed to be financed by the Italian Church, have just received a licence for the Vianova water-based paint systems will be received with trepidation by other paint groups in Italy. Up till the present E.V.I., owned by FIAT, are the only company in Italy who have held such a licence and that has been for their own use as a dipping primer for motor cars. Pozzi, who are only new in paints, have already launched a gigantic sales campaign in the decorative field.

Water based paints are being used in considerable quantity in Europe, mainly by the licensees of Vianova, Peter Stoll in Austria and Valentines in France being particularly active.

Over the last two years British Resin Products have also spent a considerable amount of money on development and advertising in this field and it is believed that some of their customers both in England and in Europe are getting results which justify putting these products up to the paint user with confidence.

Several car companies in England have carried out trials with water based primers but for dipping primers the big worry is flash off. At least one user in Europe has overcome this by the construction of special ovens which take into account the high latent heat of evaporation of water.

HAVING just experienced two fires at their Fawley refinery within the space of three days, I feel that at the present moment anyone quoting the saying to an Esso executive about lightning never striking twice in the same place would be likely to get only a very hollow laugh, if that. In fact, he'd probably reply that misfortunes frequently come in threes. Certainly they have for Esso, for last Friday there was a further outbreak, in their partly constructed office block in Westminster.

Luckily, the second fire at Fawley, which also broke out last Friday night—this time in a heat exchanger on which maintenance was being completed—did not, it seems, damage it sufficiently to prevent restarting during the weekend as originally planned. The earlier blaze, in a catalytic cracker (CHEMICAL AGE, 19 May 1962, p. 806), was much more serious. It is not yet known exactly how much damage was done but one thing is fairly certain—it will be some time before the unit is again operational.

FOLLOWING the recent disclosure that the new titanium oxide venture at Majave, Cal., of American Potash and Chemical and Po Laporte Industries, would use the new chloride route, there is much speculation as to whether this process will also be adopted at the new Western Australia oxide plant of Laporte Titanium (Australia) Pty. Ltd.

News that the chloride route would be used at Mojave was contained in the annual report of American Potash and Chemical, who will own 85% of the venture. I gather that Laporte have had the chloride process under development at Stallingborough for some time and that the two firms have equal right to the process. They are reported in U.S. journals to have broadened their agreement to cover titanium oxide production in countries other than the U.K. and the U.S.

In the chloride process, titanium oxide is chlorinated to the tetrachloride and then oxidised to reform the dioxide. In the sulphate route, ilmenite ore is digested in sulphuric acid, forming titanyl sulphate; this is hydrolysed to the dioxide.

Alembic

LORD FLECK OPENS MARCHON ACID PLANT

General view of the new sulphuric acid plant which is part of the current Marchon expansion scheme. The large circular tower in the foreground is the converter

£2 m. project boosts acid and detergent phosphates production

NEW sulphuric acid plant of Marchon Products Ltd., opened by Lord Fleck on Wednesday, 23 May, raises capacity from 100,000 to over 170,000 tons/year. This is one of several integrated plants which hinge on the company's anhydrite mine and which have cost over £2 million and taken two years to construct. Main contractors for the project were Marchon's engineering department.

Most of the acid made is used in the production of detergent phosphates and as a co-product Marchon now make 170,000 tons of cement a year which is all sold to the Cement Marketing Co. Ltd. for distribution in the north-west and in Scotland.

The increase in acid production has been achieved by building a third kiln that is fed with anhydrite from the company's mine and shale from the Marchon quarry, both of which are adjacent to the plant. A third contact acid plant has also been built producing sulphur trioxide and sulphuric acid from the gas stream from the kiln. The 230 ft. long kiln has an internal diameter of 11 ft. 2 in., with the firing end expanded to 12 ft. 6 in.

Acid is made by the associated company, Solway Chemicals Ltd. The works, now covering 100 acres of a 250-acre site, has been built on a virtually inexhaustible deposit of anhydrite. Although the anhydrite route was chosen at a time of a world suphur shortage and sulphur is now freely available at cheaper prices, the economics of the original plant were so favourable that to meet the rapidly increasing needs of the company's phosphate plant, Marchon did not hesitate to base their acid expansion plans on the same process.

Economics of the route benefit from on-the-spot anhydrite and ability to make full use of the co-product cement. Part of the anhydrite output is sold for fertiliser manufacture; 2 million tons or so have already been extracted from the massive reserves beneath St. Bees Head.

About 20% of the current annual U.K. production of sulphuric acid (some 2.6 million tons) is made from anhydrite. Production and consumption of acid in the U.K. have shown an annual increase of about 4% over the past 50 years. Annual production of cement is expanding at much the same rate, but the actual tonnage is over 13 million tons/year.

Phosphate rock is imported in the company's three ships from North Africa; these are the recently commissioned *Marchon Enterprise* and *Marchon Venture* and the flagship *Marchon Trader*.

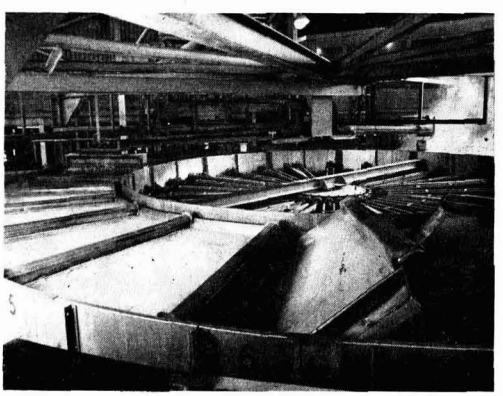
Greater part of Marchon's production of 175,000 tons of sulphuric acid a year is used in producing sodium tripolyphosphate, which forms at least one-third by weight of almost all powder synthetic detergents. The Marchon tripolyphosphate plant, working on the 'wet' system from crude phosphoric acid, is the largest of its kind in Europe.

The engineering department of Marchon Products carried out much of the design and construction work on the new project. Major sub-contractors were :

Lurgi Apparatebau GmbH and Lurgi GmbH, gas cleaning and acid plant design;
W.V. Zinn and Associates, consulting engineers;
Polysius Ltd., kiln and ancillaries;
Tileman and Co. Ltd., part of civil engineering work;
Cementation Ltd., piling;
James Howden and Sons Ltd., blowers;
Williams Openshaw Ltd., lead work;
Distington Engineering Co. Ltd., steel towers, converter shell and steel precipitators;
Simon Carves Ltd. and W. C. Holmes and Co. Ltd., electrostatic precipitators for effluent gas purification;
Crompton, Parkinson Ltd., electric motors;
Oxley Engineering Co. Ltd., sulphuric acid tanks;
Barry Henry and Cook Ltd., cement bulk loading system;
Pegson Ltd., raw material handling system;
Ancorite Ltd., acid resistant brickwork;
William Kenyon and Sons (Thermal Insulations) Ltd., insulation work.

Marchon Products were founded by Frank Schon and Fred Marzillier in 1939

(Continued on page 858)



After the reaction between phosphate rock and sulphuric acid the slurry is pumped to a Prayon filter. The new Prayon filter at Marchon is as large as any built for this purpose

N.R.D.C. STILL WANT LICENSEES FOR ACETYLENE PROCESS

THE National Research Development Corporation are continuing their attempts to secure industrial licensees or partners for their process for the manufacture of acetylene from methane by partial oxidation, on which development work was suspended last year (CHEMICAL AGE, 23 December 1961, p. 997). Dr. B. J. A. Bard, a member of the corporation, said recently that intensive efforts had been made and were continuing and that there were hopes that some, at least, of the techniques which had been worked out would eventually find practical application.

Patent protection has been applied for both for the burner wall system evolved to inhibit carbon deposition and for the design of the combustion tubes, which are said to permit an extremely rapid rate of gas throughput.

If the process itself does not find full favour, it is thought that some return on its cost to date may still be forthcoming eventually through the adoption of one or other, or both, of these features in plants for existing partial oxidation systems.

The practical utilisation of the N.R.D.C. process, which is a development of the original Sachsse process (now known as the B.A.S.F. process), continues to depend largely on the outcome of the present competition between acetylene and ethylene as the starting material for many organic syntheses. As Dr. Bard said: "Although, by our process, we have been able to demonstrate up to 25% improvement in acetylene yield with a 12% to 15% economic advantage, we were told that the latter would have to be of the order of 25% before companies would consider it a worthwhile business proposition on which to spend the substantial sums of money necessary for scaling up to a commercial plant. Plants today are using larger burners so that the Nardac size burner (½ ton a day approximately) would have to be expanded in throughput 20- or even 30-fold during the development phase."

Dr. Bard was contributing to the discussion following the reading of a paper on the process to members of the Chemical Engineering Group of the Society of Chemical Industry. It was the first time the techniques had been disclosed, except in negotiations with possible licensees.

To enable the methane and oxygen to mix at the highest possible temperature short of that which produces the reaction, the N.R.D.C. team have used a special design of heater which avoids local heat spots and stagnation pockets and thus prevents the breakdown of the methane to carbon and hydrogen, which would cause pre-ignition. Filters, without which pre-ignition occurred at 500° to 600°C, have also been incorporated in the hot gas stream. These precautions, in conjunction with a mixing chamber of multi-tubular design, have resulted in the prevention of pre-ignition with a preheat temperature of 850°C.

To avoid carbon deposition on the walls of the combustion chamber and at the same time prevent quenching of the reacting gas mixture due to radiation to a cold surface—which would result in high oxygen consumption and low acetylene yield—the N.R.D.C. burner has been provided with graded porous refractory walls lined with a suitable gas-permeable material through which superheated steam is passed. This serves to strip off the carbon as it is formed and keeps the temperature at over 1,000°C.

New attack on market for water treatment units

IN a bid to capture a share of the expanding overseas market for sea-water conversion plants, a new Anglo-American venture has been set up with headquarters in London under the name of Aqua-Chem International Ltd.

Equal joint owners of the new company are Aqua-Chem Inc., Waukesha, U.S., Motherwell Bridge and Engineering Co. Ltd., Marshall Sons and Co. Ltd., and Motherwell Bridge Contracting and Trading Co. Ltd.

Land-based long tube flash evaporator units will be made at the U.K. works of Marshall and Motherwell Bridge; erection will be undertaken by Motherwell Bridge Contracting, who are based at Beirut.

Main markets are expected to be in the Mediterranean area and the Near East; work is already in hand on sea-water conversion plants for Cyprus and Malta (see also 'People in the News').

Opening of Marchon sulphuric acid plant

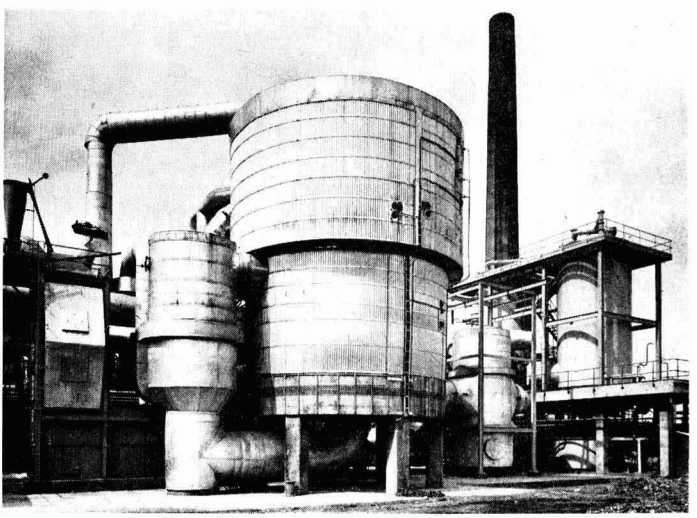
(*Continued from page 857*)

and began the marketing of chemicals from a London office. This was bombed in 1940, and a year later production of surface active materials was started in Cumberland. A move to the site of a disused coke-oven near Whitehaven was made in 1943. From their first production of sulphated fatty alcohols, Marchon progressed to the production of complete household detergents based on sulphonated dodecyl benzene.

By 1949 the company had a labour force of some 400 and the basic pattern for future growth had become clearly established. Marchon, who until then had bought in semi-manufactured detergent chemicals, now set out to provide basic raw materials for synthetic detergents, directing growth back towards raw materials. They became producers of fatty alcohols and of detergent phosphates.

The common interests of Marchon and Albright and Wilson in phosphates led to the company's joining the A. and W. group in 1955.

Mr. Schon, now aged 50, and a member of the Albright and Wilson main board, has come a long way from the early 1930's when he was working on the commercial side of a company connected with the earliest development of detergents in Germany and Central Europe.



General view of third kiln and sulphuric acid plant

Purchasing manager criticises lack of attention given to buying from Common Market countries

THE almost complete lack of attention to the future problems of buying from the Common Market countries compared with that given to the efforts needed to sell to them was strongly criticised by Mr. C. F. Huebner (purchasing manager, British Oxygen Co. Ltd.) in a speech in London on 17 May. Mr. Huebner, who was delivering a paper on the purchasing of chemicals in the Common Market, at a special one-day meeting of the Purchasing Officers' Association attended by some 80 buyers in the chemical industry, said: "I feel this attitude to sell with all the power and glory on the Continent without buying is a very bad policy indeed and I think it is up to the buying fraternity to get up and find out what is to be had.

"You will never find it sitting behind a desk," he added. "If managements are reluctant to allow buyers to move around, then the buyer must sell the proposition that it is an essential element in modern commerce. Unless you get after these things and get the benefit for your organisation, somebody else will step in and take the bargains from you."

Earlier, Mr. Huebner had likened the opening up of the Western European market to the buyer to the coming of the supermarket as opposed to the village store.

Whereas formerly the buyer had been confined in general to purchasing his chemicals within the U.K., with the Common Market he would have opening up for him a supermarket of colossal size. "In shopping for chemicals in Europe, the buyer must get to know his market as the housewife has to know her supermarkets and similar stores. Out of his market he has to find the suppliers who will sell him the right quality at the right price and he must face up to the fact that this right price and quality are going to vary from time to time and from country to country."

This and the fact that demand in one country could suddenly use up available local surpluses of certain materials might mean the buyer having to look elsewhere for future supplies, which made it essential to keep up to date on new plants coming into operation, he said.

It was also necessary to keep fully abreast of prices, even though at the present time buyers were not always able to take advantage of these because of the imposition of K.I.D. "I think it necessary that you know all about the sources of supply and the current prices so as to avoid the possible link-up between chemical manufacturers here and on the Continent so that when greater freedom in marketing comes about you will not find yourself hamstrung by arrangements between these manufacturers," he declared.

"Under the Treaty of Rome it is forbidden to institute cartels and pricing agreements. In this country, in general, the Monopolies and Restrictive Practices Courts have ruled against all pricing arrangements with, I think, one notable exception, but you will be as aware as I am that this has not stopped what is otherwise known as price leadership where you have the wonderful effect of somebody changing a price today and within two or three days all the other people have followed suit. This is a danger which I see looming in the Common Market. You all know that Germany is very prone to price agreements among manufacturers and I am sure there will be leaders in suggesting arrangements with people in this country."

This, suggested Mr. Huebner, was why buyers must act now, make their studies and find their sources of supply "so that you will be in a position to play one off against the other should you find you are being held to ransom, say, in Germany, or should U.K. firms link up with firms in Italy."

It must also be remembered, Mr. Huebner said, that since the European market would be catering for a population of 250 million to 300 million people as against the market in the U.K. for 50 million people, while some giants would no doubt get together, all the countries would lend themselves to smaller firms being able to operate. Furthermore, one also had available as sources of supply countries behind the Iron Curtain.

"I do not want to advocate the great use of Iron Curtain countries," Mr. Huebner said, "but if you are going to find yourself held to ransom by Western European countries, then I think it is only fair game that you should use the Communist countries as your lever."

Mr. Huebner delivers his address

The two main sources of supply in the way of general chemicals in Europe would probably be Italy and Germany. France was also important, but manufacturing units there were smaller and more abundant and his impression was that they were "absolutely scared stiff" of American competition, which they preferred to describe as dumping.

"In all these countries, as you will find, there will be periods of plenty and periods of scarcity. They will sell to you if they think they will and get the few extra cents but, if all of a sudden demand arises in India or Brazil they have no compunction in just letting you sit on one side and making the best of a temporary price advantage in one of these other markets. On the other hand, tie them down as much as you can in your contract arrangements and, in general, they will honour it."

Commonwealth, E.E.C. and E.F.T.A. took 70% of U.K.'s £325 m. chemical exports

SOME 70% of U.K.'s £325 million of direct exports of chemicals in 1961 went to the Commonwealth, the European Economic Community and the European Free Trade Association—a proportion which was roughly similar to that of U.K. exports in general, Mr. Peter Thomas, M.P., Parliamentary Under Secretary of State to the Foreign Office, said in London on Tuesday.

Mr. Thomas, who was the principal speaker at the annual luncheon of the British Chemical and Dyestuffs Traders' Association, added that if the present negotiations in Brussels regarding the U.K.'s entry into the Common Market succeeded, she would have a total home market in future of more than 250 million people while the U.K. market itself would be wide open to European competition. On the ability of the chemical traders to meet the opportunities and challenges of such a situation depended not only their own fortunes, but also much of the ultimate fortune of the country as a whole.

The association's president, Mr. G. S. Bache (Reichhold Chemicals Ltd.), said in his reply that whether the U.K. entered the market or not, the association still had a vital role to play. He concluded by appealing to all members to give the maximum possible support to the executive council, who had their interests at heart.

NEW CHAIRMAN TAKES OVER AND REORGANISES R. AND J. DEMPSTER

FOLLOWING his acquisition of all the issued capital (£250,000) of R. and J. Dempster Ltd., chemical plant producers, Manchester, Mr. R. T. Newsham has taken over the chairmanship and reconstituted the board with Mr. L. J. L. Walker as deputy chairman. Mr. Charles Dempster, former chairman, has retired at the age of 80.

Under a comprehensive reorganisation, the company's activities have been divided into five groups, which have been further sub-divided into divisions. Each group director is represented on the new board.

The company designs, engineers, manufactures and constructs a wide variety of plant for the chemical, gas, coal, steel and allied industries including 'turnkey' projects. Process developments have been mainly in the coal gas field, but today many of the newer techniques are being increasingly used for general chemicals and petrochemicals.

Licences negotiated

Licences covering a number of these activities have been negotiated in recent years. Plants designed and fabricated by R. and J. Dempster include: Ammonia (conc., liquid, anhydrous and sulphate); benzole (absorption, washing, defronting, refining); tar (distillation, dehydration, tar acid recovery); purifiers (boxes, tower/tray; H_2S; Stretford process); liquid extraction (Lurgi process for separation of aromatics; extraction and recovery of tar acids and tar bases); carbon monoxide removal (Lurgi); general chemical and materials handling plant.

A research and development staff undertake the design of complete projects or individual plants. Well-equipped laboratories are available to study particular problems and to establish design data.

One of the company's specialised activities has always been the design and erection of gasholders; overseas some 46 holders with a capacity of more than 60 million cu. ft. have been erected by licensees.

Workshops cover 175,000 sq. ft. and are equipped for the fabrication in mild and stainless steels or aluminium of vessels, heat exchangers and pipework, as well as for undertaking linings and weldings.

The company was founded on its present site at Newton Heath, Manchester, in 1885 by the brothers Robert and John Dempster. The policy of research and investment in modern equipment adopted by them, has been carried on by John Dempster's son, Charles, who was a substantial shareholder, as well as chairman, prior to the recent sale. He has now retired from the board having recently celebrated his 80th birthday and 62 years with the company.

The new board will continue to concentrate on the existing activities, maintaining the same high level of service that has been provided for more than 75 years.

The directors and their responsibilities are now: R. T. Newsham, chairman L. J. L. Walker, deputy chairman; H. K. Skinner and M. Newsham, non-executive directors; W. Guest, financial director and company secretary; D. M. Robinson, assistant secretary; L. C. Dukoff-Gordon, group services director; W. E. Huggett, process and technical group director (technical sales, process and research divisions); T. N. Whitewell, gas, chemical and oil group (gasification chemical and oil divisions); F. Simonds, sales and commercial group (fabrication sales, spares and sub-contract sales, special contracts, gasholder sales, construction divisions); R. E. Baty, manufacturing group director (fabrication, spares and sub-contract and special contracts divisions); F. H. Bailey, gasholder and construction group (gasholder, construction, plant hire divisions).

Johnson's offer development DPA, 10 m. lb. plant on stream early 1963

DEVELOPMENT quantities of diphenolic acid (DPA) are now being offered by S. C. Johnson and Son Ltd., Frimley Green, Camberley, Surrey, from pilot plant production by their U.S. parent, S. C. Johnson and Son Inc. The announcement, made last week, follows the disclosure recently of plans by the U.S. company to begin manufacturing in bulk in a new 10 million lb./year facility now being constructed for them by the Badger Co. (formerly Badger Manufacturing) at Waxdale, Wisconsin.

The plant, which will also be able to produce from 5 million to 6 million lb. of DPA derivatives, is due to come into operation early next year, from which date production quantities will also be offered in the U.K.

The cost of this new venture (Johnson's first into the chemical field) has not been disclosed but it is believed that the final expenditure on the new plant cannot be much less than $5 million. If the demand for DPA warrants it, Johnson's may eventually go into production in this country as well.

Diphenolic acid, which Johnson's expect to find wide application as a resin for flexographic, letterpress and offset inks, overprint varnishes and flushed colours, was discovered by the research and development department of the U.S. company while seeking new materials for improved floor polishes in 1954. It was recognised immediately as a versatile chemical with a wide range of potential uses and no time was lost in applying for patents and developing a series of derivatives. Pilot-plant operation, at the rate of 250,000 lb./year, began in 1958, since when a commercially feasible full-scale production process based on levulinic acid as raw material has been established.

In the process, phenol is reacted with levulinic acid with hydrochloric acid plus a catalyst. The reaction, controlled by temperature and time, results in gradual appearance of diphenolic acid crystals. The crystals are recovered from the reaction mass with a "crude" centrifuge, the bulk of the unreacted raw material separating out. Decolourisation and deodorisation are accomplished with a stripping column, after which the crystals are redissolved and recrystallised and passed through a second centrifuge. The DPA is then dried, screened and packaged.

Technically, diphenolic acid is 4, 4-*bis* (4-hydroxyphenyl) pantanoic acid, γ, γ-*bis* (4-hydroxyphenyl) valeric acid (molecular weight 286.31). In appearance it is a white granular product, melting point 170°C minimum.

Diphenolic acid is soluble in acetic acid, acetone, ethanol, ethyl acetate, isopropanol, methyl ethyl ketone and hot water. It is insoluble in benzene, carbon tetrachloride, *n*-hexane, water and xylene and only partially soluble in ethyl ether.

Its eight reactive sites are said to permit a wide range of chemical modifications and it is claimed that it will undergo readily all the expected reactions common to phenolic hydroxyl groups and ortho ring positions, leaving the carboxyl group free for further reaction.

Resins developed for inks are alkyd phenol-formaldehyde derivatives for can coatings, DPA polyamide resins for flexographic inks, and co-esters, phenolic resin and drying oil combinations for offset and letterpress inks. The company say the can coating resins offer greater chemical resistance than epoxy, oleoresinous, phenolic and butadiene-based materials.

Letter to the Editor

N.A.B.S. record

SIR, A few weeks ago CHEMICAL AGE reported that the response to my 1961/62 presidential appeal for the National Advertising Benevolent Society was approaching £40,000. The appeal is now closed, within sight of the £50,000 mark, having reached £48,532, an all-time record. Will you allow me please to repeat a most heart-felt "Thank you" to your readers who so kindly sent me cheques.

Yours etc.,
GLANVILL BENN.

British fair in Stockholm

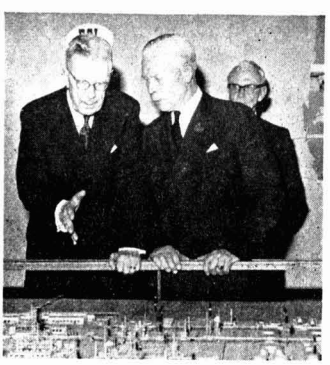
U.K. CHEMICAL AND PLASTICS COMPANIES WELL REPRESENTED

THE British fair in Stockholm has already created a very favourable impression, and orders are beginning to come in. In his opening speech on 18 May, Mr. Tage Erlander, the Swedish Prime Minister, spoke of the fair as a manifestation of power, vitality and versatility of one of the world's leading industrial nations. King Gustav Adolf spent three hours looking at exhibits and seemed impressed by the Distillers and I.C.I. stands at which he spent some time.

Although almost all types of industry are represented, there is a predominance in the central area of such items as chemicals, steel and engineering products. Among the chemical firms exhibiting are Albright and Wilson, A. Boake Roberts, British Hydrocarbon Chemicals, British Oxygen Co., W. J. Bush, Distillers, I.C.I. and Shell.

As one of the most outstanding features of the British economic scene, plastics are playing a large part in the fair. Production in the plastics field has risen from 150,000 tons in 1950 to 610,000 tons in 1961. At present the U.K. holds fourth place in terms of tonnage production and the range of products which are manufactured are among the widest in the world. Major tonnage materials include polythene (125,000 tons), p.v.c. (109,000 tons), polystyrene (51,000 tons) and thermosetting materials (214,000 tons). In addition, the U.K. is one of the world's major exporting countries. Outside the Commonwealth, Sweden is the best customer, importing some 12,000 tons during 1961.

Sweden is also one of the U.K.'s best customers for salt. I.C.I. Alkali Division alone ships many thousand of tons to Sweden every year. The salt is used primarily as a raw material for the production of chlorine and caustic soda in the pulp and paper industry. Substantial tonnages of soda ash are also supplied by Alkali Division for Sweden's glass industry.



H.M. King Gustav inspects the model of Grangemouth works of B.H.C., shown on the Distillers stand

Queen Louise being shown Melinex, a solid form of Terylene, by Dr. A. Caress of I.C.I.

I.C.I. also export considerable quantities of heavy organic chemicals to Sweden, amounting to millions of kroner annually, a figure which is steadily increasing. Bulk storage depots have been positioned at strategic points in Scandinavia such as Malmo and Copenhagen to ensure that customers get prompt and efficient deliveries. These depots themselves are replenished by large-tonnage consignments brought by special chemical tankers direct from I.C.I. plants on Tees-side.

Lower chemical profits for British Celanese

ALTHOUGH the range of chemicals offered by British Celanese Ltd. continued to increase, the year to 31 March was a difficult one for the industry, reports Mr. C. F. Kearton, chairman, in his annual report. Selling prices were under severe pressure in many directions and the sum total of the year's efforts, which included improved efficiencies in some manufacturing processes, was that profits were slightly down on 1960-61.

The B.C.L. plastics division also had a setback in profits, partly due to lower selling prices, particularly overseas, and partly due to development expenses. Additional manufacturing facilities are being provided.

Sales by weight of Dicel acetate were up 28%, while sales by weight of Tricel yarns and staples rose by 42%. (See also 'Commercial news').

Dunlop plan third C.M. adhesives plant

RECENT decision of the German Dunlop company to produce industrial adhesives brings the number of Common Market firms manufacturing Dunlop adhesives to three. Production has been established in France and Holland for a number of years and in Italy another organisation is soon to start manufacture under licence. The German site will be at Hanau-am-Main.

The German company has drawn on the technical know-how and experience of Dunlop Chemical Products Division in the U.K. The division's Chester Road plant in Birmingham is one of Britain's largest producers of industrial adhesives, synthetic resin emulsions and latices. Dunlop also make adhesives in Japan, India, Australia, New Zealand and South Africa.

Increased capacity and competition leads to deferment of Reichhold development

INCREASED capacity in the chemical field and the growth of competition from Europe have again resulted in the directors of Reichhold Chemicals Ltd. deciding to defer plans for the development of the Brockhampton site, says the chairman, Mr. G. S. Bache, in his statement to shareholders circulated with the 1961 directors' report and accounts. However, it is felt by the board that the competition is now showing signs of levelling out and a progressive improvement is expected during the rest of this year.

Of the group's subsidiaries during 1961, Mr. Bache indicates that Beck, Koller and Co. (England) Ltd. possibly suffered most from the competition, coupled with the effects of the credit squeeze. Both showed themselves particularly in the last quarter—the latter resulting in an increase in bad debts—and at the same time it became necessary to re-catalyse as well as to replace some part of the phthalic anhydride plant. Consequently there was an appreciable fall in the tonnage of phthalic anhydride produced in the latter part of the year.

Bad weather, delays in the delivery of some parts of the plant and teething troubles prevented the new alkyd resin plant at Speke from coming on stream until early October. The new capacity, however, is expected to enable the company to cut production costs and to assist materially in increasing efficiency and economic working.

Vinatex Ltd. completed their movement from Carshalton to Havant during the year and steps have been taken to broaden their activities by the conclusion of an agreement with the Rexall Drug and Chemical Corporation for the distribution of their resinous polymers in the U.K. At present these include polystyrene and polythene. At a later date polypropylene will be added to the range.

Plastics industry policy must hinge on securing adequate return on capital—DR. SWALLOW

FUTURE purpose of the U.K. plastics industry must primarily be that of ensuring an adequate return on investment in order to support a high level of research and development of new products and the construction of new plants, was the view expressed by Dr. J. C. Swallow (chairman of I.C.I. Plastics Division) in a paper entitled 'How will plastics grow?' presented at the fourth biennial conference of the British Plastics Federation in Torquay last week.

It was unlikely that we could maintain our present position as a producer of just under 9% of the world's total plastics output if it continued to depend on the natural growth of existing products, he said. By 1965, the U.K. share of the world output would probably have fallen to just over 7%, a trend brought about by the increasingly prominent contribution by hitherto under-developed countries. Policy for the future of the industry must be shaped around these changing factors.

As regards raw materials, Dr. Swallow said, new and improved processes were required to put U.K. manufacturers on an equal footing with others who, in some respects, had already made substantial beneficial changes. There must also be a solid concentration on the manufacture of products in which U.K. manufacturers had clear technical advantages and the industry should not be afraid to seek know-how abroad where such action could be beneficial.

Other needs, as Dr. Swallow saw them, were a really conscious effort to offer a commercially viable range of specialised and completely new products which would match up to the requirements of modern industry and a critical examination of the plastics industry's position in export markets.

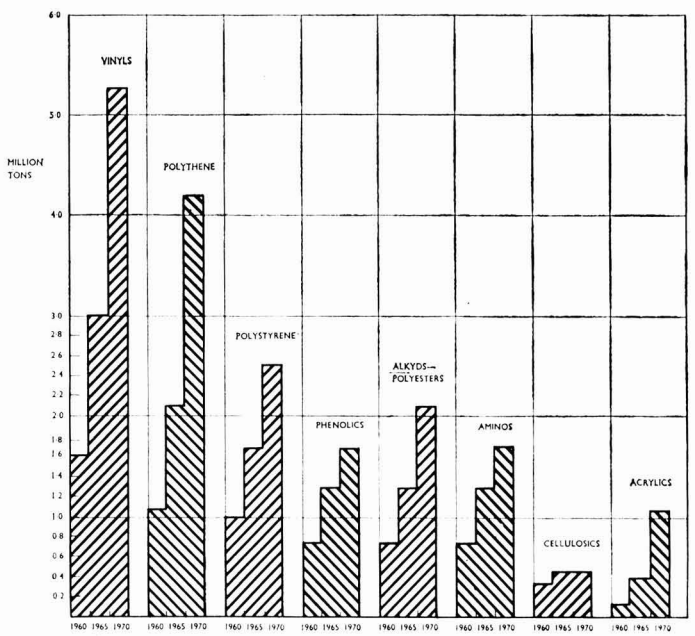
On the former, he said the increasing demand for tailored variations of existing products to suit specific purposes, often involving only small quantities, reduced the effective capacity of the plant and increased costs. Research must therefore be given an outstanding role to play, firstly in devising new polymers and secondly in supporting plant operations so as to ensure as high a rate of output as possible.

"If one allows an expenditure on research and development equivalent to 3% of turnover, then the polymer and semi-fabricated products manufacturers in this country should now be spending about £5 million a year on this work. In addition, there might be as much as £1 million a year spent on research and development by machinery manufacturers, producers of ancillary chemicals, and raw materials, fabricators and processors in support of the primary products industry," he declared.

On the future of the plastics industry generally, Dr. Swallow said it was probable that world production would rise to between 12 million and 13 million tons by 1965 and to about 20 million tons by 1970 compared with a figure of more than 7 million tons in 1961. The shares of output now taken by 'developed' countries would fall proportionately as the smaller producers became more prominent, with the shift largely in favour of Japan, the U.S.S.R., Eastern Europe, India and those western countries which were more favourably placed with regard to raw materials.

In the absence of a new large-tonnage polymer, the present group, comprising the vinyls, polyolefins and styrene based polymers were likely to continue to constitute well over 50% of the total plastics output. The years 1965 and 1970 were likely to see production of vinyls reaching 3 million and 5¼ million tons respectively, while polythene output might pass the 2 million ton mark in 1965 and achieve double that figure in 1970. Polystyrene and other copolymers (except synthetic rubber) might grow to over 1½ million tons in 1965 and to 2½ million tons in 1970.

The industry would also see rapid increases in the production of polypropylene, acrylate and methacrylate polymers, unsaturated polyesters and specialised high-duty products, Dr. Swallow said. "We may expect phenolics, aminoplastics and cellulosics to increase at a less rapid rate and, in the case of cellulosics, there may even be a trend towards falling production."



Estimated future world growth of individual plastics

New large-tonnage plastics?

On the other hand, the discovery of some new potentially cheap large-tonnage material and its rate of exploitation, either slow or fast, could have a profound effect on the forecast trend. The growth of the plastics industry during the last 20 years had been conditioned and organised around the discovery and commercialisation of p.v.c., polystyrene, polythene and, more recently, polypropylene, but there was a reasonable chance that within the next 10 years at least one new large-tonnage material would be introduced. "It may well be that one of the present small-scale new products such as polyformaldehyde or polycarbonates will fill this role, but it is too soon to say whether this will be so or whether an as yet undiscovered product will emerge," Dr. Swallow said. "In all probability such a product would be based on cheap raw materials derived from oil rather than coal and would be a straight-chain structure rather than one based on the benzene ring."

Fawley construction workers on strike

About 450 contract workers employed at the Esso refinery at Fawley are on strike because they say the names of six shop stewards were included in a redundancy list issued by the employers, Matthew Hall and Co. An Esso spokesman said: "This dispute will not affect production as the men were carrying out only miscellaneous construction work".

Overseas News

New German fluorocarbon plant planned for mid-1963

THE middle of 1963 is to see the economic-scale operation of a new aerosol-gas plant at Bad Wimpfen, Federal Germany. The plant, with a planned annual capacity of 5,000 tonnes of fluorocarbons, to be sold by Kali-Chemie AG, Hanover, under their Kaltron trade-mark, is being built there by the operating concern, Saline Ludwigshalle AG.

The opening of the Bad Wimpfen plant will raise West German national capacity of fluorocarbons by 25% to some 25,000 tonnes/year. The compounds, to be produced under a licence granted by Allied Chemical, U.S., to Kali-Chemie and passed on to the Ludwigshalle concern, will be used not only in aerosols but also as refrigerants. Until production starts next year, Kali-Chemie will distribute Allied Chemical products.

Union Carbide cut some polythene prices

Union Carbide Plastics Co. have announced reductions in the prices of wire and cable grade polythene. Cuts vary from ½ cent to 5½ cents a lb. depending on the type of material, but for most grades it is 2½ cents a lb. The major competitors for cable and wire grade compounds, Du Pont, Monsanto and U.S. Industrial Chemicals, will remain competitive. The price cuts are backdated to 1 May. Union Carbide make 33 different types of wire and cable grade materials.

D.S.M. near completion of low pressure polythene plant

Construction of a 10,000-t.p.a. low-pressure polythene plant by Staatsmijnen, of Limburg (Dutch State Mines), is nearing completion. The necessary ethylene will be supplied by a light-fraction cracking unit brought into operation by D.S.M. last year. At the same time as the polythene plant is ready for production, a start will be made on the preparation of mixtures of this polythene type and the high-pressure polythene produced in the 25,000 tonnes/year plant opened last year by Staatsmijnen.

Cyanamid Italia to build new pesticides factory

Cyanamid Italia, of Rome, are to spend something over 300 million lire on the building of a manufacturing plant for pesticides. The company is also this year to open its new antibiotics plant, which has been stated as demanding a total investment of 1,000 million lire from start to finish.

Pozzi outline Ferrandina petrochemical scheme

In their 1961 annual report, the Ceramica Pozzi concern, of Milan, Italy, give the capacities of the natural gas-based petrochemical plant they are building at Ferrandina as 40,000 tonnes/year of polyvinyl chloride, 30,000 tonnes/year of methanol, 30,000 tonnes/year of caustic soda and 26,000 tonnes/year of chlorine for their own use.

Goodyear Tire and Rubber Co., of the U.S., are to aid in the building of a p.v.c. plastics plant, while Badische Anilin- und Soda-Fabrik AG have given Pozzi a licence to produce acetylene from natural gas.

The Ferrandina project is expected to cost some 30,000 million lire altogether.

Esso's oil and chemical talks in India

Esso Standard Eastern believe that a 200,000 ton olefin plant would be more economical than the 100,000-ton/year capacity authorised by the Indian Government; Esso have stated a preference not to have State participation in this project.

The company are prepared to consider merging their marketing organisation with an Indian-registered refinery company and to invite Indian participation in the equity. Refinery capacity is likely to be increased above the present 2 million tons/year figure.

Continental Oil to build olefins plant

Continental Oil plan to build a semi-commercial plant for the production of straight-chain α-olefins, adjacent to their recently opened long straight-chain alcohols plant at Lake Charles, La. The α-olefins produced in the 5 million-lb. unit will be used primarily for market development purposes. Cononco engineers have already begun construction of the plant which is scheduled for completion by the end of the year.

Modified Henkel terephthalate process allows for recovery of potassium salt

THE Japanese company Nippon Shokubai Kagaku Kogyo Co. Ltd. aim to cut the cost of terephthalic acid production by the economic recovery of the potassium salt. The process is a modification of the Henkel process, by which potassium phthalate, produced from phthalic anhydride or phthalic acid, is isomerised to potassium terephthalate.

The process, the subject of a patent SMO. 35-17484, is carried out in two steps. Monopotassium phthalate is added to an aqueous solution of dipotassium terephthalate. Monopotassium terephthalate and dipotassium phthalate are produced on heating. Either phthalic anhydride or phthalic acid are then added to the monopotassium terephthalate which is converted to terephthalic acid and monopotassium phthalate on heating.

The monopotassium phthalate produced in the second stage is recycled for use in the first reaction, while the dipotassium phthalate produced in the first stage is converted to terephthalic acid by isomerisation.

Nippon Shokubai Kagaku Kogyo have also developed a process for the production of terephthalic acid by the direct oxidation of *p*-xylene (see CHEMICAL AGE, 10 March 1962, p. 405).

New sulphuric acid plant comes on stream in Austria

Production began recently at the new sulphuric acid plant of Donau Chemie AG of Austria, which has a capacity of 80 tonnes a day but which will eventually be increased to 125 tonnes a day. Donau, who produce about 30,000 tonnes of sulphuric acid a year, account for one sixth of Austria's total output. Output from this latest venture will make Austria self-sufficient in sulphuric acid for superphosphate manufacture. Most of Donau's sulphuric acid goes to Krems-Chemie, Glanzstoffabrik and Lenzig.

Rumania offers chemical licences to the West

The Rumanian foreign trade organisation Chimimport, Bucharest, is now reported to be offering both to Communist-bloc and other countries licences for the use of Rumanian inventions and processes in the chemical field.

Pakistan fertiliser plant now on stream

President Ayub Khan of Pakistan, inaugurated a Rs.246 million natural gas fertiliser factory at Fenchuganj, in East Pakistan. The factory—Pakistan Industrial Development Corporation's biggest project—is based on Sylhet natural gas and has an annual production capacity of 117,000 tons of urea.

Poland starts new units for methanol, ethyl acetate

Operation has started at the Oswiecim chemical combine in Poland of two new production plants, one for methanol, the other for ethyl acetate.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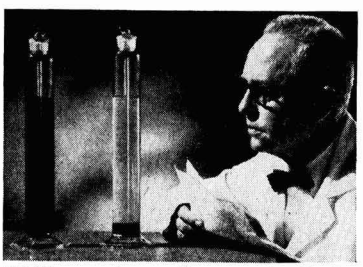

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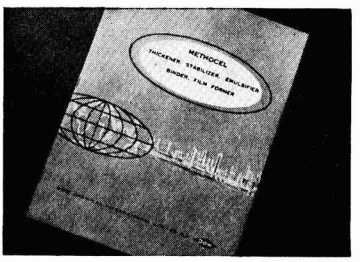

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DOW

Overseas news

F.A.O. fertiliser experts plan nitrogen plant for Burma

SPECIFIC proposals for the construction of a nitrogen fertiliser plant in the Chauk natural gas field in Upper Burma, some 400 miles from Rangoon on the Irrawaddy, have been made by three Soviet fertiliser experts who have just completed a six months' assignment to Burma on behalf of the U.N. Food and Agriculture Organisation. They say that a dramatic rise in the country's food production can be achieved by higher usage of nitrogen fertilisers and that self-sufficiency in fertiliser production could be one of the best ways of effecting increased usage.

The three experts, all from the U.S.S.R. Scientific Research Institute for Nitrogen, state that Burma has no fertiliser units; 15,000 tons of ammonium sulphate and 10,000 tons of ammonium phosphate are currently imported. Bonemeal is produced for fertiliser usage.

Under Burma's second four-year plan, fertiliser usage is to rise to an annual total of 130,000 tons by 1966. The Soviet plan is that the new plant should be built in two stages with a target output of 133,000 tons of fertiliser; it could begin operating in three to five years. Capital investment would be some $43 million.

Refinery expansion planned in Tanganyika and Lebanon

E.N.I., the Italian State oil corporation, are to start discussions with the Tanganyikan Government for the establishment of a £4 million oil refinery with a throughput of 500,000 tons of oil/year. This would meet the needs of the country's whole market.

In the Lebanon, the Iraq Petroleum Co. Ltd. plan to invest a further £2.3 million to cover expansion of their Tripoli refinery and to add new plant for the production of high-grade petrol, jet fuel and butane.

Change of name for Badger

Badger Manufacturing Co. have decided to change their name to Badger Co. Inc. The reason behind the decision is that for many years the company has been doing more engineering and construction business, particularly in the chemical and petroleum industries, than manufacturing.

Du Pont plan new chlor/alkali complex in Argentina

Ducilo S.A.I.C., an Argentine subsidiary of E. I. du Pont de Nemours Co., state that facilities for the production of caustic soda, vinyl chloride, trichloroethylene and perchloroethylene are foreseen in a plan for a chemical complex that has just been laid before the Argentine Government. The project, founding of which now depends on the granting of permission by the national authorities, will be based on local natural gas reserves and salt.

Currently the Argentine has capacity for about half of the national requirement for 80,000 tons/year of caustic soda. Compania Industrial de Alcalcis SA (49%) and Pittsburgh Plate Glass International SA (51%) are planning a plant at San Antonio Oeste with sufficient capacity to meet all Argentina's needs for soda ash, plus caustic soda.

Berre butadiene plant will employ new process

Plans for a butadiene plant with a minimum capacity of 37,000 tons a year have been announced by Société des Elastomeres de Synthese S.A. The plant, to be built at Berre, near Marseilles, will employ a process now being developed by Shell, who have a 32% interest in the company. No details are available as yet except that it will involve butane dehydrogenation to butadiene through what is described as an entirely new chemical route.

Work is also expected to begin shortly at Berre on the construction of a polybutadiene plant. No indication has been given as to the cost of either unit.

Petrochemical projects planned for Greece

The Greek Ministry of Industry states in Athens that petrochemical facilities are foreseen as part of an oil refinery-steelworks joint project planned to be launched in Greece. The project is among a number of industrial plans laid by Greek and foreign interests before the Greek Government as bases for a further industrialisation of the country.

France increases exports of organic chemicals

French exports of organic chemicals have considerably increased in the last five years, in spite of strong foreign competition:

	1957	1961
	Tonnes	
Methanol	73	21,759
Butyl rubber	—	8,592
Phthalic anhydride	2,120	2,805
Butyl phthalates	4	1,101
Octyl phthalates	47	2,772
Ethylene oxide	348	524
Monoethylene glycol	21	3,293
Diethylene glycol	182	1,767
Ethanolamines	813	2,420
Sulphonamides	175	197
Vitamins	256	337
Alkaloids	161	175
Antibiotics	85	151

During this five-year period, prices have fallen considerably and these exports were made mainly to countries outside the Franc zone. Customs statistics indicate that in 1961 about NF386 millions worth of the above products were to non-Franc zone countries, compared with NF14 million to the Franc zone.

S.D. ethylene oxide process for Japanese firm?

The Japanese company Nippon Soda are to build a 12,000-tonne-a-year ethylene oxide plant. They wish to use the air oxidation process of Scientific Design but a technique has already been developed by Nippon Shokubai Kagaku Kogyo, and the Ministry of International Trade and Industry are still considering whether the domestic process should be given priority. The data submitted by Nippon Soda and Nippon Skokubai are under consideration.

Dominion tar to close original coal tar works

The original manufacturing operation of Dominion Tar and Chemical Co. Ltd., at Sydney, Nova Scotia, is closing down within six to eight weeks. It is a coal tar works which was started by a predecessor company in 1903. Dominion Tar say the plant is being shut down because available supplies of raw coal tar are unsteady. It will not be relocated since adequate supplies of coal tar derivatives are available from other company plants in Canada.

Cyanamid to search for natural gas in Canada

Cyanamid of Canada Ltd. have formed a new company, Oxford Natural Products Ltd., at Ontario, to conduct drilling operations for natural gas in Southwestern Ontario, near Beachville. Beachville is near London, Ontario, and Cyanamid have a plant there where limestone is quarried and processed.

Asahi export fibre technique to Italy

A contract has been signed between Asahi Chemical Industry Co. and the Italian firm A.N.I.C., whereby Japanese know-how for the production of Cashmilon acrylic fibre will be used by the Italian company. In addition to granting the use of patent rights, the Japanese company will supply engineering services and technical information for the construction and operation of the plant.

A.N.I.C. plan to build a plant with a capacity of 5,000 tonnes a year. Until it comes on stream they will import the fibre from Japan for market development purposes.

Ammonium sulphate plant for the Philippines

Marinduque Iron Mines Agents, Inc., Philippines, are due to start the construction of their fertiliser plant in Iligan City next month. The plant, designed to produce 485 tons of ammonium sulphate a day, will require a capital investment of US$12 million, plus 21 million pesos in counterpart funds for local installation costs. The fertiliser plant should be completed early in 1964.

PEOPLE in the news

● **Mr. F. S. Clark,** engineering manager and a director of Laporte Titanium Ltd., has left this country for Bunbury, Western Australia, where he will supervise erection of the £3½ million (A£4 million) titanium oxide plant of Laporte Titanium (Australia) Pty. Ltd. Mr. Clark made his initial visit to the site last year. This time he will remain to see the plant on stream and is likely to be at Bunbury for about two years. Mr. Clark will relinquish his appointment as engineering manager, Battery Works, Stallingborough, but will continue as a director of Laporte Titanium Ltd. and to act as engineering manager of the company as a whole. **Mr. A. C. Perrins** has been appointed engineering manager, Battery Works, Stallingborough, and will continue to act as deputy to Mr. Clark as engineering manager of Laporte Titanium Ltd.

● **Mr. G. S. Taylor** has resigned from the board of Gas Purification and Chemical Co. and their subsidiary companies.

● **Mr. C. S. Dingley** has retired from the Trustees of the Plastics Industry Education Fund after 10 years' service, including seven years as chairman. He has been succeeded by **Dr. W. Blakey,** deputy chairman, British Industrial Plastics, Ltd.

● **Mr. F. L. Atkinson** has been appointed manager of Pumpire Ltd., and **Mr. H. Mitchell,** technical representative of the hoist division of Goodenough Pumps Ltd., both members of the Goodenough engineering group.

● **Mr. A. H. Geil,** at present director of the Du Pont Dutch subsidiary Du Pont de Nemours (Nederland) NV, will on 1 August take up a directorship of the parent company, E. I. Du Pont de Nemours and Co., Wilmington, Del. He will replace **Mr. W. L. Scarborough,** who will succeed him in Holland.

S. O. A. Thomas, general manager, Chemical Engineering Construction Ltd. (see C.A. last week, p. 821)

● **Mr. Edwin H. Beaumont,** sales director of the industrial adhesives division of Evode Ltd., Stafford, and a director of Evomastics Ltd., left recently on an extensive business visit of Canada and the U.S. The tour will include a visit to the Union Paste Co. of Boston, who manufacture Evode products under licence.

● **Dr. Jose A. Daunas,** assistant director of medical research for Cyanamid International, has been appointed to the board of directors of Medico, the voluntary relief agency founded in 1958 and now working in 12 countries.

● **Mr. L. C. Cartwright,** of Foster D. Snell, consulting chemists and engineers, New York, is being sent, under the U.N. technical assistance programme, to Suakin, Sudan, for six months to advise on the operation of the Red Sea shore plant there producing domestic salt by evaporation.

● **Dr. Jürg G. Engi** has been voted to the board of administration of the Chemische Fabrik Schweizerhall, chemical producers, Basle, Switzerland.

● Directors of the newly set up Aqua-Chem International Ltd., London (see p. 858) are: **Mr. A. R. Miller, Mr. F. D. Masterton, Mr. D. A. Polkinhorne, Mr. Walter Kohring, Mr. F. A. Loebel, Mr. G. F. Leitner, Mr. C. A. Howe, Mr. E. Burgess** and **Mr. H. I. Ashqar.**

● **Mr. H. J. Hornsby,** general sales manager of the International Synthetic Rubber Co. Ltd., Hythe, has been elected president of the International Institute of Synthetic Rubber Producers.

● **Mr. R. P. Marshall** has been appointed to the new post of technical manager created as part of the continued expansion programme in the field of tungsten, molybdenum and tantalum manufacture and fabrication of the Tungsten Manufacturing Co. (1958) Ltd., Portslade, Brighton. Mr. Marshall has been chief chemical engineer with Semiconductors Ltd. since 1957 and before that was manager of the atomic energy division of Impregnated Diamond Products, working on uranium and thorium powder metallurgy.

● I.B.M. United Kingdom Ltd. have announced the appointment of **Mr. F. Clarke** as country industry co-ordinator for the chemical industry. Mr. Clarke joined I.B.M. in 1957 and has so far worked in the company's Newcastle branch as a data processing salesman, where his principal accounts have been in the chemical industry.

● **Mr. Peter Lloyd** has been appointed the first technical service manager of Durapipe and Fittings Ltd., Winnock Road, West Drayton, Middx, in order to provide customers with improved technical assistance. Mr. Lloyd, who is 29, joined the company last year as assistant to the technical director, after four years' research work on the coating and lamination of textiles and the development of foam-backed plastics.

● **Mr. J. C. Gridley,** chairman of the Mobil Oil Co. Ltd., has been elected president of the Institute of Petroleum in succession to **Mr. Julian M. Leonard,** managing director of Carless, Capel and Leonard Ltd.

● **Mr. C. W. Robertson,** director of Nederlandse Dow, the Dutch subsidiary of Dow Chemical, has been made general director of Dow in Holland.

● **Professor Dr. D. W. van Krevelen,** a director of Algemene Kunstzijde Unie N.V., and **Mr. J. K. Rauwerda, Ir.,** have both been elected to the board of the Dutch concern Koninklijke Nederlandse Gist en Spiritusfabriek.

● **Mr. John G. Window,** sales director of Q.V.F. Ltd., chemical engineers in glass, Stoke-on-Trent, flew from London on 21 May to start a seven-weeks' tour of Central and South America. He recently returned from a visit to Japan and Korea.

● **Major-General L. O. Lyne** has been appointed chairman of Manchester Oil Refinery (Holdings) Ltd. in succession to **Mr. R. E. F. de Trafford,** who has resigned from the position but remains on the board.

● **Mr. Frank H. Smith** has been appointed general manager of the new Dunlop Consumer Products Group, embracing seven companies, divisions and their associates, including Dunlop Chemical Products Division and Semtex Ltd.

● Following the recent acquisition of Cromford Colour by Burrell and Co. Ltd., **Mr. J. C. Key,** managing director of Cromford is to receive £5,000 compensation from Cromford on relinquishing his office. **Mr. S. Key,** his brother and a non-executive director, is also retiring. Two Burrell directors are to be appointed to the board.

● **Dr. M. A. Phillips** last week returned from a visit to the U.S., where in New York he appeared as a witness for Merck in the Merck-Aries case on amprolium. While in the U.S. he signed, on behalf of Dr. M. A. Phillips and Associates, a consultancy contract with the Nopco Chemical Co.

U.K. trade with Germany

DETAILS now issued in Germany of the decreased chemical trade volumes between the Federal Republic and the U.K. last year (see CHEMICAL AGE, 21 April 1962) show that West German chemical exports to the U.K. dropped from DM325,405,000 to DM297,319,000, or from 5.3 to 4.6% of all exports, over the year, while U.K. exports of chemical products to the Federal Republic fell from DM182,969,000 to DM161,295,000, or from 6.6 to 6% of all West German chemical imports.

Commercial News

- Sales up, profits down for Beechams
- Celanese expect further rise in turnover
- Chemical sales account for 2/3 Grace profits
- Dominion Tar shares on Dutch Exchange

Ashe Laboratories

Ashe Laboratories Ltd., wholly owned subsidiary of Ashe Chemical, have acquired the capital of Stephen Matthews at a total price of £7,500.

Beecham Group

Sales of Beecham Group Ltd. totalled £58,631,000 in the year ended 31 March (£56,344,000). Group trading profit was £7,913,000 (£8,364,000). Taxation took £3,471,000 (£3,807,000) and the net profit attributable to the parent company was £4,026,000 (£4,127,000). A final dividend of 14%, making 30% (same), is proposed.

Borax

Group trading profit of Borax (Holdings) increased to £1,289,548 in the three months to 31 March (£1,130,235 in the corresponding quarter a year ago) making £2,311,057 for the six months to 31 March (£1,872,382).

The improved results are attributable to a high level of activity in the markets which consume the group's boron products, though this has been less marked in the U.K. than elsewhere, the directors state.

Profit margins of the group's other chemical products manufactured in the U.K. are under pressure, they add. Net profit for the quarter was £587,530 (£521,332) and for the half year £1,034,573 (£857,197).

Burrell and Co.

Although sales during the first few months of 1962 were somewhat lower due to keener competition, Mr. K. Burrell, chairman of Burrell and Co. Ltd., reports that the pooling of resources with those of Cornbrook Chemical and Cromford Colour should put the group in a stronger position to meet competition. He sees no reason why 1962 should not be another successful year. Sales of the Australian associate's output increased only slightly due to unfavourable economic conditions and they are not yet producing profits.

British Celanese

Group trading profit of British Celanese Ltd., one of the Courtaulds group, totalled £6,176,783 (£4,980,612) in the year ended 31 March. Depreciation took £1,479,821 (£1,422,626) and tax £2,396,195 (£1,533,182). Net profit was £2,444,690 (£2,255,167). A final dividend of 15% will make 30% (25%).

The directors feel that turnover will again rise in the current year and that this will offset higher labour costs and other increased charges. They also expect higher profits.

W. R. Grace

Chemical sales accounted for over two-thirds of the 1961 net profit of the New York concern W. R. Grace and Co. Profit totalled $18,830,000, or 16% up on 1960, despite a fall in total turnover from $552,900,000 to $534,700,000. Of the 1961 total turnover some $252,400,000 came from chemical sales. Last year, W. R. Grace invested $55,900,000 ($51,500,000), including $29,200,000 ($24,100,000) on chemical projects. In the future the chemical side of the company's activities is to be expanded further.

Major and Co.

Major and Co. Ltd. have announced a one-for-one scrip issue and expect to pay a final dividend of 25% on the double capital.

Cyanamid Italia

Cyanamid Italia, of Rome, the Italian subsidiary of American Cyanamid are to pay a dividend of 620 (1,060) lire per share of 10,000 lire nominal value for the financial years ended 30 November last.

Dominion Tar

Shares of the Canadian chemical company, Dominion Tar and Chemical Co. Ltd., have been introduced to the Amsterdam Stock Exchange.

Du Pont

Pending further study of the problems involved, E. I. du Pont de Nemours have postponed action on their plans for divesting the 63 million shares held in General Motors. Divestiture must start by the end of July and be completed by the end of February 1965.

Heyden

Chemische Fabrik von Heyden AG are recommending for the past financial year a dividend payment of 12% plus 2% on DM5,040,000 worth of founders' shares (1960: 10% plus 2%), as well as a dividend of 5% on DM36,000 worth of priority shares. Among major shareholders of the company are Olin Mathieson Chemical Corporation, Rütgerswerke AG, of Frankfort-on-Main, West Germany, and the German bank Dresdner Bank AG.

Kali-Chemie

Turnover of Kali-Chemie AG for 1961 totalled DM212.7 million (DM206.3 million). Net profit was DM6.6 million (DM6.7 million) after depreciation of DM18.3 million (DM16.5 million) and tax of DM15.5 million (DM17.4 million). As stated in 'Commercial news', 5 May, dividend is kept at 12%.

Kleber-Colombes

Pneumatiques et Caoutchouc Manufacturé Kléber-Colombes, Paris, are to pay for 1961 an unchanged dividend of 8%. Profit rose over the year from NF.5,250,000 to NF.6,230,000, while turnover increased by some 7¼% to NF.483,200,000.

Labatt Duphar

Labatt Duphar, Ltd., London, Ontario, have acquired an interest in Stevenson, Turner and Boyce Ltd., Guelph, Ont., Canada's leading manufacturers and distributors of pharmaceuticals. Labatt Duphar are associates of John Labatt Ltd., brewers, London, Ont., Phillips Electronics Industries Ltd., and Philips-Duphar, Amsterdam.

Procter and Gamble

Group net earnings of Procter and Gamble for the nine months ended 31 March rose to $88,092,203 from $84,917,948 for the same period in the preceding year. Net earnings per share were $2.10 ($2.04).

Saline Ludwigshalle AG

Saline Ludwigshalle AG, Bad Wimpfen-on-Neckar, West Germany, associates of Kali-Chemie AG, Hanover, announce for 1961 a dividend of 9% (same). Ludwigshalle have recently doubled their capital from DM.2 million to DM.4 million. It is not known whether the current rate of dividend will be maintained for 1962 due to the investment of DM.5 million that will be spent on a new fluorocarbon project (see 'Overseas News').

Zout-Ketjen

Consolidated net profit for 1961 of Koninklijke Zout-Ketjen N.V. was Fl.23.1 million (or £2.28 million). The combined results of the former Ketjen and Royal Dutch Salt companies did not differ materially from the results achieved individually in 1960. The directors are confident that 1962 will also yield good results. As stated in CHEMICAL AGE, 12 May, p. 782, the dividend is 15% cash plus 5% in stock.

NEW COMPANIES

H. BELLRINGER LTD. Cap.: £2,000. Chemical manufacturers, etc. Directors: John Noble and Mrs. Muriel Noble. Reg. office: 1 Elton Street, Salford.

THERA CHEMICAL LTD. Cap. £1,300. Manufacturers of chemicals, dyes, cosmetics, soaps, soap substitutes, detergents, etc. Subscribers: J. R. Little (director of L. P. Holding Co. Ltd., etc.), J. M. O'Connor. Reg. office: Iando House, 43 Bartholomew Close, London E.C.1.

Gas chromatography applied to kinetic studies

FUTURE developments in the field of gas chromatography will probably include the replacement of chart recorders by electronic measurement circuits, the analysis of samples with vapour pressures as low as 10^{-5} mm., and the advancement of the speed of analysis to something of the order of 2.5 microsecs. in the case of easily separated mixtures. These predictions were made by Dr. J. H. Purnell, Technical Research Station, Spillers, Cambridge, in a lecture given at a recent meeting of the London Section of the Royal Institute of Chemistry.

Gas chromatography is being used at the Technical Research Station to aid kinetic studies. The kinetic unit has a built in gas chromatography unit which was described by Dr. Purnell, together with some of the work being carried out, during the course of his lecture.

The three main requirements of the gas chromatography apparatus were: a sampling valve capable of working with high vacuum on one side and pressure on the other; high speed of analysis, comparable with the speed of the reaction being studied; and high sensitivity. To satisfy these requirements it was necessary to design and build the apparatus at Cambridge since no commercially available apparatus was suitable. The problem of sensitivity was solved early on when the hydrogen flame ionisation detector was described by U.S. workers.

The sampling valves available commercially are generally based on some kind of rotary or sliding valve; many valves of this type were constructed and tried but nothing suitable was found. A greaseless tap was constructed using O-ring seals, this being found to be both simple and satisfactory.

To achieve high speeds of analysis many variables had to be investigated. In 1956 the analysis of a hydrocarbon mixture was successfully carried out in 4 minutes, the 'normal' period of analysis at that time being of the order of 30 mins. In this case there was little solvent in the column. It was shown that the ratio of solvent to gas space in the column was critical if high speeds of analysis were to be obtained. The concept of the number of theoretical plates in a column is of importance only when the liquid volume is large.

Analyses possible at present include the separation of a mixture of *iso-* and *n*-butane with *iso-* and *n*-pentane in four seconds, and the separation of 4, 5 and 6-carbon aliphatic hydrocarbon mixtures in two seconds.

In Parliament

Extra accommodation sought for N.C.L.

THE provision of additional accommodation for the National Chemical Laboratory is under consideration, Mr. Denzil Freeth, Parliamentary Secretary to the Ministry of Science, said this week in a written reply. No decision has been made regarding the possibility of moving it to a new site.

Market Reports

STEADY MOVEMENT AGAINST CONTRACTS

LONDON There has been little of outstanding importance to record in the market for industrial chemicals but a steady movement of supplies against contracts has been reported. New business on home account has been mostly for current requirements while export inquiry has been maintained at about recent levels. There has been a moderate demand for agricultural chemicals while the position of the coal tar products market is unchanged with prices well held.

MANCHESTER Both home consumers and shippers of chemicals are reported to be specifying for fairly steady deliveries against current commitments. Replacement buying on account of both branches of trade is also reasonably satisfactory, with the bulk of the business relating to prompt or early delivery parcels. Wtih an odd exception quotations generally have been well maintained. In the tar products section, most materials, both light and heavy, are in quietly steady demand. The cuts in fertiliser prices to operate during the coming season should help to sustain, if not further stimulate, consumption.

SCOTLAND Once again the past week has been quite a busy one and a fairly active position has prevailed in most sections of the industry. Quantities have again been very well maintained both in regard to spot and contract chemicals, with emphasis very much on the delivery position. A good volume of business can also be reported in regard to agricultural chemicals both for immediate and forward requirements. There is little change in the overseas market which has followed more or less the usual pattern.

New approach to on-line process automation

BRITAIN in the past has tended to lag behind other countries, such as the U.S., Russia, Czechoslovakia and France, in the application of technical advances in computing and automation; she has an opportunity now to lead in the use of an entirely new approach to one-line process automation suitable for all processing industries including chemicals.

Known as Arch, standing for an articulated computing hierarchy, permitting the construction of industrial control systems from a range of basic modules to meet particular requirements of any problems, it was demonstrated in London recently by Elliott-Automation Ltd., 34 Portland Place, London W.1. The modules, both analogue and digital types, may be freely interchanged and added to, it was explained, so as to facilitate the modification and extension of a control system without the need for costly replacements. By this means systems of any type may be assembled, from the smallest to those comparable with full scale general purpose computers.

Arch provides a bridge between two concepts, the computer of limited flexibility and the expensive (largely because of its redundancy) general purpose type, and has the support of the National Research Development Corporation. Elliott-Automation are shortly starting special courses of one week's duration for 20 or 30 persons to which firms can send representatives for training in the application of Arch.

Geigy increase plasticiser prices

THE Geigy Co. have increased the price of their phthalate plasticiser Reomol DNP by £4 per ton (just over 2¼%). The change took effect from 9 May and was necessitated, the company states, by an increase in the price of nonanol.

Geigy made a general cut of 2-3% in the price of their range of phthalate plasticisers last month, which was attributed to the lower cost of phthalic anhydride. The plasticisers are mainly used in polyvinyl chloride compounds.

DIARY DATES

MONDAY 28 MAY

Coal Prep. Plant Exhib.—Harrogate: Exhibition Hall.

International Instr., Elect., & Automation Exhib.—London: Olympia, 10 a.m.

WEDNESDAY 30 MAY

B.N.E.S.—London: Inst. Civil Eng., Gt. George St., S.W.1, 5.30 p.m. 'Nuclear power—a year of promise' by Sir Roger Makins.

Forest Products Research Lab.—Princes Risborough: Open Day.

THURSDAY 31 MAY

Northern Poly.—London: Chem. Dept., Lec. Thea., Holloway Rd., N.7, 7.15 p.m. 'Recent advances in semiconductor strain gauges, temperature and pressure transducers' by A. Moen.

S.C.I.—London: Shell Mex House, Strand, W.C.2. A.g.m. & Film Show.

Bookshelf

Complete text on simple organic molecular orbital theory

MOLECULAR ORBITAL THEORY FOR ORGANIC CHEMISTS. By *A. Streitwieser, Jr.* John Wiley and Sons, London, 1962. Pp. xvi + 489. 109s.

Few books have been published on this topic and this volume represents an important and valuable addition. It deals in considerable detail with the simpler molecular orbital techniques as they have been applied to a number of organic topics. Brief accounts are also included of the complementary valence-bond and free-electron theories.

About one-third of the book is taken up with a description of the Hückel theory and its modification to deal with heteroatoms. This part of the book also contains a useful section on the use of group theory—a powerful aid in solving the secular equations associated with large molecules. The more advanced methods such as the antisymmetrised molecular orbital method are, however, dismissed in some 18 pages; this section is not comprehensive enough to be of value to workers tempted to use more powerful techniques.

Taking the author's title as yard-stick, this book succeeds handsomely in its aim. It is a complete text containing the elements of quantum mechanics as well as instruction in simple molecular orbital theory.

Non-aqueous solvents

CHEMISTRY IN NON-AQUEOUS SOLVENTS. By *H. H. Sisler.* Chapman and Hall, 1962. Pp. viii + 119. 16s.

This book is one of the first to be issued in a series entitled 'Selected topics in modern chemistry' edited by the author and C. A. Van der Werf. The series is intended to enrich undergraduate chemistry courses. The present volume fulfils this aim admirably. In this country it could be read with profit either by scholarship candidates in sixth forms or by first year students at universities. Many chemists who have left their student days far behind could also read the book with enjoyment and profit.

The treatment is essentially that of the inorganic chemist which is particularly suitable for this level. More quantitative treatments would require greater knowledge on the part of readers. Similarly, little is said about the use of the less usual solvents in preparative organic chemistry.

The first chapter on the role of the solvent clearly points out the uniqueness of water. Ammonia and sulphuric acid are considered fairly fully in the next two chapters. The fourth on liquid oxide systems is largely devoted to dinitrogen tetroxide and sulphur dioxide. Finally the range of non-aqueous solvents is briefly surveyed.

Gas chromatography

PROGRESS IN INDUSTRIAL GAS CHROMATOGRAPHY, VOL. 1. Edited by *H. A. Szymanski,* Plenum Press, New York, 1961. Pp. 235. $10.

The subtitle 'Proceedings of the Third Annual Gas Chromatography Institute held at Canisius College in Buffalo, April 1961' is a more accurate description than the main title which one can only suppose was selected to attract unwary purchasers. Apart from the fact that the authors of many of the sections work in industry there is nothing specifically 'industrial' about the contents. The editor presents a dozen unco-ordinated contributions which range from general reviews that contain little specific information, through discussions of the author's own experience presented as though it gave a balanced view of the field, to specific attempts to solve problems. No doubt many who attended the institute picked up some useful tips and may have been stimulated to improve their own operations. The book as a whole cannot be recommended to any private buyer. Only the wealthier libraries need consider a purchase. Better balanced books by single authors now appear regularly. They are often cheaper and all known to the writer are better bargains.

The absence of an index makes it difficult to refer to the many useful facts scattered about this book.

Organic chemistry

ADVANCED ORGANIC CHEMISTRY. By *L. F. Fieser* and *M. Fieser.* Chapman and Hall, London, 1962. Pp. 1158 + ix. 112s.

This book replaces the well-known and much appreciated Fieser text of six years ago. Professor Fieser in his preface explains the choice of title with characteristic elan, but in fact the book is better described as being up to date rather than advanced. It is a basic text intended for the beginner as well as for senior undergraduates, but all students of organic chemistry, including those now teaching the subject, will find this latest Fieser book of great value. The book has plainly developed from its forerunner, but the scope has been much curtailed; the chapters on heterocycles, alkaloids, steroids, polymers and vitamins have all been omitted, together with the three chapters on metabolism. The result is clear profit, for there is now more concentration on the fundamental chemistry of functional groups and the electronic and steric factors affecting reactivity are discussed, very fully for a text of this type. The general plan of the book leads to conformational effects, for example, being discussed not en bloc as a separate topic, but in relation to the various reactions and groups as these are dealt with in turn. One consequence of this arrangement may disconcert some readers, for steroid formulae make their appearance early in the book. Steroids and other naturally occurring molecules are in fact used liberally to illustrate basic reactions. While the publisher's claims may be rather enthusiastic this volume undoubtedly does contain an amazingly large store of information on important recent research and speculation. It is only necessary to add that this book is written with all the clarity and gift for lucid explanation that one expects from these authors.

This is certainly one of the two or three best organic texts available today, and is the most readable and stimulating of all.

Inorganic chemistry

INTRODUCTION TO ADVANCED INORGANIC CHEMISTRY. By *P. J. Durrant* and *B. Durrant.* Longmans, London, 1962. Pp. xvi + 1171. 95s.

The first 360 pages of this book are largely devoted to material that is discussed in similar detail in most of the larger texts of physical chemistry. The arrangement of courses in this country is such that few students will learn about molecular spectra, say, along with their inorganic chemistry. The remaining 800 pages contain an enormous number of facts, many of which are presented in tabular form. These sections must tax the most retentive memory. They are of little use for reference as there are very few indications of where the original work can be found. This is a serious defect in any book that purports to be an introduction to an advanced study of the subject.

Dr. P. J. Durrant is well known as the writer of successful elementary texts so that his contribution to the problem of how to teach inorganic chemistry should be carefully considered. Unfortunately he gives no guide to the student. Any beginner who tried to read straight through would suffer from severe intellectual indigestion. He would be best advised to use the book as a quarry out of which to hew his own materials to construct a work in which the interrelations between the compounds of the elements is clearly displayed.

U.K. TEL consumption drops in first quarter

Consumption of tetra ethyl lead by main trades in the U.K. in the three months ended 31 March was 5,571 tons, compared with 6,894 tons in the corresponding period last year, according to the British Bureau of Non-ferrous Metal Statistics.

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 5s including postage; annual subscription £12 10s.

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 27 June

Method for extracting and separating alcohols in organic media. Labofina SA. **899 602**

Phosphorus-containing organic compounds. Imperial Chemical Industries Ltd. **899 701**

Manufacture of polymeric materials. Imperial Chemical Industries Ltd. **899 942**

Hydrogenation of hydrocarbon-containing oils. Gas Council. **899 574**

Refining of gasoline. British Petroleum Co. Ltd. and White, P. T. **899 651**

Catalysts and hydrogenation processes using the catalysts. British Petroleum Co. Ltd. and White, P. T. **899 652**

Hydrogenation of gasolines. British Petroleum Co. Ltd. and White, P. T. **899 653**

Hydroxycycloaliphatic acids and their salts. Soc. d'Exploitation des Laboratories J. Logeais S.ar.L. **899 737**

Methods of producing aromatic compounds substituted by hydrocarbon groups in the nucleus. Philips' Gloeilampenfabrieken NV. **899 604**

Preparation of acrylic-type polymers which are insolubilised in situ after polymerisation and end product application. Rohm & Haas Co. **899 943**

4-Piperidyl esters. Westminster Bank Ltd. [Addition to 824 425.] **899 605**

Method of desulphurising gases and recovering elementary sulphur from sulphur-containing constituents thereof. Soc. d'Etude et de Developpement de la Catalyse Industrielle Socaty. **899 708**

Synthetic resin compositions. Pure Chemicals Ltd. **899 577**

Dyestuffs of the phthaloylisoindolenine series. Farbenfabriken Bayer AG. **899 709**

Cyclopentanophenanthrene compounds and process for the production thereof. Syntex SA. **899 770**

Method of crystallising adipic acid. Stamicarbon NV. **899 771**

Linear high molecular weight polymers and copolymers of organometallic vinyl monomers. Montecatini. **899 945**

Polymer - containing compositions. Monsanto Chemical Co. **899 999**

Process for purifying acrylonitrile. Sicedison S.p.A. **899 641**

Detergent compositions. Rohm & Haas Co. **900 000**

Process for the preparation of a methoxy-indolyl propylamine. Laboratoires Francais de Chimiotherapie. [Addition to 887 915.] **899 548**

Indole compounds. Laboratoires Francais de Chimiotherapie. **899 549**

Linear siloxane copolymers. Midland Silicones Ltd. **899 657**

Resinous poly-α-olefines and their preparation. Eastman Kodak Co. **899 946**

Production of isonitriles. Ugi, I. K., and Meyr, R. **899 880**

Process for the manufacture of very pure crystalline silicon carbide. Wacker-Chemie GmbH. **899 947**

Process for the purification of silicon chloroform. Wacker-Chemie GmbH. **899 553**

Method of forming uniform uncontaminated iron oxide for pigment and other uses. Northern Pigment Co. Ltd. **899 882**

Organosiloxane compositions. Midland Silicones Ltd. **899 660**

Metal-complexes of monoazo dyestuffs containing unsaturated acylamino groups. Imperial Chemical Industries Ltd. **899 714**

Substituted isonicotinic acid amides and process for their manufacture. Farbwerke Hoechst AG. **899 556**

Monoazo dyestuffs containing halotriazine residues and their manufacture and use. Ciba Ltd. **899 886**

Cyclopentanophenanthrene derivatives and a process for the production thereof. Syntex SA. **899 582**

Process for producing partially chlorinated amine boranes. Imperial Chemical Industries Ltd. **899 557**

Chemical processes. Imperial Chemical Industries Ltd. **899 558**

Process for the preparation of a purified lipoid. Wander AG, A. **899 559**

Process for the production of acid anthraquinone dyestuffs. Farbenfabriken Bayer AG. **899 682**

Polymer irradiation. Nobel-Bozel. **899 683**

Production of acetic acid or mixtures of same with methyl acetate. Badische Anilin- & Soda-Fabrik AG. **899 889**

Rubber antidegradants. Monsanto Chemicals Ltd. **899 930**

Process for preparing copolymers of vinyl chloride and vinyl acetate. Farbwerke Hoechst AG. **899 593**

Benzothiazolyl furans. Ilford Ltd. **899 916**

Polymethine dyes. Ilford Ltd. **899 917**

Organo-tin compounds. Imperial Chemical Industries Ltd. **899 948**

Process for the production of catalysts for the combined refining and benzinisation of medium or medium-heavy oils. Leuna-Werke W. Ulbricht Veb. **899 684**

Hydrogenation of acetylenes. Imperial Chemical Industries Ltd. **899 949**

Substituted 3 : 4-dihydro-1 : 2 : 4-benzothiadiazine-1 : 1-diodes, and their preparation. Ciba Ltd. **899 595**

Sulphamyl-anilines and process for their manufacture. Ciba Ltd. **899 596**

16-Substituted-3-oxo-$A^{1,4}$-steroid compounds. British Drug Houses Ltd. **899 804**

Therapeutic preparations. Bristol-Myers Co. **899 583**

Organopolysiloxane lubricants. Farbenfabriken Bayer AG. **899 686**

Activators for the polymerisation of 2-pyrrolidone. Chemstrand Corporation. **899 665**

Polyamides and the manufacture thereof. Inventa AG für Forschung und Patentverwaltung. **899 687**

Coating compositions and in thermoplastic polymeric films coated therewith. Du Pont de Nemours & Co., E. I. **899 830**

Hydrazinium betaines, to their production, and to polymers obtained therefrom. Grace & Co., W. R. **899 826**

Crystalline griseofulvin. Glaxo Laboratories Ltd. **899 667**

Antibiotics. Glaxo Laboratories Ltd. **899 668**

Polyamide stabilisation. Union Carbide Corporation. **899 896**

Processes for the production of steroid derivatives, and the derivatives thus produced. Laboratoires Francais de Chimiotherapie. **899 995**

Organo-phosphorus derivatives. Farbenfabriken Bayer AG. **899 897**

Halogen - containing polyurethane foams and method of preparation. Hooker Chemical Corporation. **899 805**

Production of epoxy alcohols. Shell Internationale Research Maatschappij NV. **899 716**

Isomerisation process. Hoffmann-La Roche & Co., AG, F. **899 898**

Process for the production of arylalkyl polysiloxanes. Farbenfabriken Bayer AG. **899 937**

Age-resistant cross-linked ethylene polymers. Vanderbilt Co. Inc., R. T. **899 796**

Aqueous compositions of novolak resins. Soc. d'Etudes et d'Applications Industrielles, Commerciales et Immobilieres Inter-Technique. **899 776**

Pharmacological benzylamine compounds and the manufacture thereof. Upjohn Co. **899 777**

Polyethylene-coated paper and process for its manufacture. Zellstoffabrik Waldhof. **899 981**

Oil additives. Rohm & Haas GmbH. **899 780**

Purification of polyethers. Allied Chemical Corporation. **899 982**

Low-pressure polymerisation product recovery process. Esso Research & Engineering Co. **899 843**

Pectin composition. General Foods Corporation. **899 588**

Process for the production of acetic acid from methanol and carbon monoxide. Badische Anilin- & Soda-Fabrik AG. **899 691**

Method for refining benzene. Mine Safety Appliances Co. **899 983**

Anthraquinone dyes. Badische Anilin- & Soda-Fabrik AG. **899 984**

Production of solid sodium and/or potassium sulphites. Badische Anilin- & Soda-Fabrik AG. **899 566**

Hydroxy amino acid derivatives. Frosst & Co., Charles E. **899 781**

Diorganopolysiloxane polymerisation. Dow Corning Corporation. **899 938**

Method of producing cyclotrimethylene trinitramine. Wasag-Chemie AG. **899 692**

Acyl-oxy-end-blocked diorganopolysiloxanes. Dow Corning Corporation. **899 939**

Purification of hexafluoropropylene. Du Pont de Nemours & Co., E. I. **899 693**

Chemical compositions. Rohm & Haas GmbH. **899 784**

Oxidation and reclamation process. Sterling Drug Inc. **899 988**

Ethylene-propylene copolymers. Sun Oil Co. **899 786**

Glycidyl ester copolymers. Devoe & Raynolds Co. Inc. **899 940**

Process for the hydrorefining of hydrocarbon mixtures. Badische Anilin- & Soda-Fabrik AG, Harpener Bergbau AG, and Scholven-Chemie AG. **899 695**

Process for preparing alkyl and aryl lead compounds. C. I. P. Compagnia Italiana Petrolio S.p.A. **899 697**

Process for the production of vitamin-A-aldehyde. Farbenfabriken Bayer AG. **899 991**

Process for regenerating iron oxide-containing oxidising agents. Shell Internationale Research Maatschappij NV. **899 698**

Anti-protozoal compositions comprising hydroxyquinoline and nitrothiazole derivatives. Wallace & Tiernan Inc. **899 992**

Preparation of block or graft copolymers. Solvay et Cie. **899 993**

Graft copolymers for olefinically unsaturated monomers and polycondensates and a process for their production. Badische Anilin- & Soda-Fabrik AG. **899 567**

Process for the manufacture of benzaldehyde or substituted benzaldehyde from the corresponding benzal chloride. General Aniline & Film Corporation. **899 953**

Purification of acetylene. Soc. Belge de l'Azote et des Produits Chimiques du Marly. **899 699**

Process for producing 1 : 3 : 4-thiadiazoles having aromatic substituents. Ciba Ltd. **899 842**

Akylation of aromatics employing specially prepared olefin feed. Esso Research & Engineering Co. **899 954**

Process and apparatus for refining benzene. Soc. Pour l'Exploitation des Procedes Ab-Der-Halden. [Addition to 837 295.] **899 799**

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PATENTS & TRADE MARKS

KINGS PATENT AGENCY, LTD. (B. T. King, A.I.Mech.E., Patent Agent), 146a Queen Victoria Street, London, E.C.4. City 6161. Booklet on request.

The Proprietors of Patent No. 724229 for "Improvements in or relating to Nitric Acid Concentration" desire to secure commercial exploitation by Licence in the United Kingdom. Replies to Box No. 3794, Chemical Age.

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LABORATORY TECHNICIAN, Horley County Secondary School (Bilateral) required September. Salary Scale N.J.C. Miscellaneous Division Grade III. "O" and "A" levels in all sciences; nine laboratories. Applications in writing to the Headmaster, Balcombe Road, Horley, Surrey.

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Applications close in New Zealand and London on **31 July, 1962.**

Classified Advertisements can be accepted up to 10 a.m. Tuesday for insertion the same week.

BOX NUMBERS: *Reply c/o "Chemical Age" · Bouverie House · Fleet Street EC4,*

TRADE NOTES

Gas Chromatography oven

Latest addition to the range of oven units of Gas Chromatography Ltd., Boyn Valley Road, Maidenhead, Berks, is the S.4 oven. Its special features are two recorders, two amplifiers, two detectors, two columns and a linear integrator.

Models S.4.A and S.4.B offer variations allowing, for example, the simultaneous use of dissimilar detectors.

As well as capillary columns and conventional packed columns, preparative columns can also be supplied for use with the company's ovens. The units have been designed to take virtually any commercial detector.

Pinene linalols

There are now two new linalols in the A. Boake, Roberts and Co. range of standard aromatics from pinene, both of 99-100% purity. The latest, standard A, described in a new brochure available from the company at Carpenters Road, London E.15, retains certain trace impurities in order to provide the slight 'woody' note demanded by some perfumers.

Ceramic labels

Ceramic labels for laboratory reagent bottles are now available in a wide range of standard titles from Baird and Tatlock (London) Ltd., 14-17 St. Cross Street, London E.C.1. Produced by a special process at B.T.L.'s Walthamstow factory, they are in black lettering on a white background, and are permanent and resistant to chemical action and mechanical abrasion.

Edgar Allen area office

Edgar Allen and Co. Ltd., engineers, have set up an area office at Room 24, Exchange Buildings, Newcastle upon Tyne (Newcastle 21891).

Concrete sealer

Details of their Genlak sealer, a plastics solution that renders concrete floors proof against mechanical wear and chemical attack, except from sulphuric and organic acids, providing non-slip surface, are given in information sheet No. 2 now available from Genpur Products Ltd., Hammond Road, Kirkby Trading Estate, Liverpool, Lancs.

Changes of name

Gresham Chemicals Ltd., manufacturers of and dealers in chemicals, etc., 274 Gresham House, Old Broad Street, London E.C.2, have changed their name to S. R. Van Duzer and Son Ltd.

Floorlife and Chemicals Ltd., 37 Norfolk Street, London W.C.2, have changed their name to Floorlife and Building Chemicals Ltd.

Draiswerke concessionaires

The London company K. W. Chemicals Ltd., Caroline House, 55-57 High Holborn, W.C.1, have recently been appointed the first U.K. concessionaires for Draiswerke, makers of chemical and plastics processing machinery, of Mannheim. A leaflet on their range including a new hydraulic roller mill is available.

Pipework fabrication

From William Press and Son Ltd., Willoughby Lane, Tottenham, London N.17, civil and mechanical engineering contractors, comes a well-produced colour illustrated brochure describing the many products and technical services of their pipework fabrication division.

New grades of Methocel

Dow Chemical Co. (U.K.) Ltd. announce the addition of five new grades of Methocel (Dow methyl- and hydroxypropyl methyl- cellulose) to those grades of Methocel thickeners and protective colloids already available in the U.K.

The new grades which are suffixed DG. are in granular form and unlike standard Methocel can be directly dispersed in cold water. DG grades have less tendency to dust and foam in solution make-up than the standard grades. Details may be obtained from Dow's U.K. distributors, R. W. Greeff & Co., Garrard House, Gresham Street, London E.C.2.

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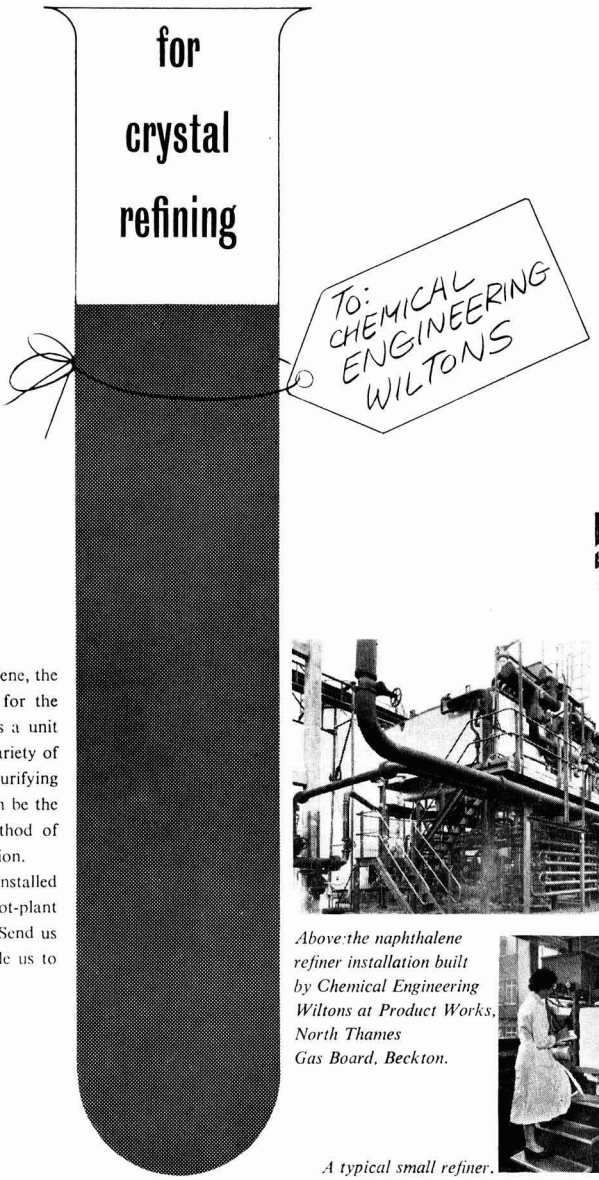

CHEMICAL & PETROLEUM ENGINEERING EXHIBITION OLYMPIA LONDON JUNE 20th-30th 1962

First evolved for the purification of naphthalene, the Wilton-Proabd Refiner has been developed for the upgrading of benzene and can be applied as a unit operation for the crystal refining of a wide variety of compounds. This important addition to the purifying processes available to chemical engineers can be the simplest, most efficient and economical method of improving purity or effecting material separation.

Chemical Engineering Wiltons have already installed five Refiner plants and at Cheadle Heath a pilot-plant correlated to full-scale working is available. Send us a 100 cc sample and product details to enable us to advise you on your purification problems.

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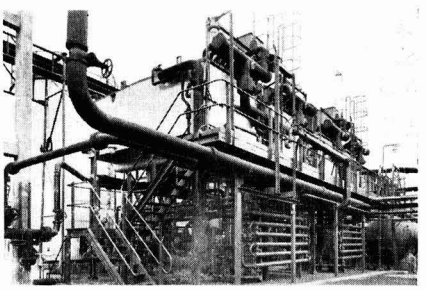

Above: the naphthalene refiner installation built by Chemical Engineering Wiltons at Product Works, North Thames Gas Board, Beckton.

A typical small refiner.

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