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VOL. 86 No. 2190

1 JULY 1961



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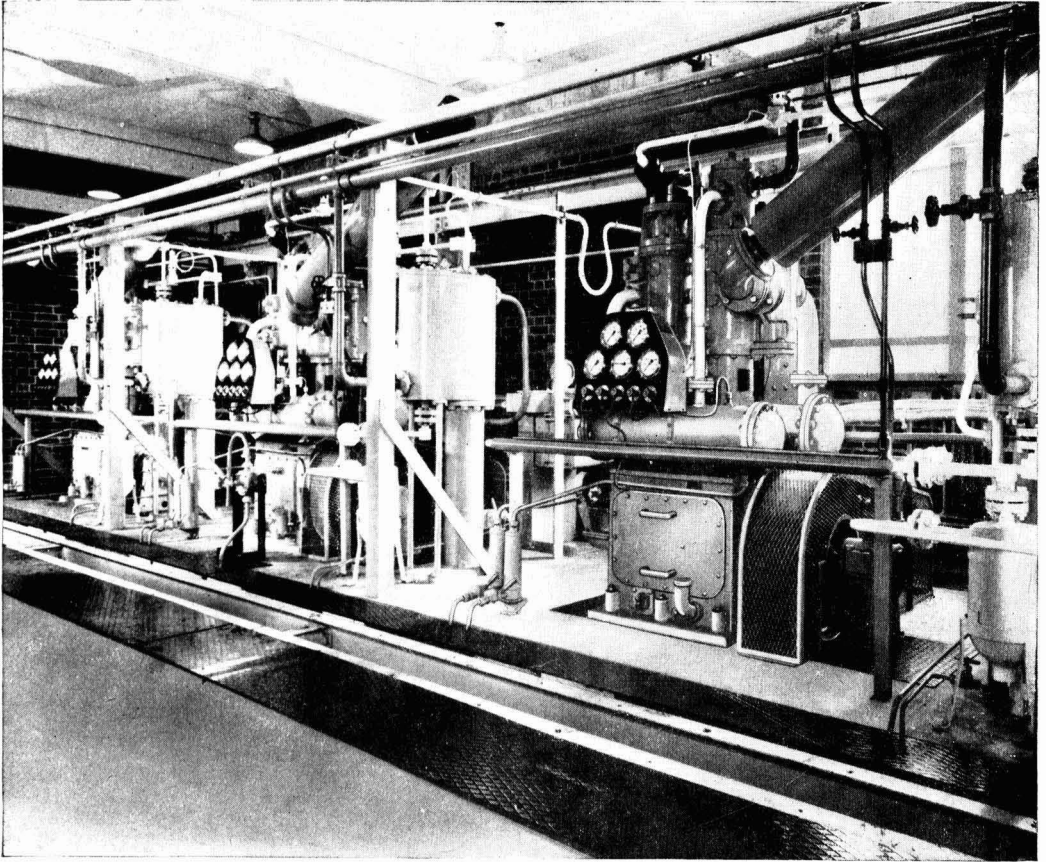
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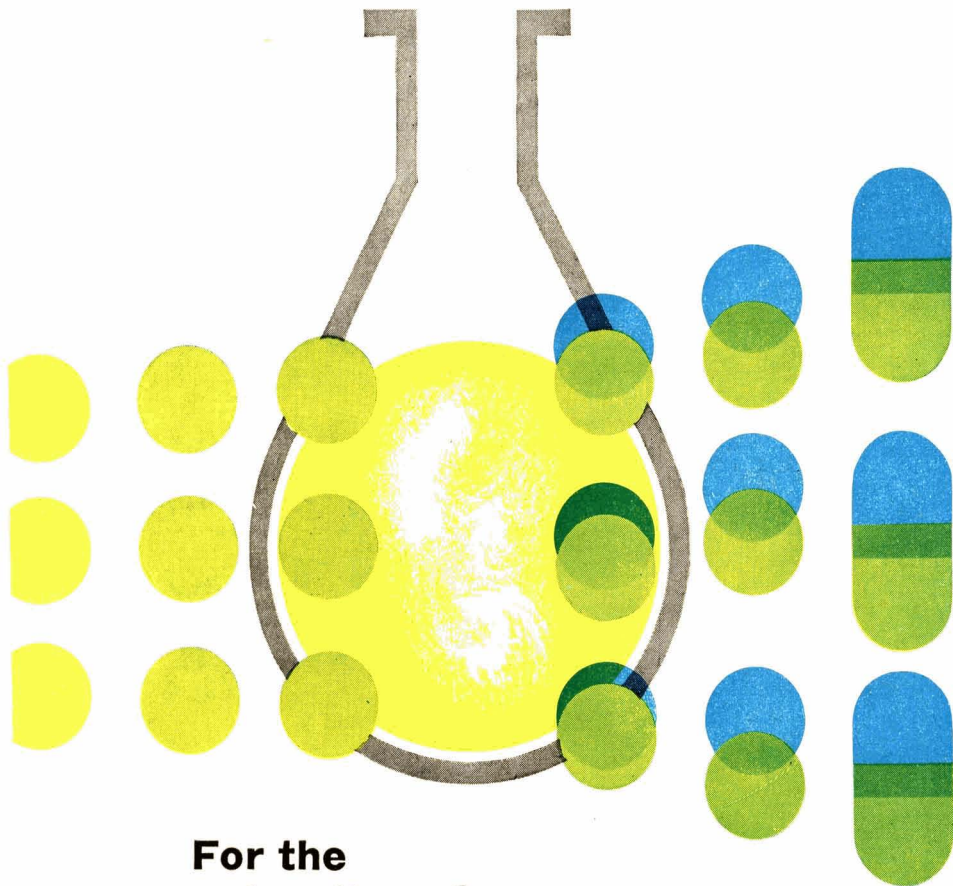
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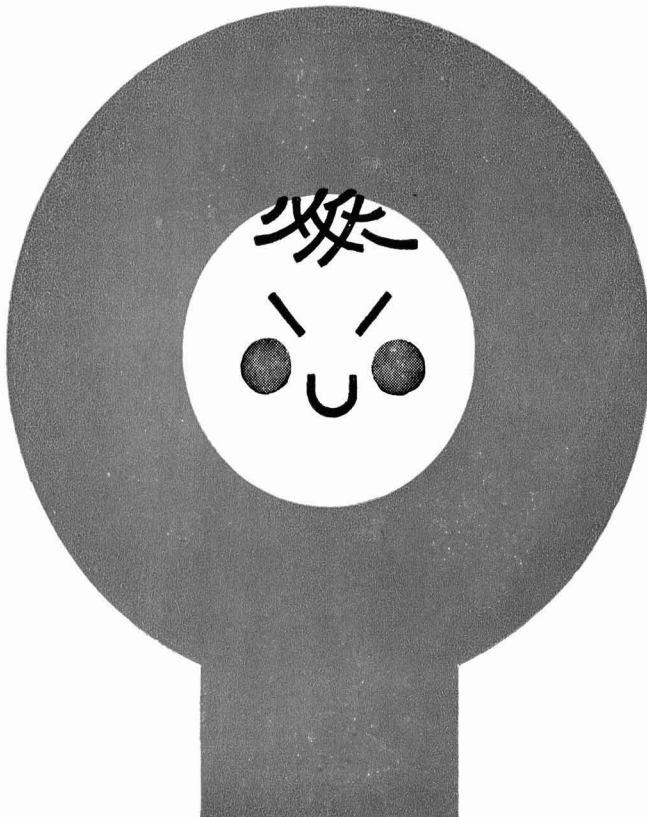
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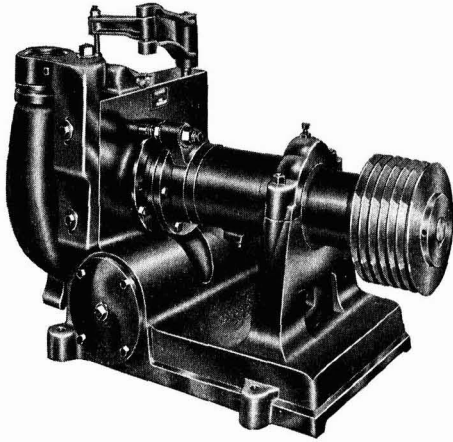


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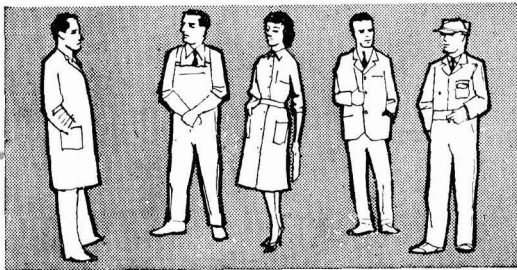
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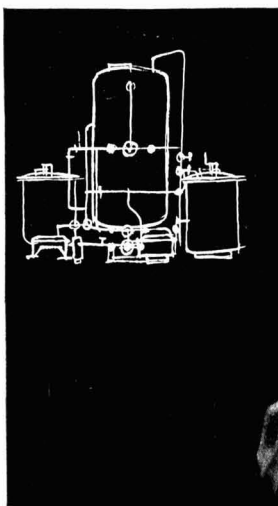
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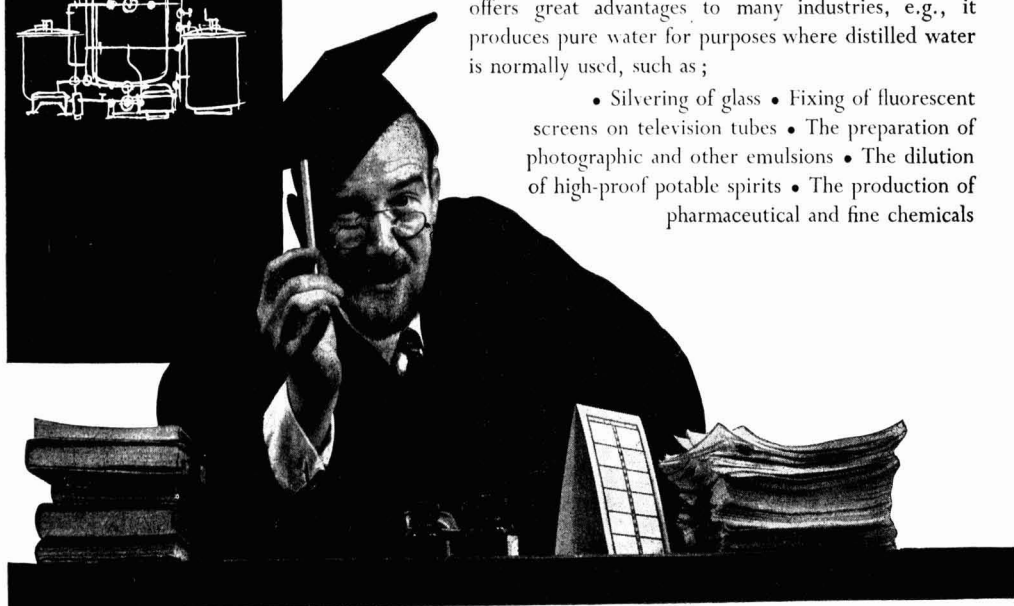
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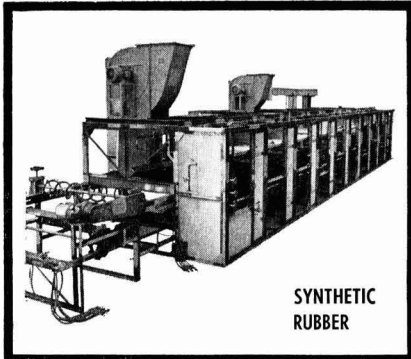
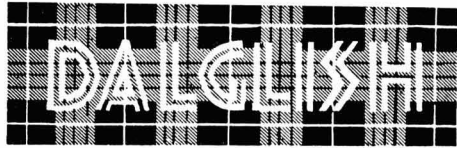
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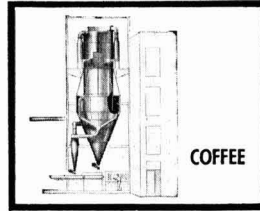
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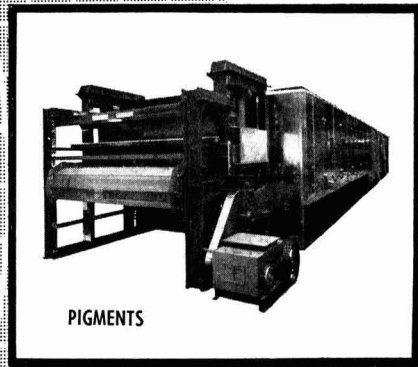
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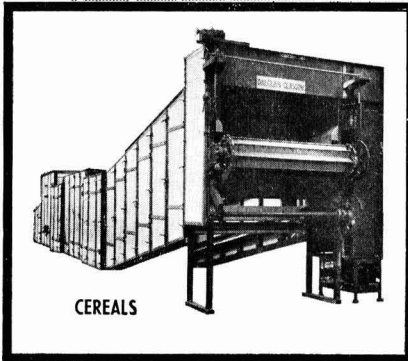
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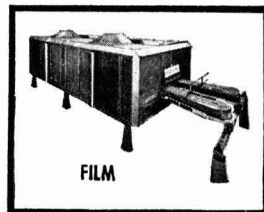


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# Chemical Age

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**PETROCHEMICALS and POLYMERS****BOUVERIE HOUSE · 154 FLEET STREET · LONDON · EC4****TRADE WITH U.S.S.R.**

**T**HE gulf between U.S. and British views on trading in chemical plant and process know-how with the Soviet Union is wide and well known. The U.S. policy of barring trade in these fields, fully backed by the chemical industry of that country, also has the support, it appears, of the head of one of Europe's largest chemical concerns—Mr. E. J. Solvay.

In a recent speech in New York, reported in *CHEMICAL AGE*, 17 June, p. 989, he called for at least 'a minimum of understanding and collaboration' between the Western chemical industries if the Soviet industry was not to reap 'ridiculous benefits from the operations of its import-export services with its natural tendency to depart from the normal strictly economic form of competition wherever it suited its purpose.' In the face of the monolithic organisations that buy and sell for the Soviet Union, Mr. Solvay saw a free world represented by a motley collection of governments and private firms with no common interest at any given moment, without cohesion and with no prepared programme of action.

It is only prudent that the chemical industries of the West should get together on questions relating to trade with the Eastern bloc, particularly should any occasion of dumping or unfair marketing practices arise. That is one reason why this journal has strongly advocated a linking of the Six and the Seven; only thus can Europe meet the competition from the other two major blocs—North America and the Communist states.

But it would be wrong to try to impose on Europe the trading policies of the U.S., which are an attempt to take the 'cold-war' of politics into trade and commerce. Only by a free interchange of ideas, technologies and products can the ideological barriers be breached. There are immense opportunities for trade between the U.S.S.R. and Europe and it is to be hoped that the British chemical and chemical engineering industries will play their full part in this developing market. If, at some future date, it is found that chemicals are being dumped in Europe by the Soviet Union, then will be the time for joint action—preferably by a united European trading community.

In the meantime, Mr. Vladimir Bibishev, assistant head of the Economic and Chemical Department, of the U.S.S.R. Scientific and Economic Council, writing in *The Financial Times* supplement on the Soviet Union on Monday, pointed out that the current Seven-Year Plan will involve the erection of more than 140 new chemical plants and the expansion and reconstruction of many existing enterprises. Mr. Bibishev says that the import of foreign-made plant will help the U.S.S.R. fulfil its chemicals programme as soon as possible and he thinks that contacts with the West can be considerably broadened for the benefit of all concerned.

By 1965, Soviet output of polymers will exceed 1.8 million tons, a 62% rise in seven years and a growth rate which took the U.S. 15 or 16 years to achieve. By 1965, total consumption of plastics in the engineering industry will reach 500,000 tons, while the output of mineral fertilisers will rise to some 35 million tons, 3.1 million tons above the 1959 U.S. level. This year, gross output of chemical goods will increase by 14.5% above last year, with allocations for the construction of chemical enterprises

(Continued on page 14)

# Details of Mead Johnson Tie-up Proposals Bring Further Protests from British Drug Shareholders

OPPOSITION amongst shareholders of British Drug Houses Ltd. to the proposed deal with Mead Johnson and Co., the U.S. pharmaceutical manufacturers, announced at the end of last week, is steadily growing.

As reported in CHEMICAL AGE, 24 June, p. 1032, shareholders have been canvassed for support in arriving at an alternative proposal, and for the calling of an extraordinary meeting; since then canvassing has been continued by John Horn and Co., chartered accountants acting for a group of shareholders. The B.D.H. directors themselves are calling an extraordinary general meeting on 17 July for the purpose of getting the shareholders' approval of the Mead Johnson arrangement. Amongst the objections being raised are that this date is too early for proper consideration of amendments, that the B.D.H. shareholders will have lost the chance of profiting by a favourable take-over if the deal goes through, and that they have not been adequately informed as to how the £5 million extra to be obtained from Mead Johnson will be used.

## Terms Revealed

At a press conference last Friday, Mr. Geoffrey Eley, the B.D.H. chairman, revealed details of the proposed arrangement, which will involve:

(a) Access by B.D.H. to some £5 m. of fresh money on advantageous terms to be drawn as needed over the next five years. B.D.H. are formulating plans for development "which, together with our present requirements, will undoubtedly absorb such a sum."

(b) An agreement between the two companies for the manufacture and sale of one another's present and future pharmaceutical products on advantageous terms, and for a co-ordination of their research activities.

(c) The acquisition by Mead Johnson of approximately a 35% voting interest in B.D.H. which should ultimately be translated into a similar percentage holding of B.D.H. ordinary shares.

(d) Mead Johnson, from the outset, to be suitably represented on the B.D.H. board.

Mr. Eley revealed, further, that the bulk of the fresh money (over £4.5 m.) would come from unsecured convertible notes carrying an interest rate of 5% (see also 'Commercial News'). He continued: "While the financial terms are obviously attractive we regard the arrangements in the field of trade and research as unusually important. . . . They provide us with access to research resources on a scale far greater than anything we could have hoped to attain on our own for many years and make us partners in a joint effort that should be

extremely rewarding. Furthermore, from the point of view of our staff and our shareholders the arrangements, while providing all the advantages I have mentioned, ensure the continuance of B.D.H. as an independent entity which, in itself, is one of the objectives that Mead Johnson are anxious to help us secure."

Questioned about the new oral contraceptive that B.D.H. have under development, Mr. Eley said the only news he could give was that clinical trials had been proceeding in Pakistan, Japan and Australia following visits to those countries by Dr. Hartley, B.D.H. research director. He thought that, if all went well, B.D.H. might be in a position to issue the product in 1962.

Further details of the proposed arrangement are given in a circular letter to shareholders on 23 June, which reveals that £1.5 m. of the £5 m. would be used to discharge debts to bankers, the remainder being used for develop-

ment and working capital. Mead Johnson executives to be invited on the B.D.H. board are D. Mead Johnson, president; Harold O. McCutchan, executive vice-president; Lambert D. Johnson, Jr., executive vice-president; and Dr. Ben K. Harned, vice-president. This would bring the total number on the B.D.H. board to 16. With a view to co-ordinating research activities a research committee will be set up consisting of two representatives of each company.

The B.D.H. directors express confidence that this closer association with Mead Johnson, with whom the company has had "close and friendly relationships at various levels" over the past four years, will enable the business to be planned on a scale that would not otherwise be practicable, at the same time maintaining its independent status.

Mead Johnson, whose gross sales in 1960 were \$122.4 m., have pioneered in the development of nutritional and vitamin products, specialising particularly in infant nutrition. They were the first company to market Vitamin D in 1920. Current sales figures of B.D.H. are not available, but they totalled some £10 m. a year ago and are now thought to be somewhat higher. On a sales basis, therefore, Mead Johnson are about four times the size of B.D.H.

## Courtauld's 4% Koppers Acquisition Opens Up New U.S. Fields

ACQUISITION of 4% of the common stock of Koppers Co. Inc., the U.S. chemical and plastics company, at a cost of £1.5 m., takes Courtaulds Ltd. on their first step towards an important link with Koppers, as part of the U.K. company's diversification plans. In the U.S., these plans envisage extension of the company's activities outside the textile field into plastics and other products.

Courtaulds' only manufacturing facilities in the U.S. at present are for the production of viscose rayon staple at Mobile, Alabama, operated by Courtaulds Inc. In October 1959, Courtaulds North America Inc., New York, was formed with the object of exploring and developing opportunities for the expansion of Courtaulds' interests in the U.S. At the same time, Courtaulds North America Ltd. was set up in Montreal to explore opportunities in Canada, where Courtaulds are already producing reinforced glassfibre plastics, cellulose film and other plastics products besides viscose yarn and staple.

As a consequence of the new Koppers interest, Mr. A. W. Knight, a director of Courtaulds Ltd., and Mr. J. Albert Woods, chairman of the board of Courtaulds North America Inc., have been elected to the Koppers board. These developments follow discussions carried on over several months regarding the fields outside textiles in which technical, process and production know-how might be exchanged to mutual advantage between the two companies.

Koppers are among the 200 largest industrial companies in the U.S., with a

total capital of close on £38 m. In 1960, Koppers showed earnings of \$7.5 m., net sales of all products being \$300 m.—a 25% increase over 1959. Of this total, plastics represented some 17.5% (\$53 m.) giving place only to engineering construction (\$72 m.) and tar products (\$63 m.). Other Koppers activities include wood preserving chemicals, metal products, gas and coke, chemicals and dyestuffs. The main plastics products are styrene monomer, polystyrene, l.d. and h.d. polythene, polythene film and polystyrene panels for prefabricated buildings. The company employs some 12,000 people in over 70 plants in the U.S. and Canada. It also has overseas interests in Brazil, Argentina, Chile and Guatemala.

## Pfizer Offer Bulk Supplies of Lithium Hypochlorite

Lithium hydrochloride, a compound which is said to overcome the disadvantages of transport, storage and handling of hypochlorites, is now available in bulk from the Pfizer Group, Sandwich, Kent. The material is a non-deliquescent solid in free-flowing granular form, and has an available chlorine figure of 12%. It is readily soluble in water and gives no precipitation with soaps and detergents or in hard water. As with all hypochlorites, its maximum effectiveness is in the neutral range and it does not begin to lose its effectiveness until a pH of about 11. There is no risk of chlorine being produced at higher pH levels.



## Project News

# Laporte Know-how for Argentine Titanium Oxide Producers

**T**ECHNICAL advice from **Laporte Titanium** is being used for the production of titanium oxide, just started at Pilar, near Buenos Aires, by Titanit Compañia Industrial de Pigmentos y Afines. The Argentine firm, the only producer of titanium oxide in South America, aims at a production of 15,000 tons a year by 1966.

The Argentine company has been producing titanium oxide for many years on a small plant at Pilar. Under the agreement now entered into with Laporte, they will be able to modernise and expand their plant. The arrangement is on a royalty basis and L.I.L. will not be taking a financial interest in the firm.

## Avisco Know-how on Non-wovens for Japan

● A 49% interest in **Teijin Non-woven Co.**, Japan, worth 64.8 million Yen, has been acquired by **Avisco International** of the U.K. Teijin will use **Avisco** know-how for the production of non-woven fabrics.

## British Filtration Plant for Soviet Factories

● **FIRST** consignment of a filtration plant order totalling £140,000 is on its way to the U.S.S.R. to be installed in two beet sugar factories in the Ukraine, the manufacturers being **Eimco (Great Britain) Ltd.**, Gateshead. The order is part of a £7½ million contract awarded to **Vickers and Bookers Ltd.** for the complete supply and erection of the two factories.

**Eimco** are supplying eight rotary vacuum filters and four five-compartment tray thickeners together with receivers, pumps, drives and other ancillary equipment. The plant is part of a continuous carbonation process, the thickeners clarifying juice from the beet. The two factories, when in full production, will handle a total of 10,000 tons/day of beet.

## Beecham-Japanese Agreement On Penicillin Production

● **THE** Japanese Foreign Investment Council has approved a link between **Beecham Research Laboratories Ltd.** and **Meiji Confectionery** regarding the production of synthetic penicillin in Japan.

## Dunlop Japan Announce Major Expansion Scheme

● **PLANS** have been completed by **Dunlop Japan**, manufacturers of adhesives, tyres and other rubber goods, for a further major expansion of their Kobe and Nagoya factories. These plans, which cover new plant and buildings as well as the modernisation of existing plant, will cost £5 million over the next two years.

This will be financed partly from the

company's own resources and bank credits, and by an increase in the share capital of **Dunlop Japan** from £1,750,000 to £3 million. Japanese participation will increase from 29% to 50%, of which **Sumitomo Electrical Industries** will hold 40% and the **Long-Term Credit Bank** 10%.

## Expansion in Hand at Spondon Cracking Plant

● **NEW** plant as well as expansion of existing plants for **Courtaulds Ltd.** are discussed in the annual report and accounts for 1960-61 issued this week (see also 'Commercial News', p. 28). The new plant for carbon tetrachloride has come into operation at **Trafford Park**.

The petrochemicals unit at **Spondon** was expanded during 1960 and further extensions to the cracking unit, which are in hand, are due for completion towards the end of 1961. The vinyl ace-

tate unit was also expanded to meet increasing sales and a further extension is planned.

Further expansion of the acetate film and moulding powder units of **British Celanese** were put in hand during 1960 and are expected to be completed in 1961 and **British Cellophane** have brought additional capacity into operation at **Barrow-in-Furness** and work is in progress on still further expansion.

## Duperial to Use Natural Gas For Carbon Disulphide

● **Industrias Químicas Argentinas Duperial** are installing a 46-ton reaction furnace at their **San Lorenzo**, Argentine, plant for the production of carbon disulphide from natural gas. Output is estimated at 14,000 tons/year. **Duperial** are now a 100% subsidiary of **I.C.I.** Plans for **Duperial** to produce carbon disulphide were first announced in July 1959.

Currently, the West German **Courtaulds** subsidiary, **Glanzstoff Courtaulds, GmbH**, are associated with a plant to make carbon disulphide from natural gas (52,000 t.p.a.) in **Cologne**, using the **F.M.C.** process.

# Stuart Cutting-oil Concentrates Made in New Wolverhampton Plant

**A** NEW sulphochlorination plant for the production of cutting-oil concentrates, built under the guidance of **D. A. Stuart Oil Co. Ltd.**, but incorporating some new ideas, was opened at **Lincoln Street, Wolverhampton** for **D. A. Stuart Oils Co. (G.B.) Ltd.**, 11a, **Albermarle Street, London W.1**, a member of the **Amber Group**, by group chairman, **Col. D. G. N. Lloyd-Lowles**. The new plant will enable the British company to meet growing demands for these products at home, as well as in **Australia** and other **Commonwealth** countries.

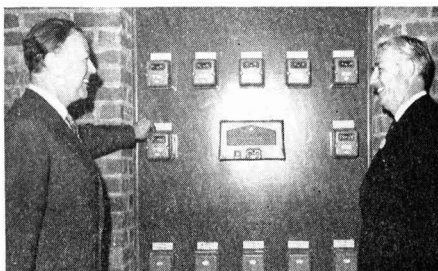
Previously **D. A. Stuart Oil Co. (G.B.)** have marketed cutting-oil concentrates produced in **Chicago** by **D. A. Stuart Oil**.

The new plant comprises two separate reactors for the sulphochlorination of fatty oils and mineral oils. Because of the extremely corrosive nature of some of the materials, a stainless steel feed pump and piping system are employed.

For both mineral oil and fatty oil con-

centrates a stepped chemical reaction is involved, but whereas the reaction is exothermic in the case of the fatty oils, and requires some cooling, an external heat supply is necessary for the mineral oil reaction. The mineral oil reactor is therefore provided with a thermostatically controlled gas fired heater.

In **Stuart** extreme pressure sulphochlorinated oil concentrates, sulphur and chlorine are chemically combined with the oil molecule. Under the high temperature generated at the point of contact between tool and workpiece, however, they are released to form a protective film, giving anti-weld and anti-wear properties. **Thred-Kut** type dark-coloured sulphochlorinated low-viscosity mineral oil concentrates are not only used for blending, but also as straight cutting oils for tapping, threading or broaching 'difficult' materials such as high strength steels and heat resisting alloys of the **inimonic** type.



**Col. D. G. N. Lloyd-Lowles**, chairman of the **Amber Group** (left) switches on the new plant. Right is **R. F. Middleton**, sales director, **Amber Oils**



★ THE Sheik of Kuwait is having his troubles. Doubtless after Kassem of Iraq's take-over bid, the criticisms of the international oil companies of his plans to get deep in petrochemicals will seem a minor problem. There is something in the oil company's objections—local Middle East markets are too small for economically scaled plants and Kuwait, like other Arab states that hanker after petrochemical installations to upgrade their exports, would find it difficult to compete against established producers in other markets.

It should be remembered, too, that the world's petrochemical markets are a long way from the Middle East. In any event, the Sheik is having to go it alone. His new company, Kuwait Petrochemicals, has been set up by his Government, with two local companies (Kuwait National Petroleum, and National Industries) and Ing. Oronzio De Nora-Impianti Elettrochimici, Milan, on the other.

Capital of \$45 million will be divided into 2 million shares—800,000 to be held each by the Kuwait Government and the Italian company, 100,000 by Kuwait Petroleum and 60,000 by National Industries; 240,000 shares are still available to other investors.

Initial production will be 200,000 tons/year caustic soda and chlorine, urea and p.v.c. from natural gas and petroleum by-products. This first stage is planned to be on stream by mid-1963 and two years later it is hoped to produce synthetic rubber, chlorinated products and carbon black.

★ CIGARETTES and mushrooms will be my diet after learning from a correspondent that Japanese research workers have discovered a substance in mushrooms which can combat the growth of cancerous cells. The substance was extracted from ground mushrooms by using acetone and methyl alcohol. The Japanese investigators also found that most of the 700 species of mushrooms examined contained this substance and believe that mushrooms eaten at meals should help to check growth in humans.

During tests, the substance was injected into 591 mice affected with cancer. Of them, 84 reportedly recovered, while the disease was checked in another 146 mice.

The discovery was the result of three years' joint research conducted by scientists of the Epidemic Disease Research Institute of Tokyo University, the Biology Department of Tokyo Medical

and Dental University, and the Tokyo Metropolitan Hygiene Institute. They are now trying to extract this substance in crystal form to determine its chemical composition. After this is done, tests will be made on humans.

★ ONE of the first effects of the withdrawal of South Africa from the Commonwealth has been the deferment of a decision by Rand Carbide Co. on their proposed major expansion programme at Witbank, Transvaal. The directors will wait until the effect of the withdrawal on the company's export markets—mainly within the Commonwealth—can be assessed.

Although the company's carbide furnaces operated to the limit of their capacity last year, mounting demand from overseas territories could not be satisfied. In spite of stiffer competition in some markets, a record tonnage was sold.

The new project, when finally sanctioned, will involve the installation of a second large furnace at Witbank and closing down a number of small furnaces.

★ OUR article in p. 15 on recent trends in benzole by Mr. R. A. Fraser, of Benzole Producers, coincides with the publication by the National Benzole and Allied Products Association (N.B.A.) of their new book 'Benzoles—Production and Uses'. This book is a successor to 'Motor Benzole, its Production and Use', written by W. H. Hoffert and G. Claxton and first published in 1931 and revised in 1938.

Since then developments in the benzole—or should it be benzene?—industry have been so great as to necessitate rewriting of the whole book. Appropriately, the book was introduced at a cocktail party held at the Savoy, London, on Tuesday, by Lord Fleck. Although he performed this duty as president of the Society of Chemical Industry, Lord Fleck has a long connection with benzene. This was the subject of the first paper of his to be published—by the Chemical Society in 1909.

★ PRODUCERS of aromatics and naphthalene from coke-oven gases in the U.S. are facing stiff competition from the vast plants which oil and chemical companies are setting up for petroleum-based benzene and naphthalene. At a

recent meeting of the American Coke and Coal Chemicals Institute, spokesmen of the U.S. Industrial Chemical Co. warned that at equal prices consumers would prefer the higher purity petroleum product. The coke-oven producers could only survive if they were willing to go further to upgrade their products.

U.S.I. estimated that a 10 million lb./year naphthalene plant would need a capital investment of \$50,000, direct operating costs would be 0.5684 cents/lb. A similar 50 million lb./year plant would need an investment of \$100,000, while direct operating costs would be 0.429 cent/lb. Direct operating costs of an acid-washed light oil was estimated at 0.862 cent/gall. in a 30,000 gall./day plant for which capital investment would be \$350,000.

For the coke-oven producer, the important factor was to compare the cost of sulphur treatment with that of dehydrogenation. Operating costs of the latter are generally lower, but it requires a heavier capital outlay.

★ IN their plans to boost acrylic fibre production from a current 22,000 tons a year to some 39,000, Japanese manufacturers are favouring use of the Sohio process in which propylene and ammonia are oxidised with oxygen to form acrylonitrile directly. First plants on stream used hydrogen cyanide units based on the formamide (carbon monoxide and methanol) and Andluso (methane, ammonia and oxygen) processes.

Nitto Chemical, Sumitomo Chemical, Mitsubishi Chemical and Toyo Koatsu are now producing acrylonitrile by the acetylene process. But new plants due on stream by Asahi Kasei Chemical, Mitsubishi Kasei and Nitto Chemical by the end of this year or early 1962 will use the Sohio process. This it is felt will help lower raw material costs and increase production of acrylic fibre. Mitsui Petrochemical, Toyo Koatsu and Sumitomo Chemical also plan to adopt the process, but Japan Gas-Chemical will use the Knapsack process, which is based on acetaldehyde.

With the £ currently valued at Yen 1,000, readers might like to do some mental arithmetic on the following cost of acrylonitrile by the Sohio process. Figures are yen/kg. of acrylonitrile: Raw material 88; manufacturing 49; less income from by-products 10; general admin. and sales expenses 15; interest on loan 17; licence fee 3; patent royalty 12. This makes a total of Yen 194 per kg. of product, but I learn from the Japan Chemical Daily Co. Ltd., that this figure is expected to be cut to Yen 150 in the near future.

*Alembic*

# Crosfield's Open 'Four-in-one' Sodium Silicates Research and Development Centre

OPENING of their new £750,000 centre for research and development work on sodium silicates at Warrington marks a further important stage in the £5 m. factory rebuilding programme of Joseph Crosfield and Sons Ltd. It also illustrates the increasing emphasis that Crosfield's are placing on the development of silicate products and the hopes they are pinning on this side of their business for the future. Since sodium silicate was first produced at Warrington some 100 years ago (initially for use in soap manufacture) the company has advanced to the point where it is responsible for 70% of the U.K. output of silicates. Crosfield's produced some 325,000 tons of silicate chemicals in 1960 compared with 125,000 tons in 1950.

As part of the £5 m. factory programme, which is due for completion in 1965, a £1 m. factory to manufacture detergents, silica gel and other chemicals was brought into production at Warrington in mid-1959 (see CHEMICAL AGE, 26 September 1959, p. 399).

The new research and development centre, covering a total area of 17,000 sq. ft., embodies a group of seven separate laboratories along with ancillary equipment and service rooms, a further important feature being a 60 ft. high pilot plant 'well'. This new centre enables Crosfield's to integrate four related departments—research, production development, quality control and technical sales service—formerly scattered over the company's site on the Lancashire and Cheshire sides of the River Mersey.

The work of the centre ranges over the whole field of silicate technology and into related 'user' areas. Apart from the day-to-day development of improved materials and production methods there is a heavy emphasis on long-term research, especially in the direction of fine chemicals with highly specific actions

which will up new applications of silicates and silicon compounds.

**Buildings.** The new buildings are based on the foundations of a former wharf warehouse and there are two principal blocks, of three and four storeys respectively, connected by a covered bridge joining the upper floors. The smaller of the two blocks houses the reception and administrative offices, library, conference room and other general facilities. Research and development are concentrated in the main block, the various laboratories being laid out in such a way that access between associated units is as simple as possible. The main analytical laboratory is divided into parallel sections, each dealing broadly with one subject, such as silicates, detergents, packing materials, oils and fats, soaps, and so on, while ranged along one side and directly connected to the main laboratory are a number of special laboratory units devoted to research and development of specialised fine chemicals.

## Large Facilities for Pilot Plant Work

The pilot plant section already referred to has a floor area of over 2,000 feet surrounding the central well on each floor. Almost the entire floor area can be made available for pilot plant by the removal of the steel plate flooring used in this part of the building.

**Services.** Mains water, gas, electricity and drainage lines are distributed in underfloor pressed steel ducts to which access can be gained at virtually any point, so that modifications in layout are easily made. Air conditioning is handled by a plant in the roof, which serves the entire building. Special provision is made for exhausting the very large number of fume cupboards, and for ventilating the high-temperature laboratory in which

development of refractories and other high-temperature processes is carried out in special ovens. For large-scale high-temperature and high-pressure work which cannot safely or conveniently be carried on in the main building, two special laboratories have been built nearby.

**Equipment.** The calibre of the equipment being used in the laboratories is best illustrated by a few examples: one of the instruments used to determine particle size and distribution is the Bostock sedimentation balance, while the Coulter counter is in use for obtaining absolute counts of particles in a suspension; for separating organic mixtures into their component parts the Pye argon chromatograph is available. Other important items of equipment in daily use include the name photometer and a large array of special laboratory apparatus, much of it developed and built in the centre's own well-equipped glass workshop. One spectacular item is a bank of titration burettes mounted on a back-illuminated Perspex panel, which makes for accurate and rapid reading.

The foregoing instruments and equipment are not reserved exclusively for research purposes, being used also for quality control. Equipment of the technical service department includes a complete rubber mill which has been installed for the operational performance testing of new types of fillers for rubber and synthetic polymers. In the course of preparation is a complete paint development laboratory, in which trials will be conducted on siliceous fillers.

A further feature of the technical service department is the special water supply system that is capable of reproducing the water supply of any local water undertaking in the country. The special supply is prepared in a water treatment plant which reproduces any required degree of hardness and the effects of local dosing practice.

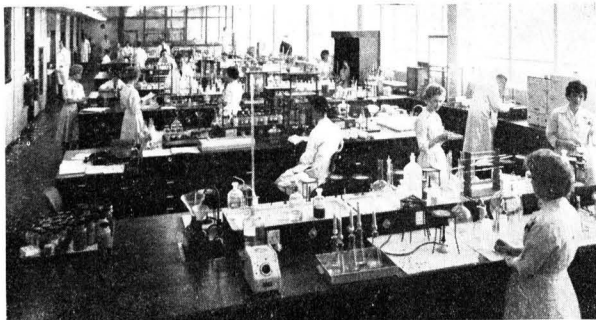
A feature of the quality control department is a system of power-operated, roof-high sliding bin racks for the storage of samples, enabling current materials to be compared with those produced in the past.

**Staff.** Total technical, operative and administrative staff of the centre is 200, technical and scientific personnel including a high proportion of fully qualified workers. Of the 70 men and women on the research side at the moment, for example, 55 are scientific staff, some 40 of these being of graduate level or higher.

Main contractors for the building of the new Centre were A. Monk and Co. Ltd., Warrington and London.

## New Glasgow Building for Garroway Ltd.

R. and J. Garroway Ltd., chemical manufacturers, Glasgow, have been granted Planning permission by the Glasgow Corporation Planning Committee for erection of a new single-storey building at 694 Duke Street, Glasgow, to function as a bagging, storage and despatch unit for chemical manufacturing purposes.



Main laboratory of Crosfield's new centre, viewed from the east, shows administration offices at the far end

**In Parliament**

# Minister of Power Agrees on Wilson Committee Plan for Gas

VIEW of the Wilson Committee that new plants would have to make gas more cheaply than existing ones, and the committee's recommendations for future development, have been accepted by Mr. Richard Wood, Minister of Power. This was stated in a written answer to Mr. G. Nabarro (Cons., Kidderminster) in the House of Commons on 23 June. (The Wilson Committee report was summarised in CHEMICAL AGE, 20 August, 1960, p. 281).

Mr. Wood said that in agreement with the Gas Council and the National Coal Board he had accepted the committee's recommendations that:

- The development of high-pressure slagging gasifiers should be pursued.
- The Gas Council should be responsible for further work on the standard Lurgi gasifier using British coals, on the Otto-Rummel gasifier and on any further gasifiers suitable for town gas.
- The Gas Council should be responsible for development work on slagging gasifiers.
- The National Coal Board should be responsible for work on producer gas plants.

He also accepted the committee's view that the prospects of making oil from coal economically in this country were so remote that no further technological work on the development of that process should be undertaken at present. As a result, the department of Scientific and Industrial Research has wound up its development work on that process. D.S.I.R. is, however, continuing basic studies on catalysis and is keeping in touch with developments in making oil from coal.

The Fuel Ministry has been carrying out research and development on the slagging gasification of coal as a means of providing the raw material for oil synthesis. The Ministry will continue this work until 31 March, 1962, when the Gas Council will become responsible for all work on the subject.

The Gas Council and N.C.B. are making a joint economic study of the possibilities of the Lurgi process, which might later be extended to include slagging gasification. That study, said Mr. Wood, would help to define the scope for further development of the process and provide a basis for further co-operation between the Council and the Board in the field of total gasification.

## Two New Area Experts Appointed for F.A.O. Fertiliser Campaign

HALF of the additional food which will be needed by the year 2000 to feed the estimated additional 3,000 million world population could be met by raising world fertiliser consumption from the present 23 million to 100 million tons a year. This was stated in Rome recently by New Zealander, Dr. H. L. Richardson, project manager of the fertiliser campaign being conducted by the Food and Agricultural Organisation.

Dr. Richardson was meeting two regional representatives who were recently appointed under this fertiliser programme. Dr. F. W. Hauck, a German fertiliser expert, is regional soil fertility specialist in West Africa, and Mr. M. Mathieu, a French fertiliser and extension expert, holds a similar post in the Near East. A third appointment will be made shortly to cover northern Latin America.

Dr. Richardson—on loan to F.A.O. from I.C.I.—explained that the fertiliser programme is aimed at expanding and improving the use of fertilisers wherever they are most needed. The project, which is being financed by the world fertiliser industry, is planned over a five-year period and was outlined in CHEMICAL AGE, 13 May, p. 767.

Dr. Hauck stated that it was cheaper to import fertilisers than to manufacture them locally, as long as they were only being used in small quantities. Large and steady demand must lie behind any move towards self-sufficiency in fertiliser production as, for instance, was now happening in India and Pakistan.

Both newly-appointed regional advisers have an extensive background in this field. Mr. Mathieu has been working with the Association for the Improvement of Agricultural Productivity since 1947 as regional technical adviser in the area around Poitiers, France, instructing farmers and running fertiliser demonstration trials, field experiments and soil testing.

Dr. Hauck was chief of the 'Overseas West' (American) Section of the Verkauftsgemeinschaft Deutscher Kaliwerke GmbH (German Potash Sales Organisation) from 1952 to 1960, in charge of research and extension work in the fertiliser field in Latin America. Then he was appointed director of the Baden Raiffeisenverband (a co-operative organisation in West Germany), with duties which included organising the distribution of fertilisers, machinery, seeds and plant protection materials for 2,000 co-operating farmers.

## Too Many Exhibitions Says E.F.T.A. Plastics Committee

AT THE second meeting of the policy committee of the plastics associations of the European Free Trade Association held in London recently, Finland was represented for the first time. Among the topics discussed were informative labelling, tariff classification, co-operation with E.E.C. plastics committees, and trade fairs and exhibitions.

Grave concern was expressed at the growing number of plastics trade fairs in Europe and the E.F.T.A. plastics associations have agreed to recommend their members to concentrate their support upon three such fairs during 1962 and 1963: Macroplastics, Utrecht (18 to 25 October 1962); Interplas, London (12 to 22 June 1963); Kunststoffe, Dusseldorf (19 to 22 October 1963).

## A.B.M.A.C. Directory Now Available

Newly available from the Association of British Manufacturers of Agricultural Chemicals, Cecil Chambers, 86 Strand, London W.C.2, is the *A.B.M.A.C. Directory, 1961*. The directory includes lists of names and addresses of member companies; a classified list of their products; common names for pesticides; the commonly used chemical names for crop protection chemicals cross-referenced to the common name; and proprietary and trade names.

## Wills

Mr. Maurice Barrett, retired consulting chemical engineer, who died on 6 April, left £34,622 net (duty paid £7,283).

## Trade with U.S.S.R.

(Continued from page 9)

(£511 million) three times up on the figure for 1958.

For all this vast development, the U.S.S.R. is well provided with raw materials. Oil production, which totalled only 3.8 million tons in 1920, last year reached 148 million tons and the current annual increase is around 18 million tons/year. By 1965 oil production is scheduled to total 230-240 million tons. Output of natural gas, more than 47,000 million cu. m. in 1960, is scheduled to reach 150,000 million cu. m. by 1965 and between 270,000 million to 320,000 cu. m. a year by 1970-72.

A policy of non-co-operation now cannot hope to turn back the U.S.S.R. policy of growth in chemicals, which are expanding at a greater rate than any other Soviet industry; it can only hope to provoke the trade war which Mr. Solvay seeks to avoid. On the other hand, encouragement of trade with the Soviet Union now is more likely to result in that country adopting normal methods of trade.



## Recent Trends in Benzole

# U.K. Pure Benzene Production Increased by 36 Million Gall. in 10 Years to 1960

**D**URING the past 10 years, developments in the British chemical industry, especially in the field of plastics, have increased the demand for pure benzene by over 300%. At the same time, quality requirements have become more stringent, all of which, coupled with the prospect of competition from petroleum-based benzene, have presented the British producers of benzole from coal carbonisation with a challenge which they have accepted.

The increase in quantity of pure benzene produced, from 11 million gall. in 1950 to over 47 million gall. in 1960, has been achieved partly by a diversion of the high-gravity crude benzoles produced by carbonisation in coke ovens to pure products instead of to motor benzole, the production of which dropped from 55 million gall. in 1950 to less than 30 million gall. in 1960. The expansion in the steel industry over the same period has necessitated increased coking capacity, with consequent increased production of crude benzole suitable for pure benzene production. The production of crude benzole from this source rose from 66 million gall. in 1950 to 86 million gall. in 1960. Furthermore, appreciation of the value of benzole as a by-product has resulted in an increased efficiency of recovery of benzole from the gas. This has been assisted by the use of instruments such as the Hanovia benzole meter, developed jointly by the National Benzole Co. Ltd. and Engelhard Hanovia Ltd., which depends on the absorption of ultra-violet light by the aromatic hydrocarbons (1).

**New Plants.** The increased output of pure benzene over the last 10 years would not have been possible without the enterprise of those works which have installed new and modernised refining plants for the production of this grade. Details of such plants are given in Table 1.

A typical modern benzole refining plant is that of the Appleby Frodingham Steel Co., at Scunthorpe. This was designed and erected by the A.P.V. Co. Ltd., incorporating their own continuous de-fronting unit for the removal of carbon

duct when used for the manufacture of toluene 2,4-diamine, the intermediate for polyurethane resins.

The possibility of applying continuous acid-washing to the treatment of benzole has not been overlooked. Some years ago the Midland Tar Distillers Ltd. applied a Holley-Mott type of plant to the refining of motor benzole. For high-gravity benzoles, however, the nature of the acid tar produced renders a more positive type of circulation necessary. The Alfa Laval process, in which the benzole and acid are pumped through contacting towers and separated in centrifuges has been operated for some time by Carless Capel and Leonard Ltd. The Norbenzol process, operated since 1955 by the Houillères du

By  
**R. A. Fraser, B.Sc., F.R.I.C.**  
Benzole Producers Ltd.

disulphide and cyclopentadiene. The content of sulphur as carbon disulphide in the benzene fraction is thereby reduced to less than 1 p.p.m. The defronted benzole is then passed through a continuous-distillation system comprising five columns, the first of which serves to dehydrate the benzole. From the remaining stages benzene, toluene, xylene and solvent naphtha are withdrawn. The plant is fully instrumented and equipped with warning and safety devices (2).

The products obtained from the continuous-distillation unit are refined with sulphuric acid. A most important discovery made at the Appleby-Frodingham works has recently been reported, resulting in the production of benzene with a sulphur as thiophen content of under 0.5 p.p.m. w/w; the sulphur contents are shown in Table 2. This has been achieved by the use of conventional batch washers, but with a very careful control over the time of reaction with the acid (3).

The benzene fraction has a boiling range (1% to 96%) of 0.15°C and a crystallising point above 5.4°C. The toluene fraction has a maximum benzene content of 0.02% and passes the stringent specification now required for this pro-

**Table 2**  
**ANALYSIS OF APPLEBY-FRODINGHAM PURE BENZENE**

Sulphur as	p.p.m. w/w max.
thiophen ... ..	0.5
Carbon disulphide ... ..	1.0
Elemental sulphur ... ..	0.5
Total ... ..	2.0

Bassin du Nord et du Pas de Calais, employs a turbine-type agitator, followed by settling in a large decanter (4,5). Considerable interest has been manifested recently in the use of columns in which the benzole and acid are contacted countercurrently by applying a pulsating movement to the benzole. In the Dutch State Mines process this is achieved in a packed column (6). The A.P.V. Co. Ltd., have also developed a pulsed-column process in which the column is equipped with perforated plates, the acid being dispersed in the benzene. It has been announced that a plant of this type is being installed at a works in this country (7).

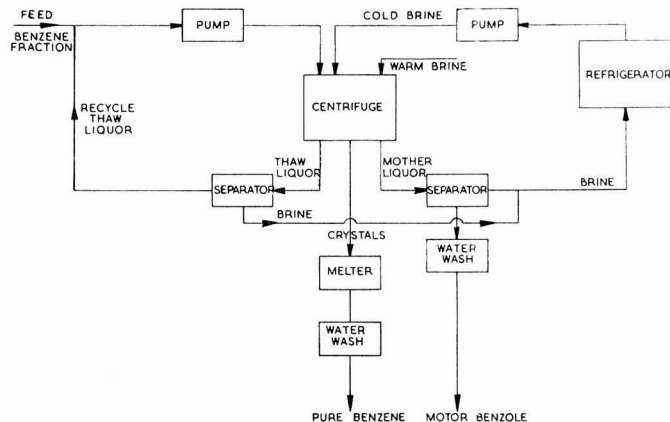
An alternative method for the removal of sulphur compounds from benzole is the use of hydrogen at a temperature of 300-400°C under pressures between 30 and 50 atm. in the presence of a molybdenum or cobalt/molybdenum catalyst. Such processes have been developed to a commercial scale in Germany and the U.S. Two plants have been erected in Britain, based on the Lurgi process. The first of these, which came on stream in 1958, was installed by Lancashire Tar Distillers Ltd., at their Cadishead works to refine low-gravity crude benzoles to motor benzole and water-white solvents, using hydrogen which is transported by road from a nearby chemical works; the second plant, which commenced operations in October 1960, is that of the Port Talbot Chemical Co. Ltd., which takes crude benzole from the adjacent coke-oven plant of the Steel Company of Wales and refines this to pure products using

**Table 1**

### NEW AND MODERNISED BENZOLE REFINING PLANTS

Works	Process	Annual Capacity for Pure Benzene	
		Million Gall.	Tons
Appleby Frodingham Steel Co.	Acid washing	2.5	10,000
Bairds & Scottish Steel Ltd.	"	1.0	4,000
Colvilles Ltd., Clyde	"	1.5	6,000
Colvilles Ltd., Ravenscraig	"	0.8	3,200
Dorman Long (Chemicals) Ltd.	"	7.0	28,000
Lincolnshire Chemical Co. Ltd.	"	5.0	20,000
National Coal Board, Avenue	"	3.5	14,000
National Coal Board, Manvers Main	"	5.5	22,000
Port Talbot Chemical Co. Ltd.	Hydrorefining	5.0	20,000
Total ... ..		31.8	127,200

## PROCESS FOR PRODUCTION OF PURE BENZENE BY CRYSTALLISATION



piped coke-oven gas as the source of hydrogen. The distillation section of the plant consists of a continuous column containing 74 Montz plates, from which a forerunnings fraction is taken overhead, together with a side-stripper containing 60 Montz plates, from the base of which pure benzene is drawn, having a crystallising point of up to 5.4°C and containing less than 2 p.p.m. total sulphur. Toluene, xylene and water-white solvents are also produced. One feature of the hydrorefining process that makes it attractive to a refiner is the absence of liquid effluent such as acid tar.

Another alternative to sulphuric acid treatment is the use of liquid sulphur trioxide instead of sulphuric acid. This is a project which is being actively investigated in the research laboratories of Benzole Producers Ltd., and promising results are being obtained.

*Separation of Non-aromatics from Aromatics.* In the course of hydrorefining any unsaturated hydrocarbons in the crude benzole are converted into paraffins and naphthene, which remain in the refined product, whereas in acid refining they are removed in the acid tar. In order to obtain high-purity benzene from hydrorefined feedstock it is therefore necessary to remove these non-aromatics. A similar problem arises when obtaining pure benzene from low-gravity stocks such as crude benzole recovered from vertical-retort gas. Four methods are available for achieving this separation: (1) superfractionation, as used at Port Talbot, (2) azeotropic or extractive distillation, which has been used for the production of toluene from low-gravity gasworks crude benzole, (3) solvent extraction which, in the form of the Udex process, using an aqueous mixture of glycols, has been applied on a large scale in the U.S. and (4) crystallisation.

A number of patents cover the use of crystallisation for the separation of *para*-xylene from other C<sub>8</sub> aromatic hydrocarbons. The application of this process to the separation of benzene from other hydrocarbons is the result of a joint research programme of Benzole Producers Ltd., the Coal Tar Research Association, and Newton Chambers and Co. Ltd. (8). Crude benzole, or a benzene fraction,

must be treated to remove thiophen, since this sulphur compound forms mixed crystals with benzene. The toluene content is then reduced to about 0.5% by a simple fractionation, for which a column of about 12 theoretical plates is adequate. This is necessary to ensure that the final product will pass the distillation clause of the specification. The crystallisation technique adopted has been developed to overcome the difficulties associated with lack of mobility of the crystal mass and consequent occlusion of mother liquor.

The feed is mixed with cold calcium chloride brine to form a slurry of benzene crystals and fed into a spinning centrifuge where separation of the benzene crystals occurs. The crystals are washed with cold brine, again centrifuged

and then ploughed out and melted. Alternatively, the crystals may be washed in the centrifuge with warm brine, thereby melting the surface layer and still further reducing the impurities. This thaw liquor is then recycled with the feed. A flow diagram of the process is illustrated. A product having a crystallising point above 5.4°C is obtained in high yield, together with a small fraction which may be used as motor benzole.

*Requirements for Benzene.* The increased demand for pure benzene has already been emphasised and some indication has been given of more stringent quality requirements. The crystallising point of No. 2 pure benzene was raised in the 1960 standard specification from 5.0° to 5.2°C, implying a product of 99.5% purity. This purity is required in such processes as alkylation and sulphonation to increase yields and reduce non-reactive recycle. At the same time there is evidence of a demand arising for pure benzene of very low sulphur content. This is required for use in processes using a catalyst sensitive to traces of sulphur, such as the production of cyclohexane for nylon manufacture. Recent demands for low-benzene toluene have already been mentioned. However stringent the specification required, it can be met from by-products of coal carbonisation.

## REFERENCES

1. Anon., *Coke and Gas*, 1956, 18, 279.
2. R. C. Dooley, *Coke and Gas*, 1960, 22, 403.
3. W. M. Hyslop, W. A. P. Carter, and E. Marsden, *Coke and Gas*, 1961, 23, 143.
4. Houillères du Bassin du Nord et du Pas de Calais, Brit. P. 686 536 (1949).
5. D. Bradley, *Gas J.*, 1960, 393, 341.
6. Stamicarbon, N.V., Brit. P. 824 914 (1957).
7. Anon., *Chem. Age*, 1961, 85, 207.
8. The Coal Tar Research Association, Brit. P. 846 172-3 (1959); Newton Chambers & Co. Ltd.; Fr. P. 1 241 916 (1960).

## New Solventless Epoxy Coating Withstands Rigorous Tests

A SOLVENTLESS epoxy coating, a two-pack cold cured system, has been developed by Lewis Berger (Great Britain) Ltd. Its main end use is in the specialist building, chemical, chemical engineering and petroleum industries for the protection of plant and structures which are exposed to severe chemical attack. These include tanks and pipelines.

The coating is most suitable for steel and concrete surfaces. Steel should be grit blasted, clean and dry, and concrete clean, dry and free from surface dust.

Because there is no carrier solvent, thick films of up to 20 thou. can be achieved with extreme chemical resistance and high mechanical properties. This new solventless formulation can achieve such thicknesses, when required, with one application. A further advantage is that painting can be carried out in confined spaces, such as tanks, without the need for forced air circulation to remove solvent vapours. It is, however, necessary for the user to employ breathing apparatus or similar protection under such extreme circumstances.

The new Berger coating is claimed to

have exceptionally high resistance to food acids, such as acetic and lactic acid up to 10% concentration, in addition to the known resistance of epoxy coatings to mineral acids, alkali solvents and oils.

This formulation has been used successfully on the steel and granolithic flooring of two nuclear reactors at the Bradwell nuclear power station now under construction. The surface at Bradwell must last at least 10 years without repainting and it must withstand alkaline and acid radioactive decontamination materials, including caustic soda.

## Obituary

**Mr. John Tedd**, 44, export sales manager of the Distillers Co. Ltd. Chemical Division, died on 27 June after a long illness. Mr. Tedd gained his B.Sc. degree at Belgrade University and qualified as a mining engineer at the Camborne School of Mines. He joined D.C.L. in 1957 as overseas sales representative to British Industrial Solvents Ltd.

## Interplas Convention

# Polythene Overcapacity Must be Met by New Product Development

IT must be assumed that a continuation of oversupply of low density polythene will exist for many years. This was stated by W. A. Woodcock (Union Carbide International Co.) when he addressed the Interplas Convention on the subject of 'World end-use and output trends in polyolefins'.

The demand for low density polythene in the U.S. exceeded 100 million lb. a year in 1952. In that year the worldwide usage of the product was of the order of 55,000 tons. Usage in 1961 may total as much as 850,000 tons. Low density polythene has been in short supply continuously since 1960 but a tapering of the growth rate together with a substantial increase in new plants has resulted in a producing capacity in 1961 which is approximately 40% greater than demand. Capacity available this year is estimated at 1.2 million tons and will total 1.55 million tons when the plants in various stages of construction are completed. There will then be plants in 16 countries of the free world.

Growth rate of the low density polythene industry between 1950 and 1960 has averaged 35% per year. In 1955, the amount of low density polythene consumed in the free world outside the U.S. was 48,000 tons; in 1961 the figure will be around 460,000 tons. This compares with U.S. figures of 46,000 tons in 1952 and 410,000 tons in 1961.

This burden of over capacity, said Mr. Woodstock, must be met by a continuing substantial effort directed towards the development of new uses and improved products.

### Price Cuts

The over supply situation of low density polythene has resulted in a cut in prices in the last 18 months. This has caused a drastic reduction in producers' profits and at the same time presents the user of polythene with a great opportunity to expand his business.

At present the end uses of low density polythene show the following picture in terms of percentage of the total free world production.

Film	45-46
General moulding (excluding blow moulding)	20-21
Pipe	7
General and cable insulation	11
Blow moulding	5- 6
Extrusion	7
Miscellaneous	3- 4

New markets and new uses are both necessary to correct the present day substantial imbalance between capacity and demand.

The position of high density polythene and polypropylene in Europe was dis-

cussed by Dr. G. H. Bausbach (Farbwerke Hoechst). High density polythene, first offered to the European market by Hoechst, was initially used in injection moulding. In this application it had the advantage over the low density product in that less material was needed.

High density polythene has not been accepted to the same extent in all countries. It has become more popular in Germany than in any other country; 25 to 30% of the total polythene consumed in Germany is high density. Dr. Bausbach gave reasons why he thought this situation had come about: high density polythene came on stream later in other countries than in Germany; an intensive sales campaign was started earlier in Germany; other countries were more advanced in the production of the low density material; and there existed the problem of adapting machinery designed for low density fabrication to deal with high density polythene—in Germany fewer moulds existed so that the capital loss involved in a changeover was not so great.

It is estimated that the capacity of

high density polythene in Europe in 1960 was 70,000-75,000 tons, 4/5 of which exists in the Common Market area and the remaining 1/5 in the European Free Trade Area. In 1961, the capacity will be increased a further 40 to 50%. Consumption figures are less reliable but it is estimated that consumption in Europe is between 60 and 70% of production capacity. The Common Market area consumes 2/3 of the total and E.F.T.A. 1/3. U.S. imports to Europe are about balanced by exports.

The price difference between high and low density polythene is so large that there has been an increased tendency to blend the two products in order to combine the advantages of lower costs and increased toughness. Increased production capacity will, however, decrease price. In Germany roughly 70 to 80% of the high density polythene consumed is used for injection moulding and 10 to 15% for blow moulding.

The 1961 capacity of polypropylene in Europe is between 40,000 and 60,000 tons. In spite of the high cost of polypropylene—it is 40% greater than high density polythene and 100% greater than low density polythene—Dr. Bausbach thought the material would be developed widely. There are many applications which would compensate for the price. Its temperature and chemical resistance, high surface hardness and good rigidity make it possible to use polypropylene in applications where plastics have not been used before.

## Improved Properties of Blended Polymers Help Extend P.V.C. Applications

VINYL polymers were subject of two talks: "Commercial trends in vinyl usage" by D. G. Owen and A. Renfrew (I.C.I.); and "Technical advances in the field of vinyl polymers" by J. J. P. Staudinger (Distillers Plastics Group).

The survey of commercial trends dealt exclusively with developments in polyvinyl chloride which is by far the biggest of the vinyl polymers and indeed the most widely used of all plastics. Current world capacity of polyvinyl chloride now exceeds 1.5 million tons and known projects suggest that this will rise to well on over 2 million tons in the near future.

Capacities and domestic consumption for p.v.c. in various countries were given:

	Capacity	Domestic Market
	tons	tons
Italy	140,000	60,000
Japan	330,000	220,000
Benelux	30,000	34,000
U.K.	115,000	110,000
Sweden	9,000	13,000
U.S.	640,000	373,000
France	115,000	82,000
Norway	8,000	6,000
West Germany	170,000	150,000
World	1,700,000	1,200,000

End uses of p.v.c. differ considerably in the manufacturing countries. For

example, outlets for unplasticised p.v.c. are high in Holland, Italy and Japan, but low in the U.K.

Although the hydrocarbon polymers have received most of the limelight at the research stage since the advent of the Zeigler-Natta catalysis, the Zeigler technique has also been applied to vinyl chloride in order to change the structure from a primarily amorphous polymer to a more highly crystallisable polymer. Many combinations of metal alkyls have been tried but to date no definite proof that vinyl chloride polymerises by the anionic co-ordination mechanism has appeared. It is, therefore, not yet possible from a practical point of view, to rely on stereo-regularity to give p.v.c.'s with improved properties. Progress, however, has been made in that direction using the more conventional methods such as copolymerisation, cross-linking, grafting and blending.

There appears to be one particularly promising possibility of the many for blending different polymers—that is the blending of a rigid polymer with a rubbery one in which the latter is the disperse phase. Several p.v.c. blends are already making their contribution towards extending the application area of plastics by the introduction of improved properties.

(Continued on page 21)

# Processing Progress in Producing Vitamin A for Livestock and Poultry Feeds

IMPROVEMENTS in the processing of *beta*-carotene, a source of vitamin A for livestock and poultry, have been made through a new fermentation technique developed by scientists of the U.S. Department of Agriculture.

This technique has more than tripled *beta*-carotene yields—from the 1957 rate of 0.5% of total solids produced to 1.7%. Also, the *beta*-carotene contained in the solids obtained by the new technique has an improved storage life and can be added to livestock and poultry feeds, especially as a low-fibre source of vitamin A.

Major changes in the process, developed at the Department of Agriculture's Northern Utilisation Laboratory in Illinois, include using more efficient strains of a carotene-producing mould and adding a deodorised kerosene to the nutrient solution, or medium, on which the mould grows.

The newest *beta*-carotene medium contains acid-hydrolysed corn (maize) and soya bean meal, thiamin hydrochloride, animal fat and vegetable oil, detergent, *beta*-ionone, and deodorised kerosene. Thiamin hydrochloride is a form of vitamin B-1, which the moulds require. The kerosene is primarily responsible for the yield increase.

The influence of kerosene hydrocarbons on *beta*-carotene production was reported last April at the annual meeting of the American Society for Microbiology in Chicago, by Alex Ciegler, George E. N. Nelson, and Harlow H. Hall of U.S.D.A. Northern Division research showed how to obtain sixfold increase in the practical storage life of

fermentation-produced *beta*-carotene. In one method Dr. Ciegler added a preservative to the fermentation medium or to the dried solids. In another, the dried solids were suspended in vegetable oil for protection from oxidation.

Carotene occurs naturally as an orange-yellow pigment in plant and animal tissue. It is extracted from plant sources or synthesised chemically and added to poultry and animal feeds as a source of pigment and vitamin A, required by all animals. It is converted to the vitamin in the animal liver. Carotene is also used in pharmaceuticals and to colour and enrich foods.

A high-potency carotene supplement, low in fibre, is needed in formulating mixed feeds—especially for poultry. Scientists at the U.S.D.A. Northern Division are conducting research to develop an industrially practical process that would use the carotene-producing abilities of certain moulds.

Their first success came in 1957 with the practical application of a technique for mating micro-organisms. Ralph F. Anderson and C. W. Hesselstine found that certain strains of the mould *Blakeslea trispora* can be grown together to yield *beta*-carotene in proportions of dry matter that exceed the proportion in ordinary plant materials. The mating phenomenon Dr. Anderson applied had been reported earlier by the West Virginia Agricultural Experiment Station.

In the Northern Division process, a grain-based medium is fermented by the mated moulds in aerated fermentors. Solids that contain carotene are harvested by filtration and dried.

## B.o.T. Congratulate Quickfit Group on Sales and Export Record

THE Quickfit group of companies, Staffs, manufacturers of scientific and industrial glassware, have received a bouquet from Mr. F. J. Erroll, Minister of State, Board of Trade, for their achievements in the export field. The companies—Quickfit and Quartz Ltd., of Stone, who make interchangeable laboratory apparatus, and Q.V.F. Ltd., chemical engineers in glass, of Stoke-on-Trent—export nearly 40% of their annual production.

Mr. Erroll has written to Mr. Brian H. Turpin, managing director of the Quickfit group, expressing congratulations and good wishes. He said: "It is always encouraging to hear of firms such as yours that are aware of the vital importance to this country of continuing expansion in our export trade. I know that the products of your Group of companies are by no means easy to sell in some overseas markets. I congratulate you and all

concerned and wish you every success in the future."

Sales of the Quickfit Group in 1946 totalled £50,000/year; by 1952 they rose to £325,000, and are currently estimated at £1.46 million. In 1961 they are expected to increase to over £2 million. During 1960 the Group's export sales were almost 2½ times greater than their 1955 total, and their scientific and industrial glassware has been sold to over 100 countries.

## Synthetic Rubber Production to Reach 2 million Tons

According to "Rubber Trends", published by Economist Intelligence Unit, synthetic rubber production in 1961 will reach almost 2 million tons, and total consumption will be slightly under 1.9 million tons. Natural rubber will broadly balance at just over 2 million tons.

## Head Wrightson's Sale of Cupola to Laporte

CUPOLA Mining and Milling Co. Ltd., acquisition of which recently announced by Laporte Industries Ltd., was formerly owned by Head Wrightson and Co. Ltd., who had been engaged in developing the business by the installation of a modern flotation plant to produce galena, barytes and high purity fluorspar. The plant was designed and constructed by Head Wrightson Minerals Engineering with a view to helping their diversification into minerals other than coal.

This was stated by Sir John Wrightson, chairman of Head Wrightson, in his annual report. Sir John added that the production and sale of those chemicals was outside the scope of their engineering interests so that when their neighbours, Glebe Mines, a Laporte subsidiary, approached them, Head Wrightson agreed to the sale of their complete shareholding. H.W. are, however, retaining the minerals testing station.

Head Wrightson Processes, whose sale of special products showed a significant advance over the previous year, have started a new department for effluent treatment in association with I.C.I.'s Allfoc Water Treatment Service. At Bradwell Nuclear Power Station, H.W.P. are handling a contract for the pond cooling and effluent treatment plants, the latter now embodying a dezincification unit to protect the oyster beds.

## New G.E.C. Company to Sell Process Control

A NEW joint British company has been formed by the General Electric Co. and Thompson Ramo Wooldridge of Los Angeles. Known as International Systems Control, the purpose of the new company is to market in the U.K., the Commonwealth and E.F.T.A., the use of the T.R.W. digital computer in industrial process control. The company will have headquarters in London and starts with a capital of £430,000 shared equally by the parent companies.

The T.W.R. control equipment is already operating in many U.S. industries, including Texaco's catalytic polymerisation unit, the B. F. Goodrich p.v.c. and basic chemicals plants.

Mr. O. W. Humphreys, technical director of G.E.C., is to be chairman of the new company, and Dr. D. N. Truscott, formerly general manager of the Electronics Division of G.E.C., is to be managing director.

## Fire at B.T.R. Moulded Hose Works

As a result of a fire on 21 June at the works of British Moulded Hose Co. Ltd., Watford, a subsidiary of B.T.R. Industries Ltd., there will be some dislocation in the supply of long length moulded and braided hose. An early assessment of the position indicates that damage to the production areas of the factory was less severe than elsewhere, and every endeavour is being made to restart manufacture as soon as possible.



# MAIN ACCENT AT INTERPLAS WAS ON NEW USES FOR PLASTICS MATERIALS

INTEREST at the International Plastics Exhibition (Interplas) held at Olympia, London, from 21 June to 1 July, centred not so much on new plastics materials, although there were some developments in the modification and improvement of existing products, notably in resins, copolymers and foams, but more on new uses for existing materials. Many of the 500 exhibitors are confident that the speed at which plastics are being taken up for newly developed applications and as replacements for other materials in existing applications, will accelerate in the next year or so.

Interplas once again demonstrated the virility of the British plastics industry and visitors could not but be impressed with the effort and expenditure that have been devoted by plastics raw materials manufacturers to the opening up of new uses.

In 1960, U.K. production of plastics totalled 560,000 tons, or 12% up on 1959, while U.K. consumption was up by 20%. Manufacturers are fully confident of the future, as witnessed by plant extensions in polythene, polypropylene and p.v.c. The current year should show considerable gains on 1960 figures, and by 1970 it is estimated that more than 1 million tons of plastics a year will be foamed, laminated, moulded or extruded in the U.K.

## Fall in Plastics Imports

Imports of plastics materials, a major embarrassment to U.K. producers in 1959, in the first five months of 1960 fell by 9% over the same period of last year; all categories of plastics imports were down, except polyamides and cellulose butyrate acetate. Disappointingly after earlier promise of higher figures, exports in the first five months fell by 5%; exports of polystyrene, however, showed a remarkable increase of 25%—this in one of the most competitive of the plastics markets.

Recent price cuts, of 15% in some polystyrene prices, and for polythene and polypropylene, are seen as strengthening U.K. producers against cheap imported materials and as making for wider usage.

More than 25% of the Interplas exhibitors were from overseas. Notable among them were **Fosfatbolaget**, Stockholm's Superfosfat Fabriks AB, who last year invested Kr32 million in new plants. They were able to tell visitors that a phenol modified melamine compression moulding powder would shortly be put on the market. This company has been greatly expanding recently and is now almost uniquely integrated, an example being: limestone, through carbide, calcium cyanamide, dicyandiamide, and melamine to melamine plastics.

Fosfatbolaget's output of dicyandiamide, which totalled less than 1,000 tonnes a few years ago, has expanded dramatically. A new plant was put to work last year and capacity is now to be raised by process equipment additions so that by the end of next year it will total 6,000 tonnes. Melamine capacity is also to be raised. A substantial increase in capacity for both melamine and urea resins will shortly come on stream.

In p.v.c., almost continuous expansion since 1949 has raised capacity 20 times to the current figure of 16,000 tonnes/year; recently decided investments will raise this figure to 25,000 tonnes. The next major development, now under construction, is a plant for the production of a paste-making polymer for the manufacture of coated fabrics.

Stepping into petrochemicals in a big way, Fosfatbolaget will use Svenska Esso feedstock and Union Carbide know-how to produce some 15,000 tonnes a year of polythene.

In foamed plastics one of the big talking points was the development of phenolic foam by **Bakelite Ltd.** This is thought particularly suitable for building operations on account of the 'outstanding' fire retardant properties and high strength retention of the foam at temperatures as high as 400°C. A colour film 'Phenolic foam for building' was shown at Interplas. To meet growing demand for the material, the Plastics Division of Spicers Ltd. is to distribute phenolic foam produced by Isofoam Ltd. to the building trade.

Phenolic foam is used as the core of a revolutionary glassfibre reinforced plastics signal relay station for British Railways. Shown by **Deeglas Fibres Ltd.**, it has an outer laminate of polyester reinforced with glassfibre with a similar inner laminate that has a low surface flame spread. Floor finish is p.v.c. sheet.

In polyurethanes, the **Baxenden Chemical Co. Ltd.**, Baxenden, Lancs. showed

their new spray formulation, Celspray 5-329. They also featured the Hydra-Cat, made by Gray Co. Inc., Minneapolis, a recently developed equipment to handle the airless atomisation of urethane foam, epoxy surface coating, and polyester resin/glassfibre. Baxenden are U.K. and Eire distributors.

**I.C.I. Dyestuffs Division** whose new large-scale tolylene di-isocyanates plant is due on stream shortly at Fleetwood, and who are currently importing large quantities to meet rising demand, showed a wide range of polyurethane foams made from their materials. **Lintafoam Ltd.**, High Wycombe, Bucks, attracted attention with their exhibit of garments insulated with polyether foam produced for the clothing industry. Clothes incorporating this process are washable and can be dry-cleaned.

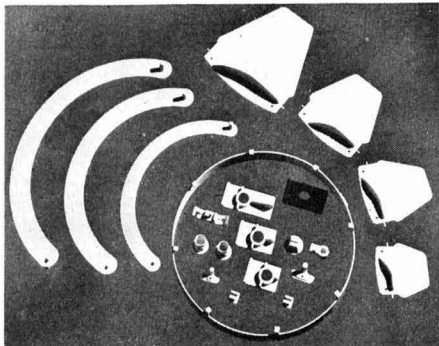
Another firm that showed foam interlock backing to Superlon X p.v.c. material was **Commercial Plastics Ltd.** Other recent developments of this group on show were Fablon p.v.c. film for rainwear, ABS and cellulose acetate butyrate, and metallised unplasticised p.v.c. film for Christmas decorations.

**Whiffen and Sons Ltd.** showed garments made in p.v.c. expanded by their Genitron AC. To illustrate this new development in blown plastics, the company featured self-coloured leathercloths.

Polythene featured widely both as a raw material, on the stands of U.K. producers and importers, and in an ever widening range of finished products. The only British producer of the high-density material, Rigidex polythene, showed how a large scale sales development and technical service programme, frequently carried out in close conjunction with users and potential users, has led to a big extension of applications. Shown for the first time was Rigidex high pressure pipe for cold water services. Made from Rigidex copolymer, a new material in



A vivid feature of the ABRAC section of the Albright and Wilson Interplas stand was a painting depicting the action of a phthalate plasticiser in a p.v.c. resin. Mr. P. Hopf, product development manager, Boake, Roberts, tries an explanation on his chairman, Mr. H. White, and Mr. S. Barratt, A. and W. chairman



Major new use for Du Pont's Delrin is in the many moulded components of this new Vent-Axia ventilating unit

the range, this pipe sprang from extensive research and development.

Rigidex was one of the main themes of the **Distillers Plastics Group** stand, where a special feature was made of blow moulding, showing how new grades of the material have solved many difficult processing problems. On this stand Distrene showed some interesting uses for foamed polystyrene including 'throw-away' cups for soft drink dispensers.

New polythene products shown by **U.S. Industrial Chemicals** included blown and cast films and rolls of polythene-coated substrates (foil, paper and Cellophane). Powder moulding, a growing technique, was stressed; this technique can be used to make large parts at relatively low cost and the material can also be used for the production of hollow objects by rotational moulding.

Propathene polypropylene was prominent on the **I.C.I. Plastics Division** stand—which had the theme 'I.C.I. plastics in building.' The first-ever cistern moulded in polypropylene was shown as well as fume ducting and water pipes.

One use for polypropylene, still in the development stage, is in milk bottles. **Fibrenyle Ltd.**, London N.W.10, who six years ago were producing 1 pint polythene milk bottles, found that they were not acceptable due to the abrasive problem. Polypropylene has a greater resistance to abrasion and unsightliness than polythene and a far longer 'journey-life' than glass; it has already passed sterilising, filling and capping tests.

One of the features at Interplas was the number of companies, home and foreign, showing nylon in its various forms. **Whiffen and Sons Ltd.** showed Ralsin polyamide pipe extruded to fine tolerances and resistant to all common chemicals, as well as being able to withstand both steam and ice. Ralsin coatings, for valves and other uses can withstand temperatures ranging from  $-40^{\circ}\text{C}$  to  $130^{\circ}\text{C}$ .

More exhibitors showed p.v.c. than any other plastics material; the exhibit of **British Geon Ltd.**, on the stand of the D.C.L. Plastics Group, featured the latest types of coating steel, including corrugated sections. British Geon showed the important role of flexible extrusions of p.v.c. hose in the proposed Magna pipeline which is to carry natural gas to Vancouver Island from the mainland.

Other new developments were a vinyl cloth in Geon p.v.c. and non-woven interlinings bonded with Hycar latex for the clothing industry.

The first textured decorative plastics laminate available in Britain, made by **Skanska Attikfabriken AB**, is marketed by Perstorp Products (G.B.), Ltd., Orpington. Perstorp also featured formaldehyde, hexamethylenetetramine, pentaerythritol, trimethylolpropane and lacquer resins.

Featured by **Leicester, Lovell and Co. Ltd.**, Southampton, was Resnit, the first pre-impregnated material capable of being used for the mass production of reinforced plastics components of complex shape.

Reinforced plastics were the theme of **Marston Excelsior Ltd.**'s exhibits, which included some of the components for the new high speed particle accelerator Nimrod, now under construction at the Rutherford High Energy Laboratory, Harwell. This will contain what is believed to be the largest reinforced plastics structure ever made.

An all-plastics container for the road transportation of hydrochloric acid or sodium hypochlorite, is one of the latest achievements of **Tough Plastics Ltd.**, Weybridge, and shown by Bakelite. Manufacture of the tank entails forming Vybak sheets to the required shape and supporting them with a glass-fibre laminate bonded with polyester resin. The grey, pigmented laminate is then given a coating of isocyanate resin.

Tough Plastics have been using this method of constructing chemical storage tanks for the past 2½ years; this, however, is only the second Tufplas road-tanker—the first was made for a German chemical company. The plastics road-tanker weighs about ½ ton, whereas a similar sized steel tanker would scale 2½-3 tons.

**British Celanese Ltd.** showed for the first time extrusion blow-moulded acetate containers. Blow moulded from standard Dexel and Forticel moulding powders on existing machinery, which needs only slight modification, the containers are impervious to petrol, resistant to hydrocarbons, have high impact strength and can be produced in clear colours. Main outlets are seen in sealed pre-packed motor oils, petroleum and lighter fuels, with possible end uses in drugs and cosmetics.

Powders for dip-coating featured by **Telcon Plastics Ltd.**, Orpington, now include cellulose acetate butyrate, p.v.c. and epoxy resins, the latter giving a convenient and economical fluid bed coating method for application to metal articles. Epoxy resins are the first thermosetting materials to be adapted to powder coating and a promising future is seen, particularly in the electrical and electronics industries.

In plastics sheet, Telcon showed polypropylene in thicknesses ranging from 0.020 in. to ¾ in., and in widths up to 55 in. Also in production is Telcovin TL, unplasticised p.v.c. sheet as a corrosion proof liner for acid baths, etc.

Two development products featured by Peter Spence and Sons Ltd., on the **Laporte Industries Ltd.** stand were titanium acetylacetonate, for cross-linking and curing accelerators, and bromophenyl glycidyl ether, a flame-retardant additive for epoxy resins. Organic peroxy compounds shown by Laporte Chemicals Ltd., included the newest developments for room temperature polymerisation of polyester glass fibre laminates. Other group exhibits included titanium oxide, cyclohexanone, methylcyclohexanone—solvents for vinyl polymers, Howflex solid and liquid plasticisers, and phthalic anhydride.

The only firm showing polycarbonates were **R. H. Cole and Co. Ltd.**, Caxton Street, London S.W.1, who featured Makrolon material from Farbenfabriken Bayer. Makrolon was also the subject of a film show during Interplas. Through their own manufacturing subsidiaries, R. H. Cole Plastics, Plastics Products and Lustrac Plastics, and from the plants of Monsanto Chemicals, Bayer, Siedison, Acme Resin and Lansil Ltd., Cole supply a wide range of materials.



Vacuum forming possibilities in Makrolon illustrated by R. H. Cole

including: cellulose acetate, methyl methacrylate monomer and polymer, polystyrene, polythene, p.v.c., vinyl acetate monomer, di-allyl phthalate, nylon 6, and polyurethane.

In the field of engineering plastics, **Du Pont Co. (United Kingdom) Ltd.** showed the first major U.K. application of Delrin acetal resin in domestic hardware, a field which is seen to represent a big end-use area. A large number of

Delrin components are incorporated in a new range of ventilating units made by Vent-Axia. Du Pont claim that their acetal resin is replacing both metals and other plastics materials in a wide range of applications in industry, transport and the home. This company has also developed seven new increased yield versions of its cellulose film for packaging uses.

The building industry is an obvious target for the development of plastics applications, but so far has proved slow to accept new materials. Moving in on this field are **Burn Brothers (London) Ltd.**, distributors of builders supplies, whose subsidiary, A. B. Plastics Ltd., have designed a new range of Terrain soil and waste systems, rainwater systems and ventilation systems. I.C.I. unplastified, unmodified p.v.c. is the material used. Aeroplastics Ltd. showed a range of 4 in. soil fittings in the Terrain system, said to be the largest injection mouldings made in Britain and to be the first comprehensive range of soil fittings in p.v.c. An interesting development is an access door moulded from polypropylene with a cadmium-plated steel insert and fixing screw.

Terrain rainwater systems, shown by Chemidus Plastics Ltd. incorporate a medium density polythene gutter jointing bracket that provides a 'push fit' joint for the gutter.

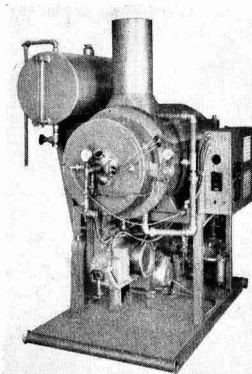
### Facia Panels

Also in the building field, **Microcell Ltd.**, a member of the B.T.R. Industries Group, showed for the first time glass-fibre reinforced plastics facia panels. Also new from Microcell was Plasticell, a closed cell expanded p.v.c. with high strength to weight ratio for use as the interlayer in sandwich constructions.

A new addition to the range of corrosion-resistant pipes and fittings made by **Durapipe and Fittings Ltd.**, currently made in high impact p.v.c. and high-density Zeigler polythene, is an ABS copolymer. There are now 450 different fittings, supplied plain for solvent welding or with standard pipe threads.

The development of Plastidry hose as high-pressure inflatable frameworks for the support of structures was introduced by **B.T.R. Industries Ltd.**, Herga House, Vincent Square, London S.W.1. Developed in co-operation with the Walter Kidde Co. Ltd., these structures can quickly be erected using either a portable air cylinder, compressor or small foot pump. Plastidry struts are made from a nylon or Terylene woven reinforced fabric to which is fused a cover and lining of p.v.c. compound—working pressure can be maintained for a year or more without attention.

B.T.R.'s recently introduced Synco p.v.c.-sprayed coating is resistant to a wide range of products, from alkalis to oxidising acids, from fatty acids and esters to hydrocarbons and alcohols. This coating is speedily applied in a thin film by a spray gun. Four to five spraying operations give a thickness of 0.20 in. to 0.28 in. This coating is diffusion proof



**Hi-R-Temp liquid phase heater exhibited for the first time in the U.K. by J. Stone**

and can be used under high mechanical stresses at operating temperatures up to 170°C.

**Plasinter Co. Ltd.**, Coleshill, have recently reformulated their MM/AD p.v.c. dispersion coating to improve its corrosion prevention properties. Their new formulation for MM/AD, MS/HC and p.v.c. spray dispersions are said to represent a significant advance. The air-drying materials, which can be applied on site, are strongly resistant to corrosive atmospheres in chemical works, oil refineries, etc., and are proof against most substances normally associated with p.v.c. plastisols.

Plasinter are expanding their interests in p.v.c. plastisols by installing equip-

ment for chemical plant, pipe work, etc. The company is finding increasing demand for its nylon finish which is largely resistant to trichlorethylene.

In the engineering field, **High Voltage Servicing Co. Ltd** showed radiation as a research and processing tool, exhibiting a new low-energy electron accelerator for process line polymerisation and sterilisation of plastics materials. Another development to attract interest was a new British-made blow-moulding machine which will it is claimed cut the cost of fabricating hollow plastics bodies of up to 8 cu. ft. volume by as much as 60%. These Emerson-Rudolph blow moulders are now being made under licence by **Emerson Walker Ltd.**, Gateshead.

The newly developed Hi-R-Temp liquid phase heater, not shown before in the U.K., was introduced by the boiler division of **J. Stone and Co. (Deptford) Ltd.** A forced circulation coiled tube type, direct-fired heater, it fully exploits the advantages of the heat transfer system. Output oil temperatures up to 600°F can be achieved. The pressurised combustion chamber releases about 1 million B.Th.U./cu. ft. of combustion space per hour.

Vyon, produced from high-density polythene, was illustrated by **Porous Plastics Ltd.**, by means of a working filtration and fluidising model which demonstrated fluidised powder handling by means of a powder pump, hopper and air fluidised conveyor in which Vyon is incorporated. A model filter unit supplied by Uhde, Dortmund, showed the use of Vyon in dust filtration.

## Technical Advances in Olefin Polymers

(Interplas Convention—Continued from page 17)

TECHNICAL developments of olefin polymers as a whole were dealt with by H. C. Raine (Imperial Chemical Industries Ltd.). The inherent flexibility of the polymerisation process has been exploited to introduce new variants which are based not only on modifications of the basic hydrocarbon structure but on copolymerisation. High density or linear polymers of ethylene are technically established, but there have been developments to yield products of lower density and greater flexibility by copolymerisation.

The technology of polypropylene

shows signs of becoming as complicated as that of polythene. Already applications for it are many and growing fast.

Large numbers of higher  $\alpha$ -olefins have been made and described but most of them remain scientific curiosities. Only poly(butene-1) has been produced commercially and this shows some interesting behaviour. With more research it is likely that other candidates will be chosen for evaluation, and if higher olefins, straight or branched, are commercially needed it is probable that economical routes will be devised.

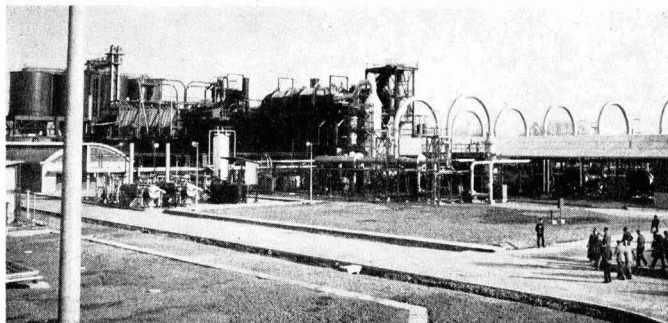
## Benn Directories for Far East, S. America

Two new Benn directories that give details of British-made products for export, including chemicals and chemical plant, cover the Far East and Central and South America and Spain. The second edition of *Benn's Far-East Directory and Buyers' Guide to British Industry* (price £2 2s, plus 2s for post and packing), includes a greatly expanded Chinese/English section, each entry referring to the page number of the English classified section. An alphabetical section gives details of U.K.

firms, in many cases with their Far-eastern agents.

The 1961 edition of *Directorio de Industrias Britanicas* is printed entirely in Spanish, giving details of British products for export to Latin America and Spain. The Buyers' Guide section has been much expanded and a new section gives details of the Latin American and Spanish agents of British manufacturers. Price is 30s. Both directories are obtainable from Benn Brothers Ltd., 154 Fleet Street, London E.C.4.

# ITALY HAS CAPACITY FOR 56,000 T.P.A. CARBON BLACK



The Treccate carbon black plant of Columbian Continental Europa S.p.A.

**C**ABOT ITALIANA, an affiliate of Cabot Corporation (U.S.) now produce a wide range of qualities of carbon black for the rubber, plastics, paints, inks and paper industries. Their plant, sited close to ANIC's plants at Ravenna has a capacity of 15,000 tonnes a year. It has been designed by Cabot Engineering Co. and it is the third to be erected by Cabot Corporation in Europe, following that built at Stanlow, Ches., in 1951 and that set up at Berre (France) in 1957.

It uses, as raw material, aromatic oils derived from refining of crude petroleum. Such oils are decomposed at high temperatures in special cylindrical kilns, while the addition of various quantities of certain substances regulates the quality of carbon black produced. The incorporation of air, oils, etc., is regulated automatically.

Gases charged with carbon black are cooled to about 250°C and then passed through cyclon separators and glass-fibre filters. After separation, carbon black is conditioned to increase its density and formed into spherical granules ready for packaging and shipping.

## Columbian-Continental

A larger (27,000 tonnes/year) carbon-black plant is operated by Columbian Continental Europa S.p.A. at San Martino di Treccate near Novara.

The shares of this company are held jointly by Columbian Carbon Co., New York, and Continental Carbon Co., Houston, Texas.

This \$6 million plant employs only 80 persons. It turns out three types of carbon black: ISAF, HAF, and FEF. The first two are used to increase tyre durability, while the third improves flexibility.

The new plant was designed in the U.S. but over 90% of the materials used were bought in Italy and only some specialised equipment was imported from the U.S. Edison Chimica acted as the major contractor.

Thermal cracking of hydrocarbons also constitutes the basis of the production cycle at this plant too.

Italy's third carbon black plant—that of Phillips Carbon Black Italiana, jointly owned by Phillips and ANIC is now being commissioned at Ravenna with a capacity of 14,000 tonnes/year. ANIC have a master-batching unit on their Europrene synthetic rubber plant at Ravenna and will use the carbon black for this purpose.

## Norsk Hydro Plan to Increase Exports of P.V.C. to Britain

**A**RRIVAL at Middlesbrough of a bulk cargo consignment of about 440 tons of p.v.c., shipped by the m.v. *Berwick*, marks a milestone in the U.K. operations of the Norwegian concern Norsk Hydro Elektrisk Kvoelstofaktieselskab, this being their first bulk import. With the advent of the European Free Trade Area, Norsk Hydro are expecting to expand their sales of p.v.c. in the U.K., already their largest market.

Since 1951, C. Tennant Sons and Co. Ltd., London, have handled the sales of the Norvinyl polymers. In the early days attention was focused on Norsk's paste-making resin P2, of which sales exceeded 2,000 tons and accounted for some 10% of the paste market here. In the past few

## Chemist Dies in Cyanide Gas Accident

MR. JOSEPH CLAYTON, a 37-year-old senior chemist at the Trafford Park, Manchester, works of the Ashburton Chemical Co., died as a result of a gassing incident involving cyanide gas at the works on 27 June. Seven other men were detained in hospital. The incident occurred in a production shed where hydrocyanic acid gas is produced. Passing workmen saw Mr. Clayton and the other workers staggering about the shed and rushed to their aid. Mr. Clayton died on his way to hospital.

Cause of the incident is under study.

## Lurgi Plant Opened by Queen

The first U.K. Lurgi gasification plant was opened at Fife on 28 June. The new high pressure plant was constructed at a cost of £6.5 million.

## Will

**Sir Roger Duncalfe**, former chairman and joint managing director of British Glues and Chemicals Ltd., and former chairman of the British Standards Institution Chemicals Ltd., and former chairman and president of the Association of British Chemical Manufacturers, who died on 15 April, left £128,172 net (duty paid £64,418).

years several new polymers have been developed, mainly for general purpose and calendering work. One in particular, Norvinyl S3-68, is reported to be finding increasing popularity, being an easy processing polymer with high plasticiser absorption. Substantial stocks of all grades of Norvinyl polymers are being held in the U.K.

Significant for the future is a current project to double production at the Heroya Works of Norsk Hydro, which by virtue of its cheap hydro-electric power and resources of other basic raw materials must rank as one of the world's most economical producers of p.v.c. Sales during this year are expected to exceed the 1960 figure.



Shipment of Norsk Hydro p.v.c. being discharged from the m.v. 'Berwick'



## Overseas News

### AMMONIA AND FERTILISER COMPLEXES PLANNED IN COLOMBIA

**A**MONIACO del Caribe (Amocar), an affiliate of International Petroleum (Colombia) will in July start construction of plants at Cartagena to produce 325 tons/day of ammonia and 167 tons/day of nitric acid. Amocar will export about 90 tons/day of ammonia to Central America; the remainder will be used by the fertiliser plants to be built at Cartagena by Compania Organizadora de Aboonos y Productos Quimicos (Aproqui).

These will comprise units to produce 400 tons of complex fertilisers and 250 tons of urea daily, mainly using feedstock from the Mamonal refinery of International Petroleum. Production will later be extended to include other fertilisers. Combined output of this plant and that of Industria Colombiana de Fertilizantes from their units in Barrancabermeja is expected to satisfy domestic demand. Aproqui shares are held by the Corporacion Financiera de Bogota, International Petroleum and the International Development and Investment.

Industria Colombiana were set up jointly by the Government, the Caja de Credito Agrario, the Federacion Nacional de Cafeteros, Instituto de Fomento Industrial and the Empresa Colombiana de Petroleos. Daily output of their plants at Barrancabermeja next year is expected to include 50 tons of ammonia and 80 tons of nitric acid, from which will be produced 100 tons of ammonium nitrate and 30 tons of urea a day.

#### Israel's First Formalin Plant in Production

Production started last month of the first formalin production unit in Israel. Situated at Atlith, near Haifa, the plant has an annual capacity of 3,000 tonnes. Operators are G.A.D. Chemicals Ltd., Israel, who have invested £1750,000 in the unit. The Atlith plant's production covers domestic demand for formalin.

#### Hoechst to Co-operate on Petrochemicals in India

A company entitled National Organic Industries Ltd. has been formed in Bombay, India, with its aim as the production of petrochemicals. The Indian concern will work in co-operation with Farbwerke Hoechst AG, Frankfurt.

#### Austrian Chemical Industry Output Rises 16%

Chemical production in Austria last year was higher by 16% than that recorded for 1959. With a 1960 production worth at the record level of Sch.10,300 million, the chemical industry displaced the textiles industry as Austria's second main industrial branch

behind food, drink and tobacco goods. Included in this 16% output rise was an increase of 7%, to Sch.468 million, in the value of pharmaceutical production, output of soaps and detergents falling, however, by 6% over the year. Austria's imports of chemical products were last year higher by 26.7%.

#### W. R. Grace to Open New Paris Office

W. R. Grace and Co., New York, are to establish a Paris, France, office for liaison with their extensive chemical operations in this country. The new office will not interfere with Grace chemical manufacturing plants in Europe which operate under the control of the Overseas Chemical Division, which controls six plants in Europe and elsewhere in the world.

#### New Fertiliser and Citric Plants for South Africa

Windmill Fertiliser of South Africa are to build a fertiliser factory near Sasolburg. It will cost about £2 million and will be built in stages. Windmill Fertilisers are a subsidiary of a Dutch company operating under the same name. Windmill also have plans for production in Salisbury, S. Rhodesia.

The South African company is also planning to build a plant with a capacity of 2,400 t.p.a. for the production of citric acid by a new process. The raw material used will be sugar cane molasses from the Natal north coast. The plant will cost an estimated £500,000 and is expected to be on stream in about 15 months. The machinery is being supplied by a West German firm.

#### Montecatini Know-how for Argentine Petrochemicals

An Argentine-European consortium is to set up a \$20 million petroleum-based fertiliser complex in Argentina, with know-how from Montecatini.

#### Japan Seeks Right to Bid on I.C.A. Fertiliser Deals

Under the current 'buy American' policy of the International Co-operation Association, Japanese fertiliser interests will not be able to bid for two Korean and Pakistani urea orders totalling about 400,000 tons of N.

The Japan Ammonium Sulphate Export Association has sent executives of fertiliser producers to Washington and Karachi to try to negotiate a reversal of I.C.A. policy. The association maintains that it would be uneconomical to buy ammonium sulphate from the U.S., since the American product costs about \$70

on, c.i.f., compared with \$46/ton for the Japanese product.

#### Mo Och Domsjo to Build Sweden's First EO Plant

Mo och Domsjo Aktiebolag has awarded a contract to Scientific Design Co. Inc., U.S., to design and engineer Sweden's first direct air oxidation ethylene oxide plant. The 33 million lb./yr. installation will be built at Stenungsund, site of the country's first petrochemical industry, previously discussed in CHEMICAL AGE. The company will also build an ethylene glycol plant designed by SD. The new plant will use the process, designed and licensed by SD, producing ethylene oxide by the direct air oxidation of ethylene. Mo och Domsjo becomes the fourteenth company to license the SD process.

#### Kellogg to Build New Argentine Refinery

Refineries Argentinas de Petroleo are planning an oil refinery in the province of Tucuman to process crude oil from Campo Duran. Output will be 60,000 litres of petrol a day and 6,000 k.g. of paraffin. Completion is scheduled within the next 18 months and the project will cost 150-200 million pesos. Main contractors are Kellogg-Panamerican Corporation.

#### New Refinery Planned in Portugal

Soc. Anonima Concessionaria de Refinacao de Petroleos em Portugal (Sacor) are seeking Government authority to construct an oil refinery at Oporto with an annual capacity of 1 million tonnes.

#### Zieren Carbide Plant for Bulgaria

The Bulgarian foreign trading organisation Technoimport, of Sofia, has ordered the construction in Bulgaria of a carbide plant by the Cologne, West Germany, chemical plant company Chemiebau Dr. A. Zieren GmbH. The carbide plant will, it is stated, form a base for the country's first p.v.c. unit.

#### Canadian President Urges Tariffs on All Imports

Mr. Robinson Ord, president of Canadian Chemical Company, Ltd., urged the Tariff Board to place a duty on all chemicals imported into Canada, regardless of whether they are competing with similar chemicals produced in that country. Such a duty, he said, would stimulate research and development of truly Canadian processes and speed up the manufacture of chemicals not now being made in Canada.

#### Better Urea from Modified Vulcan-Inventa Process

Modifications to the Vulcan-Inventa process and a new concentration technique have enabled Sohio Chemical to upgrade prilled urea produced at the plant which the company manages at Lima, Ohio, for Solar Nitrogen Chemicals. Short residence time and low-tem-

perature in the concentration stage, made possible by the use of a Stora-Vulcan falling-film evaporator combined with inert stripping gas, have led to a product with 33% less biuret than in competitive prilled ureas, it is claimed. Evaporation is carried out at just above the melting point of urea (271°F) and at around atmospheric pressure. The evaporator is mounted directly above the prilling tower and from the evaporator the dry concentrated urea melt drops through the prilling tower to form hard, dense prills that are cooled and screened. The need for drying equipment after prilling is eliminated.

### Bayer Give Details of Fibre Expansion Plans

Following reports in CHEMICAL AGE (15 April and 22 April 1961) that Farbenfabriken Bayer AG, Leverkusen, would be raising their synthetic fibre capacities by an unspecified degree, it is now announced that the increases will be to 25,000 annual tonnes of Dralon and 600 monthly tonnes of Perlon. Present capacities are of 17,000 annual tonnes of Dralon and 400 monthly tonnes of Perlon. First stage of the Dralon expansion will come into use before the end of 1961.

### U.S. Chemical Industry Expects Higher Profits

At the recent annual meeting in White Sulphur Springs, W. Va., of the Manufacturing Chemists' Association, it was stated that the future of the industry in the U.S. was viewed optimistically. Turnover is expected to be higher than the 1960 record figure of \$27,700 million and the level of profits, which last year was down by as much as 16% on the 1959 figure, is also expected to rise.

### Montecatini Urea Process for Ube Industries

Montecatini are to license their new urea process for a 120 tons/day plant planned by Ube Industries, Japan. This will be an addition to an existing Fauser type unit with a capacity of 48,000 tons/year. The new process is said to need less raw material, resulting in lower production costs and better quality. Patent licence fee to be paid to Montecatini is said to be \$240,000 with a contract effective for 15 years.

### Sonol to Build Oil Refinery in Israel

Sonol, established by Mr. R. Sonneborn of New York after Socony Vacuum withdrew from the Israel market, are to start construction soon on Israel's second oil refinery. To be located at Eilat, the refinery will produce 50,000 tons of refined products a year and will supply the southern part of Israel.

### B.A.S.F.-India Link for Polystyrene Foam

The Indian Government has approved the taking up by the West German chemical producers, Badische Anilin- und Soda-Fabrik AG, Ludwigshafen-on-Rhine, of a 50% holding in the Indian

concern R. A. Cole, Bombay. The Bombay firm will produce starting material for polystyrene foams by the B.A.S.F. Styropor process. Under German technical control, the company will supply the domestic market with its foams.

### Belgian Chemical Firms Form Planning Group

A number of Belgian chemical producers have jointly formed a planning company "for matters concerned directly or indirectly with the development of chemical industry". The new organisation bears the name of Société de Programmation Chimique (Planichim) and has been set up by Soc. Carbochimique, Compagnie des Métaux d'Overpelt-Lommel et de Corphalie, Pouderies Réunies de Belgique and Carbonisation Centrale. Entry to the company is open to other Belgian firms.

### Lacq Gas to Supply New Chemical Plants

A series of chemical plants based on Lacq natural gas have been opened near Pau by the French Minister of Industry. The £22 million capital was raised by Aquitainechemie formed by Pechiney, St. Gobain, l'O.N.I.A., Pierrefitte and the Banque de Paris et des Pays-Bas. The site chosen by Aquitainechemie is in an under-developed area of France in the South West. It is 5 km. from the purification plant and is also close to the Pechiney aluminium factory which supplied much of the constructional raw material. The eight plants, known as the Pardies Complex, will consume 600,000 tons of natural gas a day.

### Hungarian Fatty Alcohols Plant in Production

At Pé, in Western Hungary, the first sections of a plant for the production of

fatty alcohols have been brought into production on an experimental basis. When the unit is completed it will have an annual capacity of some 3,000 tonnes, or enough to cover domestic demand. Hungary has been importing increasing quantities of fatty alcohols due to the rising demand for synthetic detergents. Hungarian production of the latter totalled 6,188 tonnes last year.

### Reichhold in Joint Caribbean Plastic Venture

President of Reichhold Chemicals Inc., U.S., Mr. Henry Reichhold, has announced jointly with the Puerto Rican businessman, Mr. Adolfo Vilanova jr., the setting-up of a new company in the Caribbean area for the production of plastics and latex emulsions. The first of its kind in the area, the company will be called Reichhold Chemicals del Caribe Inc., and will work under licence from Reichhold Chemicals Inc.

### Solvay's Brazilian Associates Plan Polythene Plant

Petroclor Industrias Petroquimicas, São Paulo, Brazil, are building a plant for the production of polythene. It is planned to have an annual capacity of 63,000 tonnes by 1965. Petroclor are Brazilian associates of Solvay et Cie, Brussels.

### Houdriforming Unit Begins Aromatic Operations

A Houdriforming unit with a nominal design capacity of 6,000 barrels per-stream-day is now in operation at Teneco Oil's Chalmette, La., refinery. The unit was process designed by Houdry Process Corporation, Philadelphia, and engineered and constructed by Bechtel Corporation, Philadelphia. While designed for aromatic operations, the Houdriformer may also be used in gasoline operations.

## Production of Silicates in Italy

IN Italy, almost all sodium silicates are produced by smelting mixtures of quartz sand and sodium carbonate, while potassium silicates are obtained from mixtures of quartz sand with potassium carbonate. Italian producers are:

Alca, head office in Milan and plant at Palermo; Baslini, head office and plant at Treviglio; Fioroni, Milan; Montecatini, head office in Milan and plants in Milano-Linate, Arquata Scrivia, Leghorn, and Bagnoli; VE-RA, Vergani and Raimondi and Rescaldina; Lo Faro, Genoa; Caverni and Pecori, Leghorn; Filadelfo Fichera, Catania.

Potential output of sodium silicates of these plants is estimated to total about 45,000 tonnes a year. In 1960, 5,639 tonnes were also imported (of which 5,475 tonnes came from France). Exports totalled only 1,915 tonnes (of which 1,696 tonnes went to Lebanon).

Vitreous silicates of soda sell in Italy for about 30 lire/kg. They are used mostly as adhesives for cardboard (55%) and, to a lesser extent, for the production of detergents (20%), while the rest is utilised in the soap industry,

for bleaching, and in the flotation of minerals, etc.

About 3,000 or 3,500 tonnes a year of potassium silicates are used in Italy, of which between 17 and 30% are produced in that country, the rest being imported. In 1960, such imports totalled 2,453 tonnes (of which 1,332 tonnes came from Germany and 799 tonnes from France). Selling price in Italy of 33-35 Bé solution of potassium silicates is between 45 and 50 lire/kg.

About 95% of potassium silicates consumed are used in the production of electrodes, the remainder going into the manufacture of special paints, etc.

Sodium metasilicates are produced by Alcamir, Milan, Baslini and Montecatini to a total of 2,500 to 3,000 tonnes a year. They fetch from 40 to 50 lire/kg and are used almost wholly for the production of detergents. Imports are negligible and there are no exports.

About 2,100 tonnes of silicates of other types are imported, mainly from West Germany (1,654 tonnes) and the U.S. (307 tonnes).

● **Mr. John Gallagher**, general manager, and **Mr. James Woodhouse**, sales manager, have been appointed directors of the Monckton Coke and Chemical Co. Ltd.

● **Mr. Cyril G. Conway** has been appointed sales manager of Great Lakes Carbon International Ltd., 140 Park Lane, London W.1. His main responsibility will be to administer and extend, in this country and in Europe, sales of the graphite and carbon products manufactured by Anglo Great Lakes Corporation Ltd., Newcastle upon Tyne, and Great Lakes Carbon Corporation, New York. Mr. Conway has been with G.L.C.I. since 1958, most recently as branch manager of the London office.

● **Mr. J. E. C. Bailey, C.B.E.** who has been appointed to the board of Derbyshire Stone Ltd., will continue his executive duties in the Baird and Tatlock Group, as chairman and managing director of each of the operating companies—Baird and Tatlock (London) Ltd., Hopkin and Williams Ltd., and W. B. Nicolson (Scientific Instruments) Ltd., all members of the Derbyshire Stone Group.

● **Mr. H. R. Brooker** has joined the board of Johnson, Matthey and Co. Ltd., 73-83 Hatton Garden, London E.C.1, as a joint managing director. Previously general sales manager, he will continue to be principally responsible for all the company's sales divisions.



**Dr. A. M. McKay** (left) who as stated last week, has been appointed managing director of the I.C.I. European Council. (Right) **C. E. Waring**, manager of the new W. R. Grace Paris office (see p. 23)

● **Mr. H. J. Northeast**, general sales manager of Dunlop Chemical Products Division, Birmingham, has been elected chairman of the Midland Market Research Group for 1961-62.

● **Mr. A. T. Wilford, F.R.I.C.**, director of research, London Transport, retired on 30 June at the age of 68. Mr. Wilford was educated at Wilson's Grammar School, Camberwell, and obtained his degree at the Imperial College of Science and Technology. He entered the service of the former Underground companies in 1920 as chemist with the London General Omnibus Co. and became chief chemist in 1926, a post which he continued to occupy under the London Passenger Transport Board. He became Superintendent of Laboratories when the

## PEOPLE in the news

Laboratory Services of the London Transport Executive were centralised in January 1949, and in May 1950 has been appointed to the new post of director of research. He is the author of a number of papers on the use of fuels and lubricants in road service vehicles.

● **Mr. C. W. Moss** has been appointed assistant director-general of the Process Development Department, National Coal Board. The department was formed in April 1959, under Dr. J. Bronowski, to further the development of new processes for treating coal. From 1945 to 1951 Mr. Moss was with CIBA Ltd., where he was concerned with the layout of synthetic resin plant and the development and application of metal bonding processes. Between 1951 to 1958 he was with the I.C.I. Billingham Division for three years in the engineering development department, for a further three years as an engineer connected with the anhydrite mine, and latterly in connection with the Portland cement plant.

● In the reference to the award of the O.B.E. in the Birthday Honours (C.A., 17 June, p. 984) to **Mr. J. F. Hirst**, Senior Principal Scientific Officer, Laboratory of the Government Chemist, Mr. Hirst's initials were incorrectly given as "F. F."



The deputy mayor of St. Marylebone, Lt.-Col. **W. A. N. Hammond**, being received by **Mr. J. H. Kenney**, president of Foster Wheeler Corporation, and **Mr. C. E. H. Verity, O.B.E.**, managing director of Foster Wheeler Ltd., at the official opening of the new Foster Wheeler House, a 17-storey building in Chapel Street, London N.W.1. Some 100 guests attended the opening ceremony

● **Mr. Samuel Turover**, manager of European marketing research for Monsanto Chemical Co.'s Overseas Division at Geneva, Switzerland, has been appointed sales manager of Monsanto Belgium S.A. at Brussels. The Belgian company is a subsidiary of Monsanto Chemical Co., St. Louis, Mo., and was formed in 1960 in partnership with Soc. Industrielle de la Cellulose (SIDAC) of Brussels to produce Monsanto's Safflex polyvinyl butyral sheet used in laminated safety glass.

● **Mr. H. H. Woolveridge**, chairman of the Distillers Plastics Group, has been appointed chairman of British Geon Ltd. and of Distrene Ltd. Other changes in the D.C.L. Plastics Group are: **Mr. P. A. Delafield**, deputy chairman, Distillers Plastics Group, and deputy chairman British Resin Products Ltd.; **Mr. E. J.**



**H. H. Woolveridge**



**P. A. Delafield**

**Westnedge**, managing director, Distillers Plastics Group, managing director, British Resin Products Ltd., director of British Geon Ltd. and of Distrene Ltd.; **Mr. J. D. Winston**, sales director, Distillers Plastics Group, and director of British Resin Products Ltd.; **Mr. P. C. E. Kirby**, export director, Distillers Plastics Group, and director of British Resin Products Ltd.

● **Mr. H. W. Jones**, formerly group manufacturing manager of Aspro Nicholas Co. Ltd., has joined Process Plant Contractors (Campbell) Ltd. as technical manager.

● **Mr. G. E. Timms** has been appointed chief engineer of the Silvertown (London) factory of B.T.R. Industries Ltd. Previously with the Distillers Co. Ltd., he has had considerable experience in factory engineering services.

● Additional directors appointed within the Geigy Group of companies with effect from 1 July include the following: **Geigy Co. Ltd., Mr. L. R. Dowsett, Mr. A. Hill, Mr. T. W. Parton and Mr. J. Smethurst**; Geigy Pharmaceutical Co. Ltd., **Dr. R. H. Gosling and Mr. S. W. Kipling**; Ashburton Chemical Works Ltd., **Mr. K. M. Townsend and Mr. B. J. Warr**; James Anderson and Co. (Colours) Ltd., **Mr. T. Gibson and Mr. K. G. Hargreaves, Viscount Rochdale**, who is a member of the board of Geigy (Holdings) Ltd. will be succeeding **Mr. A. H. Whitaker** as chairman of the subsidiary James Anderson and Co. (Colours) Ltd. on 1 July. **Dr. F. Buchmeier** was recently appointed deputy chairman of that company.

## Bookshelf

# Useful Reference Source to Ion-exchange Materials

SYNTHETIC ION-EXCHANGERS, 2ND EDITION. By G. H. Osborn. Chapman and Hall, London, 1961. Pp. x + 346. 50s.

As its main features, this handy reference book surveys the current types, characteristics and uses of ion-exchange resins. These objectives are achieved by arranging the material into two sections. In the first of these, accounts are given of commercial resins by means of tables and short comments followed by a set of chapters on the main practical aspects. These cover analysis, reactions with low solubility materials, ion exclusion and retardation, membrane phenomena, therapeutic applications, trade effluent, the production of de-ionised water, catalysis, and a few large-scale production processes. Each chapter is sub-divided so that "hunting" is reduced to a minimum.

The second half of the book is a bibliography of selected references on applications (about 3,000) arranged under topics in alphabetical order; they range from acetalisation to zirconium. These are followed by about 350 references to articles on theoretical treatments.

All practical chemists will find this is a most useful reference source for it is a convenient summary of the vast and ever-increasing uses of ion-exchange materials.

## ▶ Analytical Chemistry

TREATISE ON ANALYTICAL CHEMISTRY, PART II, VOL. 1. Edited by I. M. Kolthoff, P. J. Elving and E. B. Sandell. Interscience, New York, 1961. Pp. xxii + 471. 120s.

This is the first volume to be issued of a vast projected work. The scale can be realised from the statement that this is the first volume (of seven) that will cover Section A, the quantitative analytical chemistry of the elements in inorganic compounds (B and C cover organic compounds and qualitative analysis). The three sections together form Part II which will be preceded by a Part on Theory and followed by one on Industrial products.

Six authors are needed to cover inorganic nomenclature, hydrogen, water, inert gases, and alkali metals. Clearly the number of writers required for the work will be great and it is not surprising that in their preface the editors express doubts about their ability to extract all the manuscripts on time. There is obviously going to be considerable duplication for Part I will deal extensively with physical methods such as mass spectrometry and gas chromatography which are briefly reviewed under "Inert Gases". Rather disconcertingly one paragraph begins 'Read

the instructions provided with the mass spectrometer . . .'

The authors have clearly tried to make each section of a few pages self-contained so that the work can readily be used to find an analytical procedure suitable for a particular purpose or equipment. They have supplied full references. The amount of information presented in a convenient form is indeed immense, but this is not a book that can easily be read for general enlightenment. A volume for the large reference library.

## ▶ Scientific Writing

SCIENTIFIC THINKING AND SCIENTIFIC WRITING. By M. S. Peterson. Chapman and Hall, London; Reinhold, New York; 1961. Pp. viii + 215. 56s.

Most books that aim to instruct scientists in the art of writing devote much of their space to grammar, syntax and usage. Dr. Peterson principally concerns himself with subject matter and its arrangement. This approach has much to commend it. One of the difficulties of teaching school children how to write is the problem of finding something for them to write about. Consequently scientists often do not learn to write until they come to express their first original work in publishable form. This text emphasises the point that the best writing frequently comes from those with the best understanding of their subject. Clear thought must precede clear expression.

Different forms of publication call for different presentations. Much space is devoted here to extended examples of articles, reviews, talks, etc. These are not always well chosen or well written but generally serve to illustrate the writer's point. His own prose style is not pleasing.

The book is far from perfect but it makes many good points and should stimulate useful thought.

## ▶ Liquid Diffusion

DIFFUSION AND HEAT FLOW IN LIQUIDS. By H. J. V. Tyrrell. Butterworths, London, 1961. Pp. xii + 329. 65s.

Scientific literature is never likely to suffer from a superfluity of the type of monograph under review. The production of such critical and careful works by devoted authorities is the best, and probably the only answer, to the rising tide of publication. Good monographs are much more convenient than the best impersonal compendia.

The statistical theory of the liquid state

is unsatisfactory. Consequently the author considers his subject in terms of non-equilibrium thermodynamics, the principles of which he reviews in a chapter which follows an introductory survey. In later chapters every effort is made to relate the rather abstract arguments, which may deter some prospective readers, to the experimental studies. Thermal and mass diffusion are first considered together with the appropriate thermodynamic treatment. The remainder of the book is divided approximately equally into three chapters on mass diffusion and four chapters on thermal diffusion and thermal conductivity of liquids. The book is well produced and illustrated at a low price considering the difficult type-setting involved.

It is interesting to note that diffusion is a further example of a field of research, traditionally physics, which has been annexed by chemists.

## ▶ Chemical Processes

MODERN CHEMICAL PROCESSES, VOL. 6. By The Editors of *Industrial and Engineering Chemistry*. Reinhold Publishing Corp., New York; Chapman and Hall, London. Pp. 126. 48s.

This volume, like its predecessors, contains a series of articles describing recently developed chemical processes now in operation in the U.S. Each article follows the pattern laid down in the other five volumes, describing as it does the background, plant installation, process and operation of the plant, economics of the process, plant investment and amortisation, and future prospects.

There are 17 articles in volume 6: Manufacture of basic silicone products; Chemicals from wood; Derivatives of acrolein and peracetic acid; Pentaerythritol; Fluidised bed roasting ovens; Grignards for commerce; Detergents continuously; Design and construction of a phosphate insecticides plant; Catalyst manufacture; Partially acetylated (PA) cotton; Silica-alumina petroleum cracking catalyst; Speciality surfactants; Glycols and ethanolamines; 2,4-D: weedkiller and derivatives; Acrylates and methacrylates: raw materials, intermediates and plant integration; Acrylates and methacrylates: ester manufacture and markets; and Chemicals from acetaldehyde.

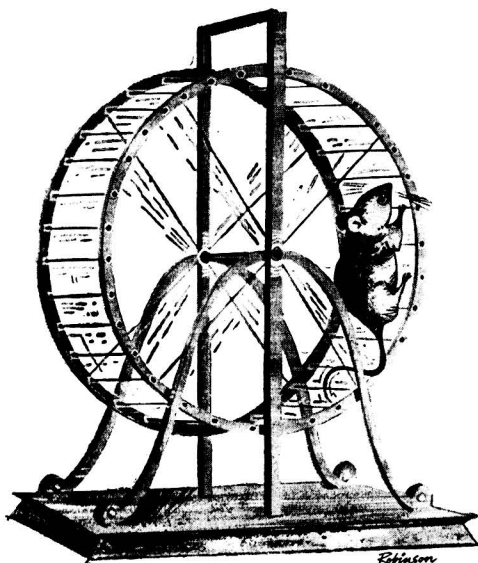
## Technological Award Council Moves

Address of the National Council for Technological Awards has been changed to 24 Park Crescent, London W.1. (Langham 4879.)

## Activities of Younghusband Stevens

In addition to being producers of fatty acids, as mentioned in C.A., 17 June, p. 999, Younghusband Stevens and Co. Ltd., London Road, Barking, are also vegetable oil refiners and processors, including the manufacture of stand oils and blown oils.





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## Commercial News

### B.D.H.

The proposed arrangement between British Drug Houses and Mead Johnson and Co. (see page 10) provides for the bulk of the £5 m. fresh money to be obtained from unsecured convertible notes carrying an interest rate of 5%. These will be unconvertible for 3½ years, then convertible into ordinary shares at the equivalent of 26s/share, and finally redeemable, if not converted, in 7½ years' time. The balance of the money will come from an issue of 'B' ordinary shares which—except for voting rights—will rank *pari passu* with B.D.H. existing Ordinary shares and will be taken up at 25s/share.

Among other proposals of the B.D.H. directors is the introduction of an interim dividend, beginning with the year ending 31 December 1962.

### British Glues and Chemicals

Group net profit of British Glues and Chemicals for the year ended 31 March 1961 was £311,219 (£252,905) and dividend 22½% (same). An increase in fixed assets was due to redeployment of resources, arising in the main from acquisition of additional gelatine manufacturing company and erection of factory unit for production of vegetable proteins.

### Courtaulds Ltd.

For the first time Courtaulds Ltd. have published a group sales figure and for the year ended 31 March this was £171.9 million, or a 23% rise on the 1959-60 figure of £139.9 million. The directors' report states that sales were higher than in 1959-60 even if sales of Pinchin Johnson and Associates are not taken into account.

Although sales were up, difficulties in some fields led to reduced profits, group trading profit, at £15 million being down 20%. Dividend from British Nylon Spinners Ltd. totalled £1.47 million (£1.1 million). See also pages 10 and 11.

### I.C.I.

Arrangements have now been completed for the acquisition by I.C.I. of Hollandsche Gummifabrieken Weesp, producers of plastics sheets and film and p.v.c.-coated fabrics. I.C.I. have acquired the whole of the issued share capital, comprising 83 ordinary units of Fl.1,000 each and 360 founders' shares of no par value, for an estimated £500,000.

### Greeff-Chemicals

While the volume of the operating company's own trading profit in the current year is so far only slightly less than in 1961, trading margins are smaller and expenses continue to rise, said Mr. S. B. Smith, chairman of Greeff-Chemicals Holdings Ltd. in his report for 1960.

- U.S. Link Will Give B.D.H. £5 M.
- Courtaulds Group Sales Higher By 23%
- Montecatini Jan.-April Income Up By 11%
- French Merger Proceeds "As Planned"

The board is constantly exploring new fields and looks to the future with confidence. Trade investments in British Titan Products, Minnesota Mining, Philblack and Barking Zinc Oxide, have been revalued at £2,945,475, a surplus of £1,588,995 over the previous book value. Trading profit for 1960 was £73,643 (£94,753); income from trade investments was £183,468 (£150,248) and pre-tax net profit was £257,111 (£245,001).

### O. and M. Kleemann

A formal offer has been made for the ordinary and preference capital of O. and M. Kleemann by Mobil Holdings Ltd. It is announced that the directors and shareholders holding 42% of ordinary stock intend to accept.

### B.P. Benzin- und Petroleum

The West German subsidiary of British Petroleum, BP Benzin- und Petroleum-AG, Hamburg, who with 50% of the shares of the Dormagen petrochemical company, Erdölchemie GmbH, are one of Germany's leading concerns in that sphere, announces a net loss of DM9,550,000 for 1960. Added to the loss recorded in the previous years, this gives a cumulative company loss of DM19,610,000. The loss was in the face of a 23% increase in turnover, from DM1,034 million to DM1,274 million.

### Dead Sea Works

Agreement to purchase a block of ordinary shares in Dead Sea Works for private placing outside Israel and the U.S. has been made by merchant bankers N. M. Rothschild and Sons and S. G. Warburg and Co. The shares are part of an issue by Dead Sea Works of 27 million new ordinary shares, the issue being conditional on ratification by the World Bank and a U.S. bank of long-term loans to the company totalling \$35 million. The issue and loans will raise \$50 million, which will be used in conjunction with a major extension programme to increase production of potash, bromine and salt and to build plant for the production of magnesite.

### Montecatini

At a recent meeting in Ferrara of Montecatini's administration council, it was reported that in the first four months of the current year, group income totalled 129,272 million Lire or some 11.3% more than in January-April 1960. Plants at Codogno are due to go on stream in a few weeks; the petrochemical units of the associated Danubia in Vienna will start production in July, while the Novamont, U.S., polypropylene plant is

due on stream in September. Some of the Brindisi plants will start operating early in 1962, while construction of the plant at Follonica for processing Maremma pyrites is already in production. (See also C.A., 3 June, p. 587.)

### Geigy International

Geigy International, Basle, who were set up in May with share capital of S.Fr.10 million held by J. R. Geigy, Basle, are issuing a 15-year loan at 3½% for S.Fr.30 million.

### Pechiney

The merging of the chemical interests of Pechiney with those of Saint-Gobain have proceeded as planned, starting with the fusion of their commercial activities, which have been passed over to a new jointly owned subsidiary, it is stated in the annual report of Pechiney. Pechiney continued to produce a wide variety of chemicals in 1960, total sales increasing by 26.8%. A pilot plant, set up to study the small-scale industrial production of aluminium by the new 'carbo-thermic' process, has been operating at full capacity since last January.

### Pfizer

Pfizer, U.S., are to acquire Paul-Lewis Laboratories Inc., manufacturers of enzyme products in exchange for 60,000 Pfizer shares.

### Progil

Net profit of Soc. Progil for 1960 was N.F.4,984,000 (N.F.4,182,000). Dividend is maintained at N.F.4.48.

### NEW COMPANY

LONDON TAR AND CHEMICAL CO. LTD. Cap. £1,000. To deal in and manufacture tar, tar and chemical products, petroleum products, etc. Subscribers: North Thames Gas Board and James Burns (deputy chairman, N.T.G.B.).

### INCREASES OF CAPITAL

ASSOCIATED ETHYL CO. LTD., 20 Berkeley Square, London W.1. Increased on 12 December 1960, by £4 million, beyond the registered capital of £6 million.

KAY LABORATORIES LTD., 49A Oxford Road, London N.4. Increased by £72,000 beyond the registered capital of £28,000.

PÉCHINEY, Paris. Capital to be increased from Fr.423,304,600 to a future maximum of Fr.850 million.

A. F. SUTER AND CO. LTD., shellac and gum importers, etc., 15 Philpot Lane, London E.C.3. Increased by £20,000 beyond the registered capital of £40,000.



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A million tests a year safeguard the consistently high quality of the many chemicals produced by DCL. 200,000 tons of Bisol solvents, intermediates and plasticisers leave the DCL factories every year, a production matched by a streamlined service and supply organisation. The Technical Services Department has well equipped laboratories specially designed to iron out customers' manufacturing problems. DCL supply depots up and down the country ensure a speedy and dependable delivery service.

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**THE DISTILLERS COMPANY LIMITED · CHEMICAL DIVISION**

Bisol Sales Office, Devonshire House, Piccadilly, London, W.1

Telephone: MAYfair 8867

# TRADE NOTES

## P.V.C. Pipe

First product to be manufactured by the newly-formed Allied Structural Plastics Ltd. is medium impact rigid p.v.c. pressure pipe, which is being marketed under the trade name of Aspect. Made in sizes from 1 to 6 in. diameter, in three classes, it is suitable for working heads of 200, 300 and 400 ft., and with a wide range of fittings.

Applications include chemical processes and other industrial services, particularly where the purity of the product is important, as well as water mains, air conditioning installations, oil and natural gas piping, water filtration and sewage plant, and electrical conduit.

## Plastics Chemicals

Technical data sheets on the following chemicals have been issued by the Geigy Co. Ltd., Plastics Chemicals Division, Rhodes, Middleton, Manchester: Reomol DV35, a modifier of low-temperature properties of plasticised p.v.c. systems, where good flexibility combined with high resilience is required; RL Acid, a low-cost activator and lubricant for rubber compounds; and Product CGI, a copper greening inhibitor for p.v.c.

## Holden and Brooke

To meet increasing sales activity in London and Home Counties area, Holden and Brooke Ltd, manufacturers of a wide range of centrifugal pumps, reciprocating pumps and heat exchange plant, of Manchester, have moved their London office from Victoria Street, S.W.1, to larger premises at Elystan Mansions, 105/109 Fulham Road, London S.W.3 (Knightsbridge 6766/9). The new offices will eventually house a permanent display of Holden and Brooke products, Mr. H. J. Moore, sales director, will continue in charge.

## Change of Address

London offices of Rhodes, Brydon and Youatt Ltd., engineers, have been moved from 76 Victoria Street, S.W.1, to 45/51 Leman Street, London E.1 (telephone: Royal 1212).

## Flooring Composition

Claimed to have possibilities for wide application in industrial flooring where hard wear, corrosive conditions or combinations of both occur, Prodorite-Epiflor is essentially a monolithic flooring material applied by trowelling or spreading and based on epoxy resins, inert fillers and aggregates. Further details are available from the manufacturers, Prodorite Ltd., Eagle Works, Wednesbury, Staffs.

## P.C.C. in P.V.C. Compounds

A 12-page technical bulletin concerning the use of precipitated and activated calcium carbonates as fillers for p.v.c. compounds has been published by John and E. Sturge Ltd., Wheelleys Road, Birmingham 15. A table shows the grades of p.c.c. available, and lists their respective properties together with their main uses. Other tables show the effects

of various grades of p.c.c. on a number of p.v.c. compounds, based on tests carried out to appropriate British Standard specifications.

Two pages are devoted to outlining the application of p.c.c. in p.v.c. compounds for injection and compression moulding, extrusion, supported and unsupported calendared sheet and for high quality p.v.c. wall and floor tiles. Its use in p.v.c. pastes is also dealt with.

## Change of Name

Thomas Specialities Ltd., oil and chemical manufacturers, 17 Dundee Road, Trading Estate, Slough, Bucks, have changed their name to Plycol Ltd.

## New B.D.H. Chemicals

New entries to the catalogue of the B.D.H. Laboratories Chemical Laboratory Chemicals Division, British Drug Houses Ltd., Poole, are aldehyde-free acetic acid, chloro-methyl cyanide, *p*-fluoro-nitro-benzene *p*-phenol glycollonitrile 70% w/w in water, 1-naphthyl disodium ortho-phosphate, and hyaluronic acid potassium salt.

## Disperse Dye

A new homogeneous disperse dye, Dispersol Fast Yellow T, has been introduced by I.C.I. Dyestuffs Division. Designed initially for use on Terylene and other polyester fibres, it is of interest also for dyeing and printing secondary acetate and triacetate rayons. On all three fibres it is claimed to produce bright greenish yellow shades of excellent all-round fastness. It is stated that the high light fastness is maintained even in pale shades and also in mixture shades with other dyes. Greens of outstanding light fastness are produced using the new dye in admixture with Duranol Blue TR.

Circulars SC 833 and SC 862 (on polyester fibres and acetate fibres respectively) give full technical data and illus-

trative patterns on the use of the new dye. The circulars are available from I.C.I. at Imperial Chemical House, Millbank, London S.W.1.

## Surface Active Agent

Crill S8 is polyoxyethylene sorbitan monostearate, a water-soluble, versatile surface active agent and a member of the Crill 'S' series of polyoxyethylene derivatives of Sorbitan partial esters. A technical data sheet has been issued by the manufacturers, Croda Ltd., Cowick Hall, Snaith, Goole, Yorks.

## P.V.A. Emulsions

Newly published by Revertex Ltd., 51-55 Strand, London W.C.2, is a booklet on Emultex polyvinyl acetate emulsions. Technical bulletins are also available on Emultex Beta AC 23, vinyl acetate/acrylic copolymer emulsions, grades of Alcotex, and Emultex Beta 853, a vinyl acetate/maleic copolymer emulsion.

## Flamingo Foam

'Flamingo foam' is the title of a new publication of Flamingo Foam Ltd., 14 Victoria Street, London S.W.1. This closed air-cell insulating material consists of 98% still air and 2% polystyrene and is issued in boards from  $\frac{1}{4}$  in. thick to 18-in. thick.

## Isopad Application Engineers

Isopad Ltd. have appointed application engineers as follows: Scotland and North England, McCulloch and Miller, 180 West Regent Street, Glasgow. C.2; Ireland, Luke, Martyn and Co. Ltd., 17 Adelaide Street, Belfast; Yorkshire, P. A. Armstrong, 17 Hanover Street, Leeds 3; Lancs and Ches, C. E. Olson, 48 Manley Road, Manchester 16; Midlands, East Anglia and S. Wales, J. H. Habgood, Isopad, Boreham Wood, Herts; London, J. W. Young, Isopad, Boreham Wood. Mr. P. Cornish will demonstrate heating systems for laboratory and glass plant.

## Market Reports

### INDUSTRIAL CHEMICALS IN SUSTAINED DEMAND

**LONDON** The call for industrial chemicals has been well sustained with the movement against contracts at a satisfactory level. Activity on export account has been fairly good, and a steady flow of new inquiry has been reported. Prices for the most part are well held and the undertone is firm.

There has been little of fresh importance to record in the market for fertilisers and conditions continue quiet. In the coal tar products market demand for cresylic acid and creosote oil has remained steady, and a good outlet has been reported for most other items with the possible exception of pitch.

**MANCHESTER** Stoppages at textile mills and other industrial outlets for chemicals in consequence of annual holidays have affected the volume of business as well as the movement of supplies

against contracts, but in spite of this trading conditions are said to be reasonably satisfactory. There is a fairly steady movement of soda, potash and ammonia compounds, as well as a wide range of other chemicals, on both home and shipping accounts.

**SCOTLAND** The past week has again been one of reasonable activity and a good volume of trading can be reported from most sections of industry. Demands against contract requirements have been well maintained and there has been quite a volume of varied inquiries. Prices on the whole have remained fairly steady.

There has been little change in regard to agricultural chemicals, demands for which have been quieter although there has been some activity from certain areas.



# NEW PATENTS

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

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

## ACCEPTANCES

### Open to public inspection 2 August

Triazaindizoline compounds. Ilford Ltd. **874 704**  
Cobalamin-peptide complexes. Distillers Co. Ltd. **874 230**  
Modification of rubbery copolymers and compounds for use therein. Monsanto Chemical Co. **874 075**  
Basic derivatives of sacilylamide. Knoll AG. **874 206**  
Resinous dispersions. Montecatini Soc. Generale per l'Industria Mineraria E. Chimica. [Addition to 810 023.] **874 173**  
Fire resistant foams. Hooker Chemical Corp. **873 974**  
Di-quaternary ammonium compounds. Ciba Ltd. **874 032**  
Production of benzimidazolylidene compounds and the resulting products. Geigy AG, J. R. **874 209**  
Shaped structures of polyolefins. Farbwerke Hoechst AG. **874 174**  
Flame retardant polyester resinous compositions containing halogen and phosphorus. Hooker Chemical Corp. **874 210**  
Unsaturated polyester resin composition and process of polymerising same. American Cyanamid Co. **874 289**

Production of ureas. Monsanto Chemical Co. **874 325**  
Styrene polymer compositions. Monsanto Chemical Co. **874 240**  
Method of converting carbonaceous material to diamond. General Electric Co. **874 291**  
2-Methyl-2-n-propyl-N-mono-substituted-1,3-propanediol dicarbonates and method of manufacture. Carter Products Inc. **873 908**  
Layer-form structures of improved resistance to light containing amoplasts. Ciba Ltd. **874 179**  
Purification of dimethylterephthalate. Standard Oil Co. **873 913**  
Polyoxyalkylene compositions. Union Carbide Corp. **874 234**  
Unsaturated esters of polyoxyalkylene glycols. Union Carbide Corp. **874 235**  
Process for the production of  $\alpha$  (*p*-nitrobenzoyl)- $\alpha$ -bromoacetic acid esters. Egeyest Gyogy-szer es Tapszergyar. **874 361**  
Process for the production of (*p*-nitrobenzoyl)-( $\alpha$ -carboxy-benzoylamino) acetic acid esters. Egeyest Gyogy-szer es Tapszergyar. **874 363**  
Modified acrolein-pentaerythritol resins. Union Carbide Corp. **874 187**  
Bacteriostatic esters of substituted hydroxybenzoic acids. Monsanto Chemicals Ltd. **874 236**  
Preparation of hydrogenation products from halides of elements of groups III and IV of the periodic system. Union Carbide Corp. **874 237**  
Cyanine dyestuffs derived from 5-( $\alpha$ -thienyl)-benzoxazoles and silver halide emulsion layers optically sensitised therewith. Agfa AG. **874 011**  
Production of compounds of the betaionylidene-ethylidene series. Badische Anilin- & Soda-Fabrik AG. **873 872**  
Process for the preparation of 1-(*p*-nitro phenyl)-2-( $\alpha$ -carboxybenzoylamino)-1,3-propanediol. Egeyest Gyogy-szer es Tapszergyar. **874 364**  
Process for the production of coloured synthetic resins. Ciba Ltd. **874 369**  
Method of removing ethers from mixtures with hydrocarbons or hydrocarbon halides. Goldschmidt AG, Th. **873 873**

Methods and apparatus for the carbonisation of coal by the fluidisation technique with production of low temperature coal-tar. Charbonnages de France. **874 302**  
Resinous organosilicon compositions. Imperial Chemical Industries Ltd. **874 242**  
Preparation of steroids. Pfizer & Co., Inc., Chas. **874 188**  
Steroids and the manufacture thereof. Upjohn Co. **874 374, 874 213, 874 214, 874 375**  
Method of producing anthraquinones. American Cyanamid Co. **873 874**  
Preparation of citronellol and its aluminium intermediates. Glidden Co. **874 164**  
Preparation of boron nitride. Union Carbide Corp. **874 165, 874 166**  
Process for the stabilisation of sulphur trioxide or oleum. Farbenfabrik Wolfen Veb. **874 344**  
Propellant powders. Imperial Chemical Industries Ltd. [Addition to 861 810.] **874 259**  
Copolymers. Shawinigan Chemicals Ltd. **874 130**  
Process for hardening furfuryl alcohol resins. Spies, Hecker & Co. **874 131**  
Method of producing a formaldehyde-containing solution for the production of formaldehyde polymers. Sumitomo Chemical Co. Ltd. **874 097**  
Process for producing water-insoluble azo-dye-stuffs on shaped structures of aromatic polyesters, especially of polyethylene glycol terephthalates. Farbwerke Hoechst AG. **874 025**  
Production of conjugated diolefins. British Hydrocarbon Chemicals Ltd. **873 875**  
Piperazine derivative. Soc. des Usines Chimiques Rhone-Poulenc. **874 096**  
Production of acrylic acid esters. Union Carbide Corp. **873 993**  
Process for recovering sulphur for active carbon on which it has been deposited during the purification of the waste air from plants for manufacturing synthetic fibres by the viscose spinning process. Spinnfaser AG. **873 994**  
Sulphuric acid esters of dextran. Commonwealth Engineering Co. of Ohio. **873 995**  
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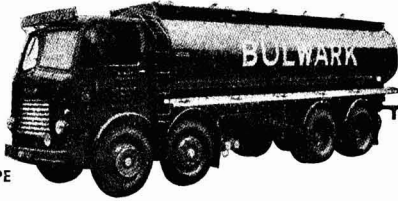
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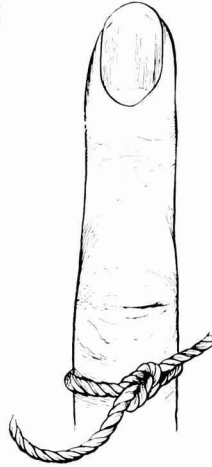
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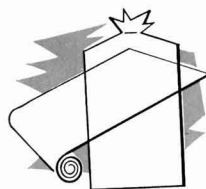
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