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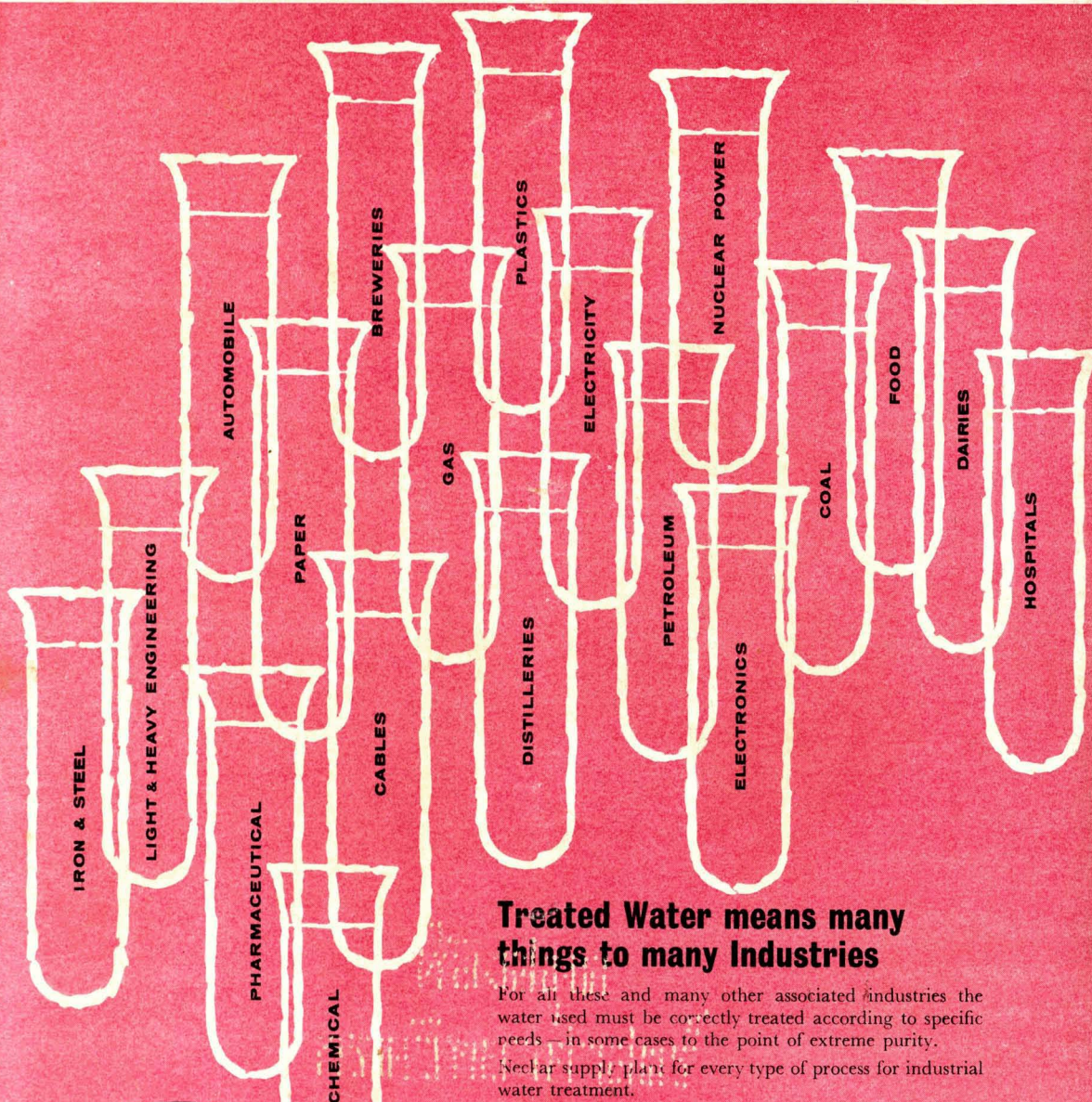
STATEMENT ON TRINIDAD  
AMMONIA (P. 724)

U.K. CHEMICAL  
EXPORTS (P. 732)

MAN-MADE FIBRES  
CONGRESS (P. 728)

5 May 1962. Vol. 87. No. 2234

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY



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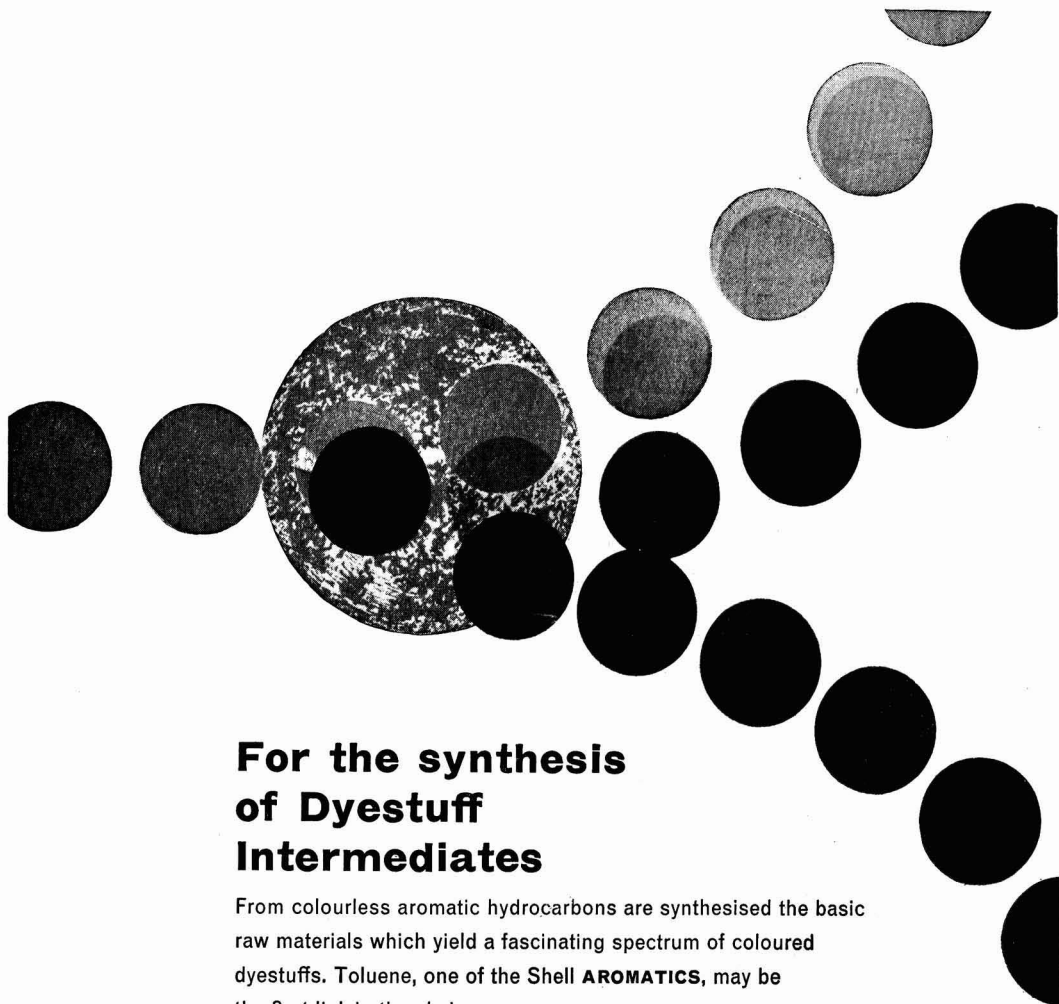
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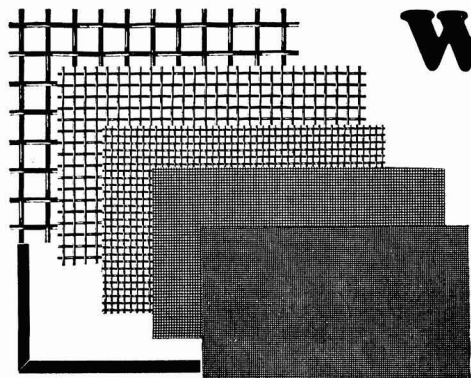
*Regional Offices at London, Birmingham, Manchester, Glasgow, Belfast and Dublin.*

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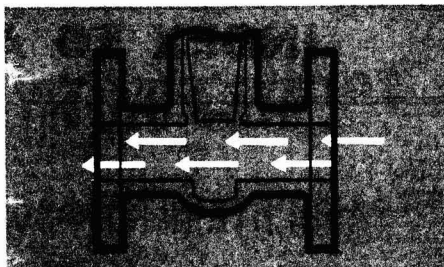
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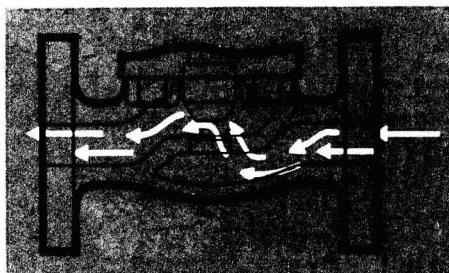
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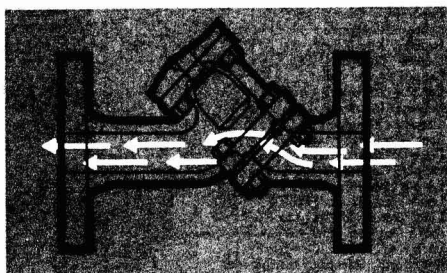
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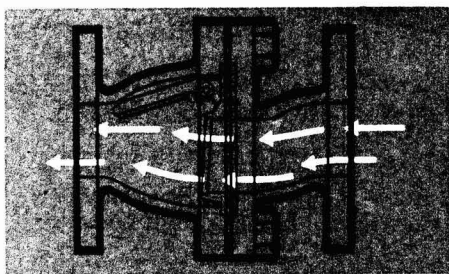
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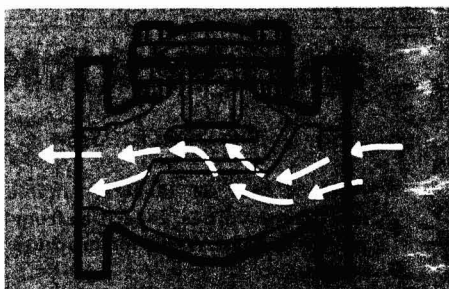
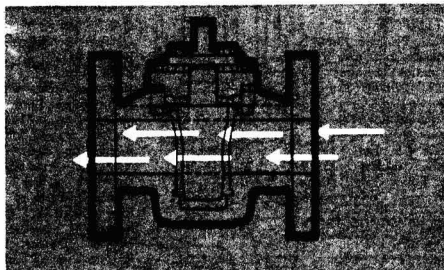
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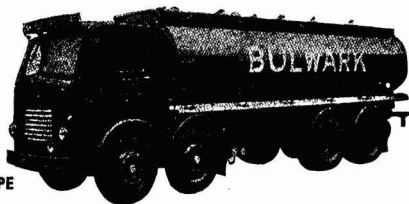
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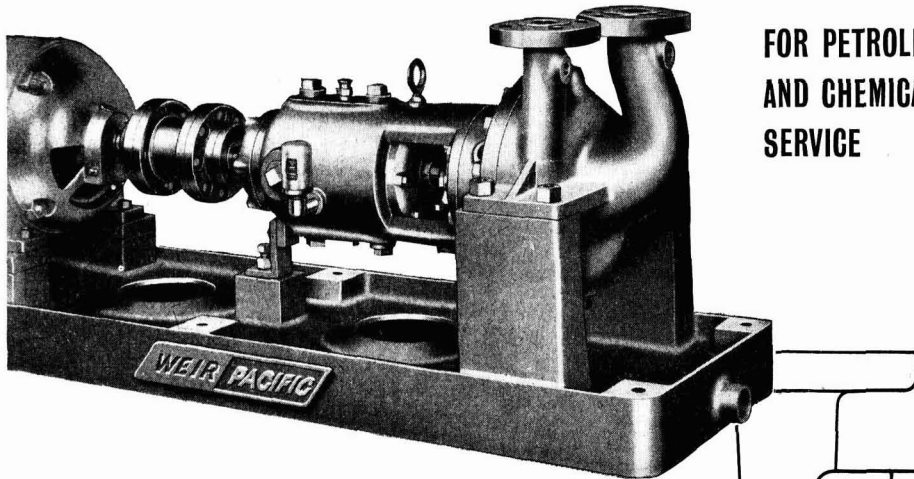
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**FOR PETROLEUM  
AND CHEMICAL  
SERVICE**

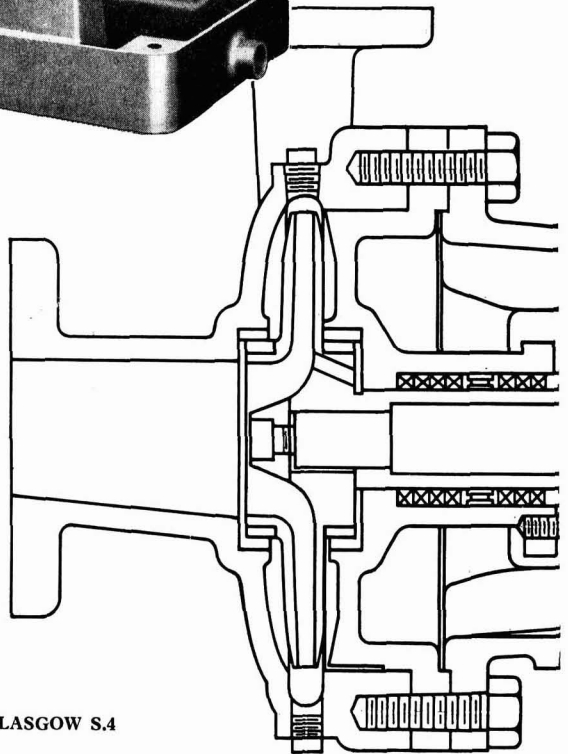


Type	SVC	SVA
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Output/min.:	15—3000 U.S. galls.	15—1600 U.S. galls.
Working Pressure:	600 p.s.i.g.	600 p.s.i.g.
Differential Head:	700 ft.	700 ft.

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Type DL:  
Single stage.  
Volute type.  
Axially split case.  
Double inlet impellers.



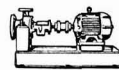
Type SPM:  
Single stage.  
Vertical pipe mounted.



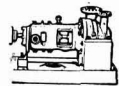
Type KHC:  
Single stage.  
Volute type.  
Axially split case.  
Double inlet impellers.



Type RHC:  
Two-stage. Volute type.  
Single or double inlet impellers.  
Axially split case.



Type SVE:  
Single stage.  
Volute type.  
Radially split case.  
Single inlet impellers.



Type RVC:  
Two-stage.  
Volute type.  
Single inlet impellers.  
Radially split case.



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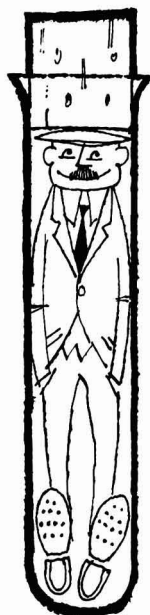
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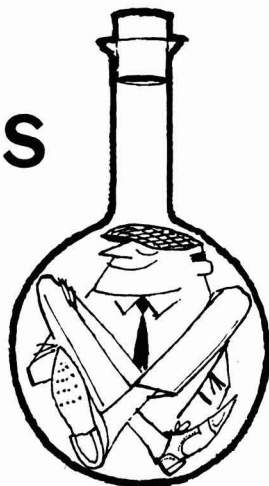
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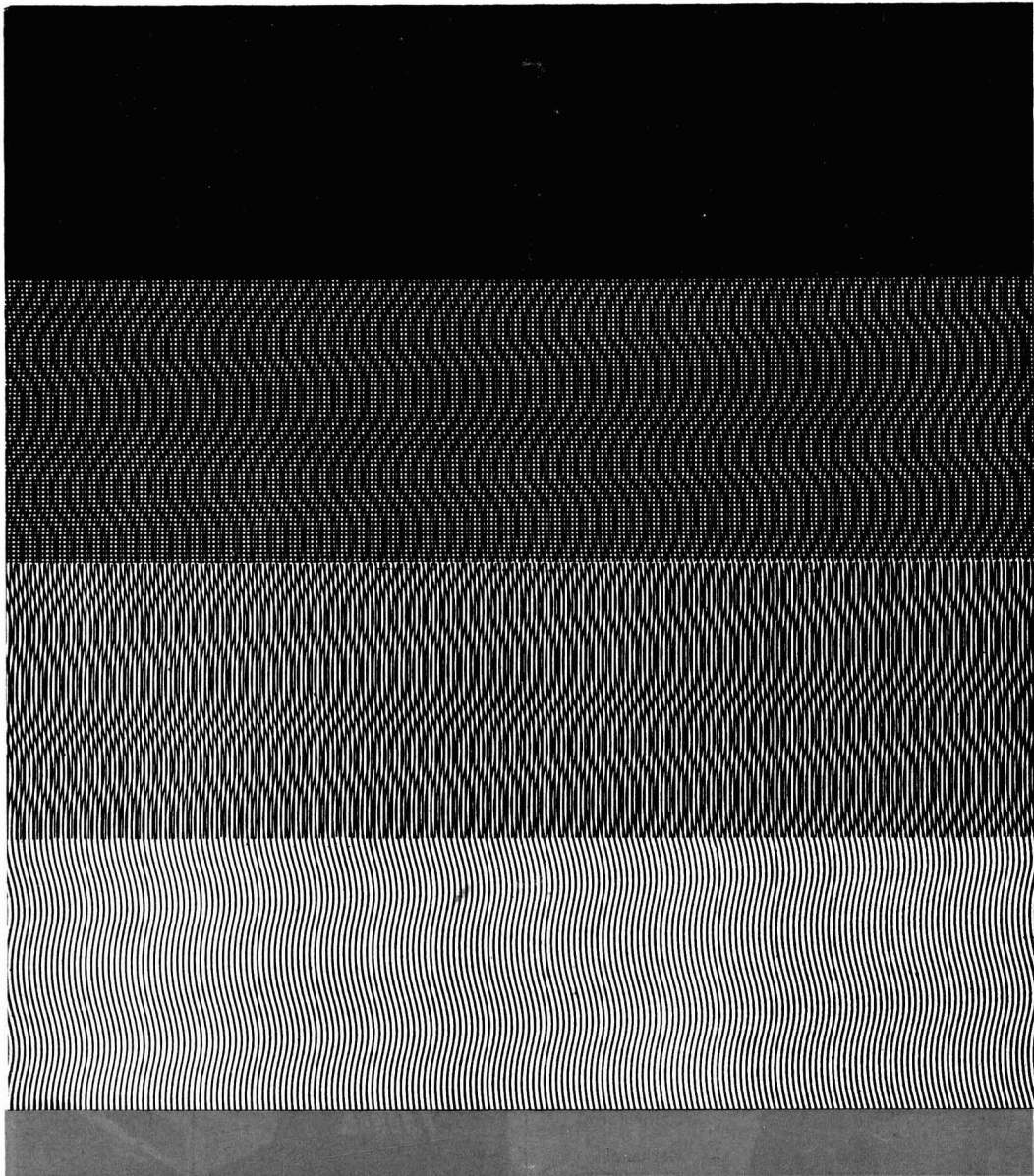
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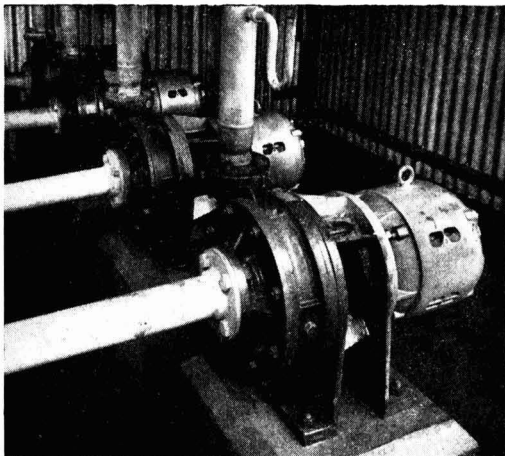
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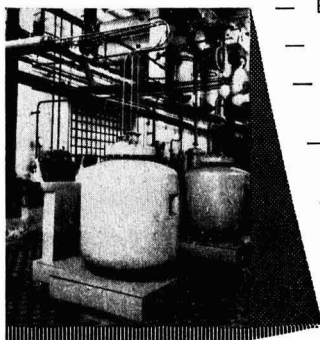
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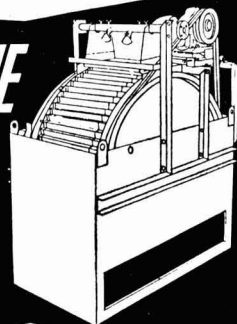
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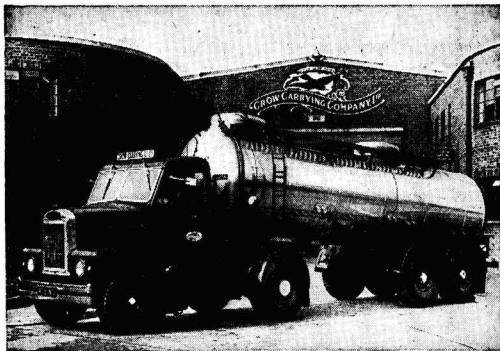
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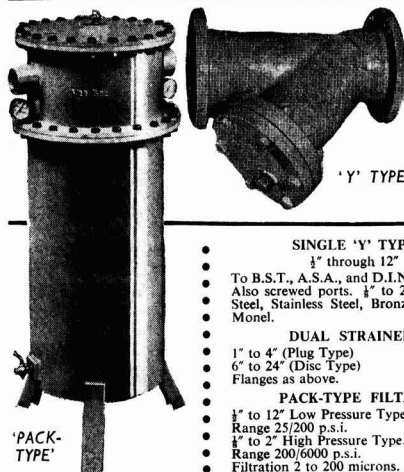
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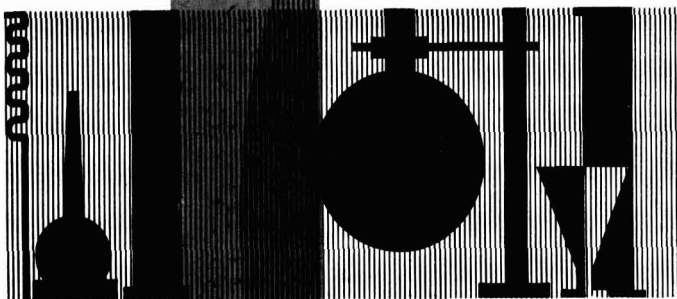
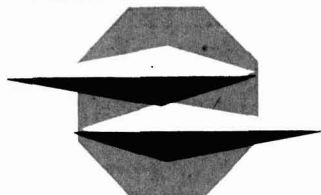
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VOL. 87

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# Chemical Age

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## EXPORT PROBLEMS

THE latest cut in the Bank Rate, from 5% to 4½%, and 2½% below the crisis level of last summer, could provide that much needed stimulus to Britain's export trade. It could also help encourage the chemical industry to go ahead with some of those construction projects that have been 'mothballed' in recent months.

Certainly, so far as the chemical export trade is concerned, the new Bank Rate level—the lowest for more than two years—could not have come at a more welcome time. As our special summary of Britain's trade in chemicals shows (see p. 732), exports in the first three months of this year were valued at £83.97 million, a fall of £1.1 million or 1.3%, compared with the same period of last year. Over the same period, chemical imports fell by £3.6 million, or 8.4%, to £43.27 million.

Over the first quarter of 1962, Britain's chemical exports to the European Free Trade Association countries increased slightly, while there was a bigger rise in shipments to the Common Market. Exports to East Europe and Mainland China were down slightly and the fall in shipments of chemicals to Commonwealth countries continued. There was little change in exports to the U.S.

Imports from all those areas were down as the following summary shows:

	In £1,000—January to March			
	Exports		Imports	
	1961	1962	1961	1962
E.F.T.A.	10,227	10,568	4,915	4,428
E.E.C.	13,841	14,201	19,547	18,610
Soviet-bloc	2,947	2,287	1,794	1,778
Commonwealth	30,819	29,317	4,601	3,584
U.S.	3,048	3,038	12,611	11,080
Total (all countries)	85,092	83,975	46,932	43,274

The chemical industry's policy of giving high priority to trade with the Common Market is obviously correct and the results show that despite a mounting tariff wall, it is possible to increase our exports to the 'Six'. Trade to E.F.T.A. countries is likely to increase steadily, if not spectacularly, and the Commonwealth, because of increasing industrialisation, is likely to continue as the most important single market for British chemicals for many years.

Trade with Soviet-bloc countries is not likely to show any big increase despite the potentialities because political questions, such as pressure from the U.S.S.R. to import crude oil, continue to over-ride purely commercial considerations. With this area, British chemical companies will doubtless continue to exploit the possibilities of trade in complete chemical plants.

As the Duke of Edinburgh's recent tour has shown, there is room for improvement in trade with Latin America, although any increase is entirely dependent on the effort put into the market by individual companies.

Our trade with the U.S. is the most unbalanced and must remain largely unpredictable. The U.S. currently accounts for 26% of our chemical import trade, but takes only 3.5% of our total chemical exports. It is to be hoped that the present moves towards trade liberalisation in Washington will help

(Continued on page 724)

## Letters to the Editor

# B.H.C. will not import Trinidad ammonia, says director

SIR.—My attention has been drawn to the article on the importation of ammonia from Trinidad on p. 680 of your journal, 28 April 1962.

I am writing to state that there is absolutely no truth in this statement that British Hydrocarbon Chemicals Ltd. are proposing to import ammonia.

Yours etc.,

C. E. EVANS,  
Managing Director,

British Hydrocarbon Chemicals Ltd.,  
London.

[In the report referred to, Mr. W. d'Leny, chairman of the I.C.I. Billingham Division, had stated that the division had been informed by C. Tennant and Co. Ltd. that that company in conjunction with B.H.C. planned to import 30,000 tons of ammonia a year from Trinidad.—Ed.]

## Idiocies of the duty on oils

SIR.—In your editorial on the recent budget you very properly drew attention to the continuance of the £2 a ton tax on heavy hydrocarbon oils.

Quite apart from the fact that this tax is hampering British industry, it is typical of the lack of scientific thought

behind the introduction of fiscal legislation. The tax was ostensibly introduced as a tax on fuel oils, but by definition it applies to materials not sold for burning purposes—such as timber preservatives and flotation oils. As a result, certain firms in the chemical industry manufacturing products of this kind based on oils are placed at a disadvantage compared with companies producing competitive products of different type and origin.

Your journal would do well to highlight idiocies of this nature on all possible occasions, as only by constant reiteration of the follies of this 'old Etonian' Government can we hope for some sensible thinking on future technological matters.

Yours etc.,

PATRICK MOXEY

83a Elizabeth Street,  
London S.W.1.

[One of largest British industrial concerns has already been priced out of world markets. Associated Portland Cement claim that the duty added as much as £1 million a year to their production costs. Total U.K. cement exports have declined from an end-1960 figure of 100,000 tons to an end-1961 figure of some 24,000 tons.—Ed.]

## I.C.I. invite tenders for Macclesfield drug plant

TENDERS have now been invited by the Pharmaceutical Division of I.C.I. for the civil engineering and building works for the first stage of their project to erect at Macclesfield a factory for the production, packaging and distribution of pharmaceuticals.

This first stage is estimated to cost about £5.5 million; it was first announced in January last year (CHEMICAL AGE, 4 February 1961, p. 207). It will involve the transfer to Macclesfield of the division's pharmaceutical processing and packaging activities and the establishment of a nucleus of a plant to make bulk pharmaceuticals.

Site facilities will include a pilot plant for the development of new discoveries.

Construction will start this summer and the first units are expected to be in operation by the autumn of 1964. These developments will occupy less than one-quarter of the total site, leaving scope for the expansion that will be necessary to provide for the manufacture of new discoveries emerging from the division's laboratories at nearby Alderley Park, where more than £1 million/year is spent on research.

The division has a number of promising products at the clinical trials stage for which manufacturing capacity will be needed at Macclesfield in addition to that now to be provided.

## Geigy announce further plasticiser price cuts

FURTHER price reductions for their phthalate range of plasticisers were announced recently by Geigy Ltd. They are as follows (per ton in each case): Reomol DMP £8, Reomol DEP £7, Reomol DBP and DIBP £6, Reomol D79P, DIOP, DCP, DOP, DIDP and DNP by £4 and Reomol BBP by £5. Two specialities, Reomol P and Reomol 4PG, have each been reduced by £5 per ton.

The new prices are effective on all orders executed on and after 24 April.

## Export problems

(Continued from page 723)

remove this great disparity. As long as American producers continue to regard Europe as a dumping ground to help solve their vast over-capacity problems, their militant defence of a high tariff wall is patently immoral.

It is extremely unlikely that parity in U.S.-European tariff structures would lead to the emasculation of the U.S. chemical industry that American companies fear so much. It would, greatly strengthen commercial and economic links between two great areas of the Western World.

## Manufacturers' survey of U.K. chemical industry

WHILE output of the chemical industry in the U.K. over the three months ended 31 March had been largely constant, exports had tended to fall. This finding is contained in the first issue of a quarterly survey of production trends collated by the National Association of British Manufacturers.

The survey, conducted among over 500 member firms in industry, including chemicals, oils and paints, said that although some firms in all sections of industry had reduced their labour force this seemed to be a general trend only in the chemicals and building materials trades.

In a forecast for the next three months, the survey said very nearly 50% of the firms covered expected an increased level of production but this was less true of building materials, chemicals and paper.

## Laporte executive's views on Common Market

SHOULD Britain eventually enter the Common Market, the long-term performance of the chemical industry would probably be determined by the degree to which it specialises in the production of chemicals in which this country has advantages, states Mr. W. R. Everard, group commercial intelligence officer, in an interview in the latest issue of *Laporte News*, the magazine of the Laporte Industries group.

Such advantages, in Mr. Everard's opinion, could be accumulated knowledge about certain chemicals or access to low-cost raw materials. In this connection, Britain's lack of domestic sources of oil or natural gas could ultimately prove a serious disadvantage.

Of the more immediate effects of tariff changes, should Britain join, Mr. Everard considers that the most efficient firms are unlikely to be seriously disturbed by any tariff cuts. The least efficient, however, will certainly feel a draught. At the same time, because the production of organic chemicals in this country has traditionally been protected by a high level of tariffs, that part of the industry is likely to feel the tariff changes most keenly.

## I.C.I. refute Wall Paper merger rumours

"ANY suggestions of a merger between I.C.I. and Wall Paper Manufacturers are entirely without foundation." A statement to this effect has been made by Morgan Grenfell and Co., advisers to I.C.I., following rumours in the Press.

These rumours persisted despite an earlier denial by Wall Paper Manufacturers.

## Du Pont phone number

Telephone number of Du Pont Co. (U.K.) Ltd., 76 Jermyn Street, London S.W.1, is now Trafalgar 7090.



## Project News

# Chemico to build Trinidad ammonia plant for Grace

CONTRACT for erection of the 165,000 ton a year ammonia plant of **W. R. Grace** in Trinidad has been awarded to **Chemico**. However, work will not begin until the U.S. Government approves the overseas investment on the project. The new plant is scheduled for completion in 1964. The output is probably destined for Southern U.S. and Europe.

Grace have a 49% interest in **Federation Chemicals Ltd.**, who already operate an ammonia plant in Trinidad. Output of the 35,000 ton a year plant goes mostly to local consumers and to Latin America.

## Esso LPG contract granted to Matthew Hall

● A CONTRACT for the provision of a liquefied petroleum gas facility at **Esso's** Fawley refinery has been awarded to **Matthew Hall and Co. Ltd.** The gas will be collected from the major refinery units purified and piped to a central refrigeration plant and storage tank.

As stated in **CHEMICAL AGE**, 28 October, 1961, p. 667, the gas will be piped to the North Thames Gas Board's Southall Station.

Matthew Hall will carry out the engineering design, procurement and construction of all new gas processing equipment at the units, together with the piping network, and will handle modifications to the fuel oil system which forms part of the overall facilities required.

## Monsanto's new fumaric acid plant commissioned

● THE fumaric acid plant of **Monsanto Chemical Ltd.**, on which work was begun early last year (see **CHEMICAL AGE**, 11 March 1961, p. 399) has now been commissioned at the company's Newport factory.

Capacity of the plant is not officially announced but is believed to be of the order of 5 million lb. a year. The construction of the plant was part of the £2,540,000 programme, which also included a polythene expansion and a phenacetin plant.

## B.P. plan another distillation plant for Kent refinery

● INVESTIGATION work has been started on a third vacuum distillation unit at the Isle of Grain refinery of **British Petroleum**. The unit is designed to process nearly 800,000 gall. a day (25,000 barrels). Three products will be produced—distillate as feedstock for the catalytic cracker, diesel fuel and residue for fuel oil. The two existing crackers, each with a nominal capacity of 25,000 barrels a day, produce mainly feedstocks for the lube oil plant.

The new unit, which will be capable

of operating under high or low vacuum conditions, will help balance the refinery's production of motor spirit and fuel oil. Completion is scheduled for about September 1963; main contractors are **Matthew Hall and Co. Ltd.**

Altogether five units are nearing completion on the No. 3 catalytic reformer and the aromatics plant projects at the refinery. With the completion of the new distillation unit, BP will have invested more than £90 million in the Kent refinery.

The No. 3 catalytic reformer has been handled by **George Wimpey and Co. Ltd.**, who have also been one of the three main contractors for the aromatics plant.

## New pharmaceutical factory in Dublin

● A NEW plant has been opened in Dublin by **Leo Pharmaceutical Products** of Copenhagen. Most of the output will be for the highly competitive export market, and as a new industry in Ireland it will automatically qualify for complete remission of taxes on sales abroad.

A research laboratory is being set up by the firm in Dublin.

## British gas mains for Soviet sulphate plant

● COMPLETION of 180 ft. of 54 in. dia. mild steel gas mains lined with stainless steel to the order of **Simon-Carves Ltd.** for **Techmashimport**, Moscow, is announced by **Darchem Engineering Ltd.**

Stillington, Stockton-on-Tees, a member of the **Darlington Chemicals Ltd.** group.

The mains are in 18 sections, constructed from  $\frac{1}{2}$  in. mild steel, and lined with ASAI 317 stainless steel 0.032 in. thick, having high resistance to corrosion under plant conditions. The principal advantage of lining vessels with stainless steel is stated to be achieving the effect of solid stainless steel structures without involving very high costs. The mains were transported by rail to Manchester last week for eventual shipment to the U.S.S.R. for a sulphate plant.

## Sanders and Forster's contract for Esso butyl plant

● THE London structural company, **Sanders and Forster Ltd.**, are to supply **Foster Wheeler Ltd.**, the main contractors, with a clear portal type standard steel building to house the new finishing and packaging unit at **Esso's** butyl rubber project at Fawley (see **C.A.**, 28 April, p. 681). The 180 ft. building has roofs and sides clad with asbestos sheet.

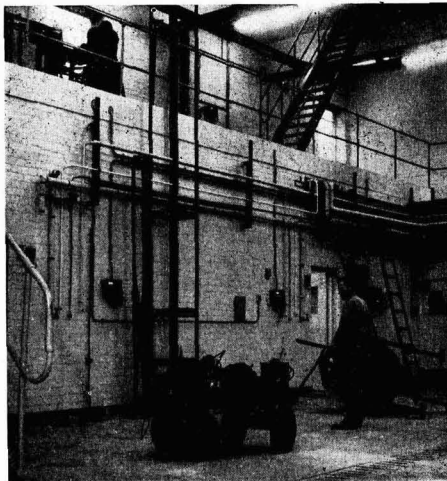
## Howard's sorbitol plant due on stream in Canada

● THE first complete manufacture in Canada of sorbitol has been announced by **Howards and Sons (Canada) Ltd.**, a member of the **Laporte Industries Group**.

Production is scheduled to start this month in Cornwall, Ont. The process to be used was developed by **Howards of Ilford Ltd.**, also a member of the **Laporte Group**. It consists of the enzymation of starch and hydrogenation of glucose.

The capacity of the new plant will be well in excess of the present Canadian market, and is more than sufficient to satisfy such future end uses as the developing application in a chemical intermediate for polyurethane foams.

## Laporte Acids' new experimental lab.



Part of the new experimental plant laboratory at the £80,000 research centre opened recently by **Laporte Acids Ltd.** at Castleford, Yorks (see **'Chemical Age'**, 7 April, p. 556)



★ IMPORTANCE of the role of man-made fibres in industry was brought home to us by Col. F. T. Davies, president, Second World Congress of Man-Made Fibres, at a Press conference preceding the activities in the Royal Albert Hall, London.

Today, he mentioned, nine out of 10 motor vehicles on the road had rayon tyrecord as basic tyre fibre, and about 24% of British cigarettes had filter tips two-thirds of which came from man-made fibres. When the first rocket reached the moon, man-made fibres would supply some of its components. The oil, chemical and pulp industries all benefited from the continuous expansion of man-made fibre sales, as suppliers of raw materials. It was fitting therefore the theme of the congress was 'The impact of man-made fibres'.

★ INDUSTRY is naturally ever on the look-out for time-saving and cost-reducing devices. Among the latest interesting developments in this field is the Bowater all-fibre drum. By using these instead of timber crates for packing automatic water stills, Manesty Machines Ltd., of Speke, Liverpool, state they have halved packing time and cut freightage costs by 25%.

Mr. K. A. Mitchell, Manesty's sales manager, explaining his firm's decision to use non-returnable drums instead of wooden crates for the home market, tells me they were prompted to consider a new pack by wholesalers who complained the returnable timber crates presented problems of accounting and storage. "After experimenting with several alternative packs we concluded the Bowater all-fibre drum gave the best all-round solution," he said. Handling was considerably easier—the timber crate weighed as much as the product—and protection was quite sufficient, he added. And, most important, customers (in this case wholesalers) were delighted, he reported.

★ COMPANY history of U.S. Industries, Inc., whose president and chairman, Mr. J. I. Snyder, Jr., is visiting the U.K. in connection with an automation and employment trust project makes interesting reading.

Founded in Pennsylvania in 1897, as the Pressed Steel Car Company, it introduced the all-steel hopper box and passenger cars on the railroads. Today it has 15 divisions and subsidiaries in the U.S. and abroad, manufacturing products for use, among other fields, in industrial automation, transmission of

oil, water and gas, petroleum production and electronics.

Its U.K. company, U.S. Industries, Inc. (Great Britain) Ltd. was set up in 1959 and has overall responsibility for worldwide sales (excluding Canada and the U.S.) of oilfield equipment manufactured by U.S.I. in the U.S. and Burtonwood Engineering Co. Ltd., the U.K. Burtonwood's newly-formed automation division will manufacture the Auto-Tutor Mark III teaching machine and manufacture and market the Transfe-Robot 200, an automatic machine for assembly and related tasks.

Briefly, the British company plans a trust to study and develop ways to re-train workers in automation techniques and to counter personal and social problems created by its inevitable growth here. A levy raised on every automation machine produced by the British group will go to a trust administered by a non-profit making company with a board of directors taken from management and, it is hoped, from trades unions.

It will be totally British and its funds will be devoted to helping British workers. Mr. Snyder said at his Press conference in London last week. The pattern will follow that of the recently-established U.S. foundation.

★ INTERESTING light on university salaries was thrown last week by Dr. John Read of the Chemistry Department at St. Andrews. Writing in *The Times* he gave the following summary, recently prepared by lecturers of the Chemistry Department:

Occupation	Salary earned during six years after graduation £	Salary in seventh year £
Industry .. .. .	6,060	1,230
Patent Office .. .	6,250	1,400
Scientific Civil Service	6,000	1,460
School .. .. .	5,300	1,250
Technical College ..	6,120	1,720
University .. .. .	3,750	1,050

This is doubtless the reason why British science facilities have lost so many of their best men in recent years and why, more recently, three Glasgow University chemistry staff are emigrating to Canada.

★ THE world-wide popularity of the Fauser method of nitrogen production, which dates from the agreement between Guido Denegani and Giacomo Fauser in 1921 permitting Montecatini to exploit the method industrially, continues to grow. At this week's Production Exhibition at Olympia, Montecatini disclosed that there are now no fewer than 286 plants in 27 countries exploiting the

Fauser-Montecatini patents. This figure, which dates from 31 December 1961, represents an increase of nine over the number of plants operating at the end of 1960.

★ A NEW family of polymeric materials has been developed by Allied Chemical. No details have been released beyond that the polymers involve chlorine and petrochemical intermediates and that they are protected by patents. The company considers this development a major technological breakthrough.

Uses for the polymers will include the general area of films and plastics. Allied foresee potential uses of many millions of lbs. for some products of the family.

★ EUROPE'S first privately owned nuclear power plant to send out atomic power to the grid system—more than 40 million kWh since power operation began in June 1961—is that at Kahl, West Germany, built for Rheinisch-Westfälische Elektrizitätswerk AG (R.W.E.) and Bayernwerk AG by the German engineering firm A.E.G. as main contractor with the U.S. General Electric Co. and the civil engineering firm Hochtief as sub-contractors. The reactor is of the boiling water type and is essentially a pilot plant with an electricity output of 15,000 kWh.

Two films describing the construction and operation of the Kahl reactor were shown in London recently.

★ FIRST Zeiss spectrofluorimeter with two quartz monochromators to be imported into the U.K. has recently been delivered to May and Baker's Dagenham research laboratories. It will provide more information about the nature and concentration of substances which fluoresce in the ultra-violet and visible regions of the spectrum than can be obtained with a simple arrangement of filters. The spectrofluorimeter enables the wavelengths of both the exciting and fluorescent radiation to be changed continuously without rearrangement of the instrument parts. U.K. agents for Carl Zeiss are Degenhardt and Co. Ltd., 6 Cavendish Square, London W.1.

★ I LEARNED late on Wednesday, as CHEMICAL AGE went to press, that an announcement was thought to be imminent on the appointment of a new post for Mr. Avison Wormald, a former joint managing director of Fisons Ltd. It is believed that he will join a U.S. chemical company operating in Europe.

*Alembic*

## **A.B.P.I. annual report**

# COMMON MARKET ENTRY MIGHT CUT PHARMACEUTICAL EXPORTS

IT was by no means certain that the lowering and eventual elimination of tariff barriers that would result from Britain's entry into the Common Market would enable the British pharmaceutical industry to improve still further its trading position vis-à-vis the Six. The annual report of the Association of the British Pharmaceutical Industry stated this in commenting on the rise of pharmaceutical exports to the C.M. from £2.7 million in 1959 to £3.4 million in 1960 and £4.4 million in 1961. It added that more important than tariffs as barriers to trade with the Continent were the restrictions imposed by health control and registration systems that tended, in many cases, to favour local manufacture.

Those impediments to inter-European trade, the report said, had been under study for some time by the Organisation for Economic Co-operation and Development, by the organisations of pharmaceutical manufacturers in the Common Market (G.I.I.P.) and in the European Free Trade Association and by the industrial pharmacists' section of the International Pharmaceutical Federation. Those bodies had each recognised the need to harmonise and simplify the various requirements in force.

Strength and prosperity of the British pharmaceutical industry depend in large measure upon the continued sale in the home market of branded goods of quality whose names and those of their manufacturers enjoy a world-wide reputation. The Association of the British Pharmaceutical Industry emphasised this in its memorandum of 30 May 1961, to the Minister of Health, objecting to the recommendations of the Cohen Committee, records the annual report.

The whole of this issue was discussed by the Hinchliffe Committee on the cost of prescribing in their final report of 1959 when they recommended that firms should be encouraged to increase their research effort. The conditions which favour profits for research, such as patent rights, the publicising of proprietary names and the price agreement with the Ministry of Health should be accepted.

### **Cohen report criticised**

The memorandum pointed out that the Cohen report was likely to affect adversely the trade as its exports were predominantly branded products.

Whereas British pharmaceutical exports in 1961 increased by £4.4 million over the 1960 figure of £44.4 million, imports in both years stayed at £5.3 m., according to statistics of the pharmaceutical industry and the National Health Service.

Research and development expenditure

by the U.K. industry rose from £6.3 million in 1959 to £7.5 in 1960.

Britain's total National Health Service bill increased from £738.3 million in 1959-60 to £827.4 in 1960-61. The pharmaceutical share jumped from £84.5 million to £93.0 million.

The total cost of drugs to the service soared from £63.5 million in 1959-60 to £70.3 million.

## President seeks single C.M. patent system, attacks ill-informed drug industry critics

A SINGLE patent system throughout the Common Market that will secure for the inventor a proper measure of protection and a just and adequate reward for the effort and resources devoted to research while at the same time providing proper safeguards against "any possible inflexibly monopolistic exploitation of such advantages as may be conferred by statute law" is of first importance to the future of the pharmaceutical industry in Western Europe.

This statement was made by Mr. H. W. Palmer, outgoing president of the Association of the British Pharmaceutical Industry, when proposing the toast of 'Our Guests' at the association's annual dinner at The Dorchester, London, on 25 April.

Earlier, Mr. Palmer had said that since the coming into effect of the Stockholm Treaty of 1960, the association had spent considerable time in debating issues facing industrial pharmacy with Britain's colleagues in the Seven. On the assumption that the U.K. entered the Common Market some time this year or next, he said, it would be called upon to play an increasingly important part in the deliberations of an enlarged organisation and he believed it was well placed to put the case for a unified patent law. It was essential that such a move be carried through to a successful conclusion, even if—though he hoped this would not be the case—the Government's initiative to enter the European Economic Community failed in its full effect.

Turning to the question of public criticism of the pharmaceutical industry which he described as ill-informed and unreasonable, Mr. Palmer said that during the last few years the pharmaceutical companies had had to bear more than their fair share of such comment. The removal to the House of Lords of some of their more vocal critics seemed to have done little to improve the accuracy of their documentation, he added.

It had recently been suggested that manufacturers were so bent on getting

Unit costs of the British industry, if deprived of an important part of its home market, would tend to rise beyond a competitive level since the heavy overheads of pharmaceutical research and production would need to be spread over a smaller output. Furthermore, the use of section 46 might well attract similar but less restrained action in other territories where the effective loss of patent protection was likely to mean far more to British exports than any conceivable economy that could accrue to the National Health Service.

The report quotes the above salient points made in objections by the Association last year to the Government's proposal to use section 46 of the Patents Act, 1949, in obtaining certain drugs for the hospital service from manufacturers either in this country or abroad.

the maximum profit from the development and sale of drugs that they had rushed drugs on to the market without adequate consideration of the results of pharmacological and clinical trials. Nothing could be further from the truth.

"The standards of integrity and responsibility which British houses set themselves are, on the evidence of my own personal experience of trading in most overseas markets, among the highest existing anywhere in the world.

"There is not a member of this association who does not fully appreciate the very real responsibility which rests on him for the proper assessment of new drugs before sale and for the maintenance of constant vigilance for unforeseen and, indeed, unforeseeable side effects which may manifest themselves after prolonged and widespread use."

Mr. Graham Hutton, O.B.E., responded.

### **Black oil usage retarded by duty**

THE introduction of a duty on heavy oils in the 1961 Budget appears to have retarded the rate of growth in the usage of 'black oils' last year, when compared with previous years, according to figures published recently by the Petroleum Information Bureau. Total demand for petroleum products in 1961 was 7.8% higher than in 1960, amounting to 46,014,950 tons compared with 42,696,037. Deliveries of chemical feedstock, which have risen rapidly in the past, were almost unchanged as compared with 1960 at 1,578,167 tons.

The following table gives the estimated end-use analysis of deliveries of propane and butane into consumption.

	'000 tons	
	1960	1961
End use		
Domestic	55	56
Chemical feedstock	4	5
Gasmaking	51	72
Others	154	206

# IMPORTANT DEVELOPMENTS EXPECTED IN POLYOLEFIN, POLYOXYMETHYLENE FIBRES

THE World Congress on Man-made Fibres which took place in London this week is the second of its kind to be held; the first was in Paris in 1954. The theme of this year's Congress was the 'Impact of man-made fibres.' All aspects of the theme were discussed from the highly technical to the point of view of the retail market and consumer. All lectures given at the Congress were by people not directly connected with the basic producing industry.

Delegates, who attended by invitation only and who numbered more than 3,000, were from 40 textile manufacturing countries. The man-made fibres industry's international body, the Comité International de la Rayonne et des Fibres Synthétiques, was formed in 1950 and its membership is entirely made up of man-made fibre producing companies.

The Congress was divided into two parts, the Plenary session which was held in the Royal Albert Hall, where more general topics were discussed and the conference and scientific sessions which were carried on simultaneously at the Connaught Rooms. The Plenary session was opened by H.M. Queen Elizabeth, the Queen Mother, who is patron of the Congress, and the opening address was given by M. Jean Monney, a former president of the European Coal and Steel Community.

There have been three main waves of advance in the production of man-made fibres during the present century: first the large-scale production of continuous filament cellulosic and cellulose acetate rayons; the marketing of these materials as staple fibre for processing, alone or in admixture with other fibres, on conventional carding and spinning machines; and finally the production of truly synthetic fibres.

## Recent progress

Recent progress in each of these fields was discussed by J. B. Speakman, Department of Textile Industries, University of Leeds in his paper on 'Recent advances in the technology of man-made fibres.' The rise in world production of synthetic fibres has been spectacular. From an average output of 374 million lb. between 1951 to 1955 demand required a planned capacity of 2,392 million in 1961 and production is expected to reach 3,600 million in 1970. Over a similar period, production of rayon and acetate has risen from 2,097 million lb. continuous filament and 2,163 staple to a combined planned capacity of 7,835 million in 1961.

The rise in synthetic fibre production has been accompanied by an increase in the number of types available. As was

expected, in view of the high tenacity of several of the synthetic fibres, there is now severe competition with rayon in the field of industrial uses, and the rayon industry has responded sharply to the challenge by producing new types of high tenacity yarn.

At the present time the main truly synthetic fibres are the polyamides, polyesters and acrylics, but it is clear that important developments must be expected with the polyolefins and polyoxymethylene.

The synthesis of isotactic polypropylene by heterogeneous catalysis has an important, if remote bearing on the possibility of synthesising chain molecules closely related to those of silk. In the crystalline regions of silk, four amino acids are linked together in a particular order and configuration to give segments with a molecular weight of about 4,000. The mechanism of the synthesis, which is carried out by the larvae at body temperature, is not understood, but a first step towards the stereospecific synthesis of proteins seems to have been taken in the new methods of preparing polypropylene in which the asymmetric carbon atoms have the same special configuration. Since, in addition, the chain molecules of some synthetic polypeptides do have the spiral configuration which plays an important part in determining the elastic properties of wool, it seems likely that interest in synthetic proteins as fibre-forming polymers is likely to grow.

## Non-woven fabric

Another challenge which has emerged from the inventiveness of the man-made fibre industries concerns the production of non-woven or bonded-fibre fabric. Interest in such materials did increase with the advent of synthetic fibres of high tenacity, such as the polyamides and polyesters, but the resin-bonded carded blends of rayon and, say, polyamide staple fibre, lacked the draping power of ordinary textile fabrics. A means of restricting the bonding to the regions where the fibres cross one another has emerged with the invention of fibrils. These are synthetic fibrous particles, about 1 mm. long with irregular twig like projections, which hold the fibres until firmer bonds can be formed by heat fusion. Localised bonding of this type can be used to give products of greatly increased flexibility and draping power. Further developments of such products, which have been given the name of tetryls, will be awaited with great interest.

Not by any means have all problems been overcome in the production and fabrication of man-made fibres. There is for instance no method of imposing a

surface scale structure on man-made fibres, the consolidation which is needed as a basis for raised and other finishes which are characteristic of fabrics used for blankets and heavy coatings. Also, by comparison with the handle of finer animal fibres, that of man-made fibres, even in the form of bulked yarns, is usually inferior. The causes of differences, which do not depend solely on fibre-fineness, deserve investigation to provide a sound basis for the development of new fibres as well as new finishes.

The use of fibres for the reinforcement of synthetic resins was discussed in a paper by H. L. Riley, United Coke and Chemical Co., Sheffield. Reinforced plastics are now standard materials of construction and engineering. Most of the spectacular advances in the fields of transport, building construction and general engineering have been achieved by the use of fibreglass reinforced resins. However, where somewhat lower specific strength can be tolerated, other fibres could be used with substantial saving of costs. Development work has already been carried out on the use of sisal and jute fibres.

The use of mixed fibre fabrics to improve dimensional stability, adsorption properties and fire-resistance requires further investigation. The wider realisation in the saving of dead weight which could be achieved by the use of these materials will no doubt lead to their wider use in the transport and mining industries.

The present rate of growth in the fibre-reinforced resin industry and the growing appreciation by engineers and architects of the possibilities inherent in these new materials leave little doubt concerning the future expansion of the industry. Important contributions to this expansion can be made by the textile industry by the production of fibres and fabrics even more suitable for resin reinforcement than those at present available.

## Chemicals exempted from import duty

SEVERAL chemicals which have been liable to import duty became temporarily exempt from 1 May, 1962, under the Treasury Import Duties (Temporary Exemptions) (No. 2) Order 1962.

Among the products listed are yarn wholly of polyurethane capable of being stretched to at least five times its original length (until 1 July, 1962), polyurethane monofilament capable of being stretched to five times its original length (until 1 September, 1962), and certain mixed isomers of 1:2:3:4:5:6-hexachlorocyclohexane (until 1 July, 1962).



# I.Chem.E. Exploratory Committee urges appointment of industrial research fellows from universities

**A**PPOINTMENT of industrial research fellows from the ranks of the younger members of the staffs of universities and colleges of technology to help formulate and implement explicit research programmes in fields of chemical engineering in which fundamental research is thought to be needed is suggested in the first report of the Exploratory Committee of the Institution of Chemical Engineers.

The report, published in the April edition of *The Chemical Engineer*, goes on to say that the association of staff from universities and colleges with such investigations would have the desirable effect of bringing younger staff members into closer touch with the realities of industry and might even create authorities in a number of fields.

It adds that even when research is proceeding on a particular topic in a university it may be that those supervising it are not fully aware of the industrial background. Even very fundamental work is likely to be healthier and ultimately more productive if its industrial potential is clearly visualised. "Less fundamental work can become academic in the worst sense, by seeking to solve non-existent industrial problems or problems which have ceased to be significant. For these reasons, regular contact should be fostered between those engaged on university research in chemical engineering and those familiar with the industrial problems which should inspire the research. Representatives of industry would no doubt be glad of opportunities to find out what is being done in universities and to air their own problems. Apart from this, universities might benefit from regular meetings with colleagues working in similar fields."

## Working parties

To this end, the committee members recommend that working parties be set up as a means of bringing together those in industry, in universities and appropriate research organisations working on, or interested in, specific topics.

The committee was set up in January 1961, under the chairmanship of Professor P. V. Danckwerts, to consider the possible role of the institution in encouraging, promoting or guiding research in chemical engineering and allied fields. It concludes that this can be done in four ways:

1. By helping industry to formulate and implement research in programmes in fields where more fundamental research is needed.
2. By helping the universities and colleges to maintain lively and realistic research programmes.
3. By suggesting speculative and exploratory fields of research detached from

the current preoccupations of industry; and

4. By making recommendations in the appropriate quarters as to the role in which Government research institutes might play in chemical engineering research.

The members of the committee think it specially important that the development of concepts and theories be given due weight in any proposals for research. The report says that some of the most notable advances have depended on original concepts.

There is also a place in research for the 'functional analysis' of operating plant, says the report, and wherever appropriate and possible the results of theory and experiment should be compared with the realities of practice.

The report also draws attention to the widespread opinion in industry that fundamental research is still required in a number of bread-and-butter fields. It quotes the example of the joint A.B.C.M./B.C.P.M.A. research committee which, as a result of a referendum among

member firms of the two bodies, has discovered 14 fields in which research is felt to be needed.

Committee members are currently considering how best the industry's practical problems can be grouped into separate fields which could each be made the province of a single industrial research fellow. Each fellow would be required to establish the nature of the real industrial problems, what additions to knowledge might mitigate these and what programme of fundamental research might produce the required knowledge.

In the eyes of the committee members this last question is the most crucial and the most difficult to answer with precision. The more specifically it is answered, the more valuable the fellow's report will be, they say, and they instance the report of the A.B.C.M./B.C.P.M.A. Distillation Panel as an "excellent" guide to the degree of detail which might reasonably be expected.

The complete report might be used in one of several ways. It might serve as the primary agenda of a working party in the field. It might be given general circulation by publication in one of the institution's journals so as to stimulate individual research workers and sponsors. Or it might form the basis of a co-ordinated scheme of research sponsored, for instance, by the A.B.C.M. and B.C.P.M.A. However, it will remain the task of the individual research worker finally to crystallise his own programme within the framework indicated.

## Chemical engineers need more aggressive approach — Institution president

**W**HILE chemical engineers could be justly proud of their profession and their achievements they could not afford to rest on past laurels, said Mr. Colin E. Spearing, president of the Institution of Chemical Engineers, in his presidential address delivered after the annual general meeting of the Institution at the Park Lane Hotel, London, on Tuesday. Nor, for that matter, could they be at all certain that they had progressed over the past 40 years as rapidly as they might.

Appealing to chemical engineers here and abroad to take a more aggressive and constructive approach to the scope, delineation and evolution of their profession, Mr. Spearing said that, while not detracting in any way from individual and collective developments and achievements, the past three or four decades in chemical engineering practice, education, literature and development left something to be desired.

On the other hand, Mr. Spearing, who is a director of the Kellogg International Corporation, pointed out that the birth and the remarkable evolution of the chemical engineering profession to what it is today has taken place in the space of less than 50 years. Chemical engineers in Britain, together with their colleagues in the United States had been primarily responsible for this, he said, through their individual efforts, their corporate

and university activities and their professional societies—the Institution of Chemical Engineers and the American Institute of Chemical Engineers.

The rapidly emerging appreciation and interest in chemical engineering throughout the world made it essential for positive action to guide this continuing evolution. Whether one liked it or not, one could not ignore the impact of chemical engineering practices and philosophies on the delineation of the profession in Britain. Current world-wide circulation of technical literature, international conferences, and business activities and the possible participation of Britain in the European Common Market would not permit the development of a British chemical engineering discipline that would be unique and very different from that in other countries.

It was now quite obvious that increasing difficulties could be expected in recruiting the desired number of qualified students in view of the current and future emphasis on other fields. The answer was not to overlap into other areas but to maintain the research and inventive atmosphere that had always been identified with chemical engineering.

There was much to be done to develop real understanding of areas that were clearly within the province of chemical engineering and it was folly for chemical engineers to dilute their efforts



before they had devoted adequate attention to their established responsibilities. Chemical engineers could not leave it to chemists only to provide the theoretical foundations necessary for the proper understanding of the 'applied-physical-chemical' problems which were of commercial interest. Empirical techniques had been pressed to the point of diminishing returns in mass transfer, heat transfer, fluid mechanics, phase phenomena and kinetics.

Mr. Spearing ended by saying that members of the profession should continue to reappraise objectively their functions, scope, philosophies, and activities in industrial practices and utilisation of engineers, in education, in technical publications and books, interest in other countries and relations with other technical associations.

On Tuesday evening 420 members and guests attended the Institution's annual dinner and dance, also at the Park Lane Hotel. The toast of "The Institution" was proposed by Sir Harold Roxbee Cox, chairman of the Metal Box Co.

Ltd., chairman of the Council for Scientific and Industrial Research and chairman of the National Council for Technological Awards. Mr. Spearing proposed the toast of "Our Guests" and Mr. J. S. Fulton, vice-chancellor of the University of Sussex, responded.

### Officers for 1962-63

The Institution council is now made up as follows: *President*, C. E. Spearing; *Vice-Presidents*, Dr. G. P. Kane (re-elected), Prof. F. Morton, R. C. Odams, E. S. Sellers (re-elected); *Hon. Secretary*, F. E. Warner (re-elected), *Hon. Treasurer*, A. P. Buchanan.

*Ordinary members of the Council*: S. W. Adey, Prof. J. M. Coulson, Prof. P. V. Danckwerts, H. Fossett, L. Holliday, K. W. Palmer, J. A. Storrow, F. S. Wilkins, E. Woollatt; *associate members*: R. H. Bowers, W. G. Daroux, R. Parkins; *co-opted members*: K. W. Findlay, T. H. Gant, T. W. B. Flavel, G. U. Hopton, A. J. Moyes, A. S. White and A. D. Wilson.

## New fibre process licensed to Chemstrand and Courtaulds

AGREEMENTS to license have been concluded with Chemstrand Ltd. and Courtaulds Ltd. regarding a new process which will give a completely new range of fabrics made from man-made fibres. Developed by the Linen Industry Research Association the process yields a wide variety of yarns, given the name AtoZ yarns, from any one type of man-made fibre, and each yarn is tailored to give a fabric with chosen characteristics. AtoZ yarns have already been spun at Lambeg—the Association's headquarters—from Acrlan, Courtelle and other synthetics, and application of the process to flax and viscose fibres is being studied.

The Department of Scientific and Industrial Research say that the process is simple and can be carried out on existing machinery. Details of the process are still confidential, and are covered by patents so that the Linen Industry Research Association can claim priority in all important textile markets. Commercial exploitation is being arranged by Shirley Developments Ltd.

Throughout the development work, the L.I.R.A. has worked closely with those major producers of man-made fibres who are members of the Association. After studying the mechanism of creasing, the Research Association realised that, to achieve effective and permanent crease-resistance, a change in the structure of the yarn itself was necessary. This has been achieved in the structure of AtoZ yarns; they have an open structure in which each individual fibre is free to move within the yarn.

Negotiations regarding the manufacture of AtoZ yarns in the U.S. are at present in progress.

## Further hearings on Canadian tariffs

THE Canadian Tariff Board has announced dates for three further public hearings to be held in connection with the enquiry into the tariff items covering chemicals. The last of the series of hearing already announced will be held on 24 September 1962. The further hearings will be heard of 9 October 1962 (mainly dyes and colouring materials), 5 November (including surface active agents and detergents) and 19 November (including disinfectants, insecticides, herbicides etc.).

## Two B.O.C. subsidiaries amalgamated

THE business of British Oxygen Co.'s wholly-owned subsidiaries, Carbide Industries Ltd. at Maydown, Londonderry, and British Oxygen Chemicals at Chester-le-Street, Co. Durham, are being amalgamated.

The new company will be known as British Oxygen Chemicals. This arrangement involves no changes in operation of the plants.

## S.C.I. Surface Activity Group links academic and industrial spheres

PURE research which sometimes lacks realism and real achievement can be helped along by people who have a certain amount of day-to-day contact with what is happening and who are concerned with the economic facts of life. This is the view of F. Schon, chairman of Marchon Products Ltd., who proposed the toast of the Surface Activity Group of the Society of Chemical Industry at their annual dinner held at 55 Park Lane on 30 April.

The Surface Activity Group provides the opportunity for contact between purely academic scientists and eminent chemists in industry. Mr. Schon went on to say that the marriage between the basic thinker and the industrial scientist was of vital importance.

The detergent industry has made great strides. In the U.K. 640,000 tons of washing media are consumed a year, half of which are detergents, and the

value of detergents consumed is £77 million. Although the U.K. was the second country in the world to develop synthetic detergents, it is far behind other European countries on a basis of per capita consumption, and in the U.S. 90% of all washing media consumed are based on synthetic detergents.

Synthetic detergents have shown a good record as far as prices are concerned. Retail price index for all manufactured goods in 1961 was 118 (1954 = 100), but for synthetic detergents it was 98.

Sir Eric Rideal, F.R.S., retiring chairman, replied, and the chairman-elect, Sir Owen Wansbrough-Jones, proposed the toast of the guests.

An imbalance exists between the academic and industrial pursuit of colloid science, said Prof. A. R. Ubbelohde, F.R.S., who replied. Something, he thought, ought to be done about it.



L. to r., Mr. F. Schon, Prof. D. G. Dervichian Pasteur, Institute Paris, and Sir Eric Rideal

## New Kollerbond kit for emergency repairs

A NEWLY developed Kollerbond repair kit No. 1 for the emergency repair of chemical vessels, pumps, pipelines and other plant consists of pre-weighed quantities of Kollerbond resin, hardener, chopped strand reinforcement and all necessary auxiliary components to ensure an efficient job.

Operation is simple—the hardener is poured into the resin can and the two thoroughly mixed and then poured into the polythene bag containing the chopped strand reinforcement. The bag is then kneaded until the chopped glass strand is thoroughly impregnated, after which the bag is split open and the impregnated glass strand applied to the area to be repaired. Polythene gloves are provided. The patch is then covered with Cellophane held down with masking tape and the whole pressed firmly in position.

Setting takes three to four hours at room temperature, but can be speeded up by heating gently. The repair is ready



Kollerbond pipe kit. By Beck Koller and Co. (England) Ltd., Edwards Lane, Speke, Liverpool

for use the following day. It is stated to have good resistance to acids, chemicals and solvents and will stand moderate heat. It has been proved in use at the works of Beck Koller and Co. (England) Ltd., and at leading oil refineries.

## Keel of first U.K. methane tanker laid

THE keel of Britain's first tanker designed specifically for carrying liquid methane from the Sahara to a specially constructed terminal at Canvey Island, Essex, was laid recently at the Barrow-in-Furness yard of Vickers-Armstrongs.

The new vessel, costing about £3.5 million, will have the dimensions of a conventional tanker of about 28,000 tons and will carry about 12,000 tons of gas in nine aluminium tanks insulated with balsa wood as in the experimental vessel *Methane Pioneer*. Another vessel is to be built by Harland and Wolff.

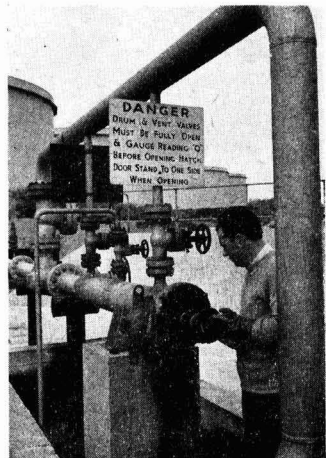
## Shell's new 23-mile pipeline comes up to expectations

THE new Shell-Mex and B.P. installation at Partington, Manchester, has for 18 months been supplied exclusively from Shell's Stanlow refinery, Ellesmere Port, 23 miles away, by two pipelines, one an 8-in. fuel oil line and the other a 6-in. gas oil/gasoline line. The project has come fully up to expectations, the company reports, and has resulted in a substantial saving in freight and handling charges.

The pipelines are part of a six-line complex laid in 1960, the other four being used for transferring feedstock, chemical intermediates and finished products between Stanlow and the Carrington works of Petrochemicals Ltd., close to Shell-Mex's Partington depot. They pass mainly through agricultural land and, with the exception of a 700-yd. section over marshland, are buried with a minimum cover of 2 ft. 6 in.

Twenty-seven roads, three railways, two rivers and two canals are negotiated en route, and 16 valve pits are installed to allow isolation of sections in an emergency. The lines are 'walked' daily by a pipeline patrol vehicle equipped with radio, and a direct telephone link is provided between the control rooms at either end.

The line is used to transfer three grades of gas oil and three grades of gasoline. Direct product-to-product pumping is employed without mechanical separation of grades, at flow rates high enough to ensure turbulent flow. Maintenance of turbulent flow ensures that interface contamination is negli-



A 'go-devil' hatch at the Stanlow end of the Shell pipeline system

gible, and little down-grading of products occurs.

The time of arrival of an interface at the flow rate, and spotted precisely by an autogravitometer. When only a small change in gravity occurs between consecutive grades, a rubber sphere is inserted at the interface and the time of arrival of the sphere is indicated by an audible alarm. Accurate switching of grades is facilitated by the use of automatic quick acting valves.

## Trading in fuel elements contributes to Atomic Energy Authority's loss

ACCORDING to the U.K. Atomic Energy Authority's balance sheet for 1960-61, a net loss of £1.9 million was incurred in the Authority's trading in fuel elements, graphite and isotopes. Sir Edmund Compton, Comptroller and Auditor General, in his accompanying report, refers to expenditure on work on magnox fuel elements and says that if the actual expenditure on this had been charged against income from sales the total trading loss would have been increased to £5.5 million. Asked why they had not done this, the Authority had told him that their policy was that expenditure on development should be included in net cost of operations as incurred, while recoveries should be brought to credit as they arose.

Most of the trading loss, the Authority had said, arose as a result of firm price quotations having been made by the Authority in 1956 for the initial supplies of fuel elements for the first three power stations. These had been made as part of the Authority's contribution to

the introduction of nuclear power and they had accepted the risk that a loss might result.

## B.D.H. 1962 turnover shows improvement

CONSTANT erosion of profit margins makes it unusually difficult to forecast results, stated Mr. G. Eley, chairman of British Drug Houses, in the company's annual statement. However, group turnover for 1962 has shown some improvement on last year. Group sales rose by 7½% to a record £11.7 million in 1961.

B.D.H.'s development programme went ahead according to plan during the year, resulting in an increase of £767,111.

Regarding the projected oral contraceptive, Mr. Eley said that the directors are not yet certain that the optimum formulation has been achieved, and that in the circumstances he does not feel able to put a probable date to their reaching a decision on marketing.

# U.K. foreign trade in chemicals, Jan.—March

IMPORTS	QUANTITY		VALUE	
	Jan.-Mar. 1961	Jan.-Mar. 1962	Jan.-Mar. 1961	Jan.-Mar. 1962
<b>INORGANIC</b>			£	£
Boric acid . . . . . Cwt.	24,829	18,521	84,047	56,326
Arsenic trioxide . . . . . Tons	421	1,047	12,317	30,680
Aluminium oxide . . . . . "	5,350	4,062	322,672	260,694
Silicon carbide . . . . . "	3,042	4,145	271,903	414,101
Borax . . . . . Cwt.	154,707	108,837	272,392	281,023
Calcium carbide . . . . . "	593,503	173,520	1,035,076	318,121
Channel black . . . . . "	37,328	36,462	258,853	250,715
Other carbon blacks . . . . . "	37,080	37,423	178,781	180,798
Cobalt oxides . . . . . "	5,460	2,718	229,500	113,059
Iodine . . . . . Lb.	469,536	391,606	178,350	150,490
Mercury . . . . . Cwt.	613,963	482,479	543,732	369,481
Potassium carbonate . . . . . Cwt.	32,296	19,802	95,973	56,405
Selenium . . . . . Lb.	78,435	74,552	81,483	142,712
Silicon . . . . . Tons	1,826	2,091	309,945	317,080
Sodium chlorate . . . . . Cwt.	14,016	34,515	41,058	115,809
Titanium oxides . . . . . "	2,741	8,970	30,125	77,906
Other inorganics, n.e.s. . . . . "	—	—	2,069,798	2,133,142
<b>ORGANIC</b>				
Acids, anhydrides . . . . . "	—	—	921,531	586,714
Glycerine . . . . . Cwt.	23,124	6,395	146,729	36,430
Menthol . . . . . Lb.	22,024	45,687	53,891	82,123
Alcohols & mixtures . . . . . Cwt.	187,838	115,468	796,336	611,742
Turpentine . . . . . Gall.	102,066	37,665	18,244	7,090
Styrene (mon.) . . . . . Tons	838,019	412,656	314,196	138,623
Vinyl acetate (mon.) . . . . . Tons	3,016	1,587	333,977	159,771
Organic cpds., n.e.s. . . . . "	—	—	8,258,209	8,268,172
<b>MISCELLANEOUS</b>				
Syn. dyestuffs . . . . . Cwt.	13,994	14,712	1,303,233	1,477,492
Pigments & extenders . . . . . "	39,460	32,377	74,416	71,216
Other pigments, paints . . . . . "	—	—	465,886	—
Anti biotics . . . . . "	—	—	384,013	287,477
Alkaloids . . . . . "	—	—	223,544	225,720
Proprietary n.e.s. . . . . "	—	—	277,979	233,345
All other drugs . . . . . "	—	—	783,543	696,105
Essential oils . . . . . Lb.	2,235,496	2,223,187	2,128,998	1,744,535
Perfumery, toilettries . . . . . "	—	—	338,977	346,277
Starch, etc. . . . . Tons	733,571	620,548	1,456,853	1,175,498
Gas & chem. machinery . . . . . "	7,201	4,278	257,533	290,411
<b>AGRICULTURAL</b>				
Phosphates of lime . . . . . Tons	358,417	332,646	2,104,221	1,957,933
Sulphur . . . . . Tons	132,006	131,901	1,335,177	1,379,421
N fertilisers . . . . . Cwt.	1,882,622	1,328,405	1,429,432	913,368
Basic slag . . . . . Tons	21,719	30,625	170,172	216,685
Potassium chloride . . . . . Cwt.	3,988,939	3,903,744	2,895,422	2,991,666
Potassium sulphate . . . . . Tons	161,889	179,616	136,161	159,975
Other fertilisers . . . . . "	—	—	1,209,321	1,431,664
Disinfectants, insecticides, etc. . . . . Cwt.	14,363	16,445	437,761	309,027
<b>PLASTICS</b>				
Alkyls . . . . . Cwt.	11,779	12,742	112,747	134,274
Polyamides . . . . . "	22,742	10,066	796,779	400,059
Acrylics . . . . . "	18,610	21,775	322,656	343,748
Polystyrene . . . . . "	18,064	14,542	219,090	175,510
P.v.c. polymers, copolymers . . . . . "	110,802	125,251	826,890	876,527
Other P.v.c. . . . . "	34,524	53,708	577,435	748,279
Cellulose acetate butyrate . . . . . "	7,033	5,991	348,911	242,719
Other plastics* . . . . . "	184,915	258,257	4,092,341	4,752,678

EXPORTS	QUANTITY		VALUE	
	Jan.-Mar. 1961	Jan.-Mar. 1962	Jan.-Mar. 1961	Jan.-Mar. 1962
<b>INORGANIC</b>				
Acids . . . . . Cwt.	73,870	51,672	383,392	234,264
Copper sulphate . . . . . Tons	10,405	6,478	777,016	488,909
Sodium hydroxide . . . . . "	61,450	52,791	1,103,175	950,181
Sodium carbonate . . . . . "	66,308	52,295	742,046	539,373
Aluminium oxides . . . . . "	9,852	3,258	345,551	154,564
Al. sulphate, etc. . . . . "	9,043	8,247	156,679	143,229
Ammonia . . . . . Cwt.	21,079	27,593	66,228	94,494
Ammonium cpds. (not fertilisers)* . . . . . Tons	7,885	6,989	279,530	246,418
Arsenic cpds. . . . . Tons	1,979	2,379	138,766	160,644
Bismuth cpds. . . . . Lb.	126,202	78,011	97,140	59,336
Chloride of lime . . . . . Tons	4,217	3,224	153,107	120,389
Hydrosulphite . . . . . Cwt.	19,609	19,268	154,564	140,851
Other bleaching mats. . . . . "	55,777	64,049	254,302	282,174
Calcium cpds. . . . . "	95,341	99,316	215,094	215,261
Carbon blacks . . . . . "	262,204	224,120	953,291	781,129
Cobalt cpds. . . . . "	5,659	4,610	134,607	118,483
Iron oxides . . . . . "	25,463	25,730	83,535	87,758
Lead cpds. . . . . "	17,899	22,367	80,220	92,951
Magnesium cpds., n.e.s. Tons	5,311	3,930	282,839	223,932
Nickel salts . . . . . Cwt.	28,014	31,099	261,598	309,368
Potassium cpds (not fertilisers)* . . . . . Tons	20,587	19,247	167,246	163,101
Sodium bicarbonate . . . . . Tons	9,526	9,667	168,536	158,658
Chromate & dichromate . . . . . Cwt.	10,492	16,094	46,193	66,791

\* Figures for 1962 are not strictly comparable with 1961

(Continued in next column)

Exports (continued from previous column)

Phosphates . . . . . Tons	85,230	89,886	313,448	326,862
Silicate . . . . . "	88,387	127,102	93,967	116,802
Other sodium cpds.* . . . . . "	333,121	373,885	941,878	815,898
Tin oxide . . . . . Tons	2,324	2,297	86,772	104,146
Zinc oxide . . . . . "	2,199	2,341	165,416	172,458
Other inorganics n.e.s.* . . . . . Tons	—	—	1,528,894	1,375,773
Radioactive elements & cpds. . . . . "	—	—	90,000	108,749
<b>ORGANIC</b>				
Acids, anhydrides . . . . . Cwt.	6,761	23,464	1,007,580	847,777
Glycerine . . . . . "	—	—	74,423	179,950
Ethyl alcohol, etc. . . . . Cwt.	53,312	43,647	1,245,382	1,358,497
Acetone . . . . . "	23,684	28,458	195,468	196,784
Citric acid . . . . . Cwt.	87,915	104,184	335,530	525,467
Sodium cpds. . . . . Tons	10,196	10,373	185,680	160,236
Sulphonamides . . . . . Lb.	378,535	411,355	209,456	242,069
Dye intermediates . . . . . Cwt.	20,005	22,889	356,186	422,209
Other organics . . . . . "	—	—	6,193,678	6,536,907
<b>MISCELLANEOUS</b>				
Coal tar . . . . . Tons	11,328	10,612	138,332	123,645
Cresylic acid . . . . . Gall.	639,610	624,549	251,723	255,620
Creosote oil . . . . . "	6,397,668	3,711,796	428,280	308,367
Other min. tar, etc. . . . . "	—	—	213,547	207,077
Pigment dye-stuffs . . . . . Cwt.	9,553	10,376	453,851	436,029
Other syn. dyes . . . . . "	65,187	59,319	3,191,181	3,193,898
Syn. pigments . . . . . "	7,186	5,937	331,912	249,846
Pigments, paint, etc. . . . . "	—	—	8,084,905	7,654,563
Explosives . . . . . "	—	—	2,756,939	2,520,494
Carbons . . . . . Cwt.	30,195	18,510	134,263	82,017
Tetraethyl lead . . . . . Gall.	1,672,308	1,417,219	3,113,396	2,805,222
Drugs, etc. . . . . "	—	—	12,131,920	12,274,609
Antibiotics . . . . . "	—	—	2,379,209	2,741,957
Essential oils . . . . . Lb.	774,793	855,490	812,963	869,101
Flavourings . . . . . "	—	—	481,422	444,302
Gas & chem. machinery Cwt.	41,336	56,353	1,323,039	2,032,022
<b>AGRICULTURAL</b>				
N fertilisers . . . . . Tons	12,995	84,755	172,140	988,917
All other ferfs. . . . . "	—	—	55,799	281,867
Disinfectants, insecticides, etc. . . . . Cwt.	176,669	166,015	2,189,187	2,071,428
<b>PLASTICS MATERIALS</b>				
Alkyls . . . . . Cwt.	29,126	36,523	285,549	383,362
Aminoplastics . . . . . "	107,686	91,748	760,741	658,416
Phenolics & cresylics . . . . . "	64,330	83,668	671,836	766,656
Polystyrene . . . . . "	84,028	100,712	883,341	883,341
Polyolefins* . . . . . "	8,399	317,527	149,818	2,170,684
P.v.c., all types . . . . . "	241,092	257,062	2,492,270	4,297,742

\* Figures for 1962 are not strictly comparable with 1961

## TRADE WITH PRINCIPAL MARKETS

	EXPORTS		IMPORTS	
	(£'000)		(£'000)	
	Country	Jan.-Mar. 1961	Jan.-Mar. 1962	Jan.-Mar. 1962
E.F.T.A.	Austria . . . . .	588	363	—
	Denmark . . . . .	1,817	1,959	315
	Finland† . . . . .	1,127	1,128	966
	Norway . . . . .	1,406	1,497	1,005
	Portugal . . . . .	984	1,114	657
	Sweden . . . . .	3,111	3,156	809
	Switzerland . . . . .	1,194	1,351	2,128
<b>Total</b>	<b>10,227</b>	<b>10,568</b>	<b>4,915</b>	<b>4,428</b>
E.E.C.	Belgium . . . . .	1,828	2,076	1,374
	France . . . . .	2,380	2,246	4,130
	Germany . . . . .	2,619	2,982	7,577
	Italy . . . . .	2,851	2,870	2,064
	Netherlands . . . . .	4,163	4,027	4,382
<b>Total</b>	<b>13,841</b>	<b>14,201</b>	<b>19,547</b>	<b>18,610</b>
Soviet bloc	China . . . . .	567	290	141
	Czechoslovakia . . . . .	394	496	783
	Germany, E. . . . .	200	292	—
	Hungary . . . . .	706	832	590
	Poland . . . . .	1,080	1,377	280
	Soviet Union . . . . .	—	—	355
<b>Total</b>	<b>2,947</b>	<b>2,287</b>	<b>1,794</b>	<b>1,778</b>
Commonwealth	Australia . . . . .	6,247	6,093	169
	Canada . . . . .	1,693	2,095	2,110
	Ceylon . . . . .	724	1,043	48
	China . . . . .	1,992	1,166	—
	Hong Kong . . . . .	1,476	1,573	31
	India . . . . .	3,415	3,631	294
	Malaya . . . . .	2,144	1,192	36
	New Zealand . . . . .	1,161	1,739	294
	Nigeria . . . . .	2,386	1,751	—
	Pakistan . . . . .	1,313	1,254	—
<b>Total (all Commonwealth)</b>	<b>30,819</b>	<b>29,317</b>	<b>4,001</b>	<b>3,584</b>
Other Countries	Argentina . . . . .	838	857	175
	Brazil . . . . .	958	851	165
	Eire . . . . .	2,675	2,654	186
	Japan . . . . .	1,037	1,047	496
	South Africa . . . . .	3,602	2,943	680
	United States . . . . .	3,048	3,038	12,611
Venezuela . . . . .	961	818	—	
<b>Total, all countries</b>	<b>85,092</b>	<b>83,975</b>	<b>46,322</b>	<b>43,274</b>

† Associated member of E.F.T.A.

## Overseas News

# Saar chemical expansion plans may include oil refinery

THE Saar coal-mining crisis has led to plans for new chemical facilities in the Federal German State, according to the Saar Minister of Trade. They are expected to include nitrogen and oxygen synthesis units, for which cheap local sources are available. Further, with a view to retaining for the State-owned coal-mining concern Saarbergwerke AG, of Saarbrücken, its share of the power and heating market the establishment of an oil refinery is being studied. Financing both Federal and State Governments' investment programmes—particularly coal processing and the expansion of chemical and mineral oil processing plants—was given by the Minister as one way of supporting the Saarbergwerke in the future.

## Interest reported in a Lebanese chemical industry

Interest is reported in official circles in the Lebanon in establishing there licensed manufacture of chemical and pharmaceutical products.

## U.S. now a source for polyurethane catalysts

Baird Chemical Corp., New York, have available commercial quantities of barlene LM-lauryl morpholine, and barlene EM-ethyl morpholine, thus establishing the first source for these polyurethane catalysts in the U.S.

## Agreement concluded between Bayer and Chemstrand

An agreement has been concluded between Chemstrand and Bayer which makes it possible to export Acrilan fibre and products based on it to the German Federal Republic from Holland and other countries.

Such exports were subject to restrictions before the agreement was made.

## Sasol synthesis gas contract for Air Liquide

Air Liquide of France are to supply a large-scale synthesis gas plant to Sasol of South Africa. Gas produced will be used for the production of 150 tons/day of ammonia.

## Japan concludes S.E. Asian fertiliser barter deals

Japanese fertiliser producers have recently concluded a number of triangular trade agreements with South-East Asian countries and have also been successful in bartering fertiliser for agricultural pro-

ducts. In addition, the industry is bringing strong pressure to bear on the Government to import more rice from South-east Asia in return for fertiliser export contracts.

Last year, exports of ammonium sulphate dropped by 84% and although sales of urea and compound chemical fertilisers rose, overall fertiliser exports were only about 90% of those for 1960—itself a poor year.

## £27 million oil plant planned in Egypt

A crude oil carbonising plant for the extraction of oil by-products is under construction by the General Oil Authority of Egypt. The plant will cost £27 million and an output of 1.7 million tons of fuel oil a year is aimed at.

# St-Gobain take part in Greek venture

A NEW company, Chemical Industry of Northern Greece, has been formed in which the French company St. Gobain and the Greek Chemical Products and Fertiliser Co. each hold a 40% interest. The remaining 20% is held by the National Bank of Greece. The new company, with a capital of \$6 million, is to start construction of a plant for the production of sulphuric and phosphoric acids. The 120 ton-a-day plant will be sited near Piraeus.

Another plant will be built in Northern Greece for the manufacture of nitrogenous and phosphatic fertilisers. The capacity will be of the order to 200,000 tons a year.

## 48,000 million dinar for Yugoslav chemical project

A sum of 48,000 million Yugoslav dinars is now given as necessary for construction of the first phase of the Novo Velenje chemical combine in that country. It is now known that the German Soviet Zone will provide much of the plant and equipment for the lignite-based combine. The Novo Velenje plant, to take a total of 15 years to build to completion, will produce synthetic rubber and other synthetic materials.

## Spain must still import nitrogenous fertilisers

Spanish production of nitrogenous fertilisers is only one-third of total requirements. Since 1951 when nitrogen production was below 2,400 tons, pro-

## Decision reached on Trieste-Vienna pipeline

Following discussions with E.N.I., the Austrian Government states that the projected Trieste-Vienna Pipeline Co. must be controlled by the Austrian State oil concern, O.M.V. Overseas companies will only be allowed to hold minority interests—Royal Dutch/Shell, B.P., Esso and Mobil have all shown interest in the project.

The pipeline will have a capacity of between 3 million and 6 million tonnes a year.

## Singapore development may include resin plants

Synthetic resins plants are reported to be planned for a 16½ sq. km. industrial development site in Singapore. It is understood that Japanese industries are being approached to take part in the industrialisation of Singapore, particularly as far as this area is concerned, and under preferential conditions.

## Wavin to build plant in Austria

The Dutch chemical company, Wavin, are to establish a subsidiary plant in Austria for the production of p.v.c. pipes. The Dutch company also have production facilities in Germany and Denmark.

gressive expansion has brought output to 129,000 tons. Even if the planned capacity of some 390,000 tons is achieved by 1965, Spain is not expected to become self-sufficient in nitrogen. Imports of some 100,000 tons ammonium sulphate, Chilean sodium nitrate and calcium nitrate are to continue for some time, although urea and complex fertilisers may soon be in excess of domestic demand.

## Nippon Rayon acquire Emser caprolactam licence

Nippon Rayon have been granted a licence by the Swiss company Emser Werke for the manufacture of caprolactam, and have made an application to the Japanese Government for permission to build a plant.

Three applications involving different caprolactam processes are now under consideration by the Ministry of Trade. The others are the Toyo Rayon and the Snia Viscosa processes.

## Glycerol price reductions in the U.S.

Proctor and Gamble have announced price reductions of 2 cents a lb for natural and synthetic glycerol. Other U.S. manufacturers have followed. The new tank car price is 21½ cents for 96% grade and 22½ cents for 99% chemically pure grade. The new prices are the lowest for 15 years.

## Overseas news

# Cyanamid expect 1962 sales to exceed average U.S. growth

THE first quarter of 1962 saw the American Cyanamid Company log the highest sales and earnings in any three-month period in its history, according to a statement by Dr. W. G. Malcolm, chairman of the board and chief executive officer, at the company's recent annual meeting. At \$17,226,000, or 81 cents a share, earnings were 41% higher than the \$12,176,000, or 57 cents a share, earned in the same period of 1961, Dr. Malcolm said. The previous record was \$16,536,000, or 78 cents a share, achieved in the first quarter of 1960.

While gains were registered generally throughout the firm's product line, sales of Lederle pharmaceuticals, Formica laminated plastics, and plastics and resins generally were significantly higher than last year and Cyanamid International set a new sales record in the first quarter. Lederle's increased sales volume was largely attributed to unusually high antibiotic sales related to worldwide outbreaks of respiratory infections.

Commenting on prospects for the balance of 1962, Dr. Malcolm said that if the present trend of business continued improvement in Cyanamid's sales should at least approximate to, and probably exceed, the 8% growth rate estimated for the chemical industry as a whole. He added that improvement in profits should be somewhat higher.

### U.S. interest in Senegal phosphates

The International Minerals and Chemical Corporation of Chicago, a firm engaged in the production of fertilisers and agricultural chemicals, has become a partner in the Cie. Sénégalaise des Phosphates de Taïba, of Dakar—thus becoming the first U.S. firm to participate in the industrial development of Senegal. The company produces some 500,000 t.p.a. of high-grade phosphates and has a total capital of \$25 million, subscribed by French and U.S. interests and by the Government of Senegal.

### Brazil imports more chemicals

Brazil's imports of chemical and pharmaceutical products in 1961 totalled U.S. \$145.8 million or 10% of her total imports (1960: U.S. \$139.2 million and 9.5%).

### Esso plan new polybutadiene facilities in France

The French Esso subsidiary Esso Standard S.A., are reported to be plan-

ning the construction of commercial-scale units for the manufacture of polybutadiene and polyaromatic plastics (types Escorez 1000 and Escorez 3000 respectively). These plastics, plans for whose production follows the announcement of other petrochemical projects at the Esso Standard Port-Jérôme plant, are already in test production at the l'Estaque plant of Standard-Kuhlmann.

### Japanese chemical exports expected to rise 22% this year

According to a statement issued by the Japanese Ministry for Foreign Trade and Industry, Japanese chemical industry exports are expected to reach some \$227,570,000 over the current year, or 22% more than last year's total.

## New cationic polymer from Hercules Powder

A NEW cationic polymer, intended for use as a flocculant in chemical process streams among other applications, has been introduced by the Cellulose and Protein Product Department of the U.S. company, Hercules Powder. Called Reten 205, the polymer can also be used as a retention aid in paper making and as a flocculant in waste water purification, sewage treatment, water clarification, and in mineral beneficiation.

The synthetic polymer is strongly cationic of high molecular weight. It is available as a white finely divided powder which dissolves in both hot and cold water to give clear, smooth solutions of high viscosity.

Reten 205 also shows good film properties and its adhesive qualities suggest its use as a size for synthetic fibres as well as an antistatic coating for plastic film paper and yarns.

### Chemical fibres body supports Swiss price stability

Following recent assurances by the Swiss chemical industry that it will not raise prices during this year (C.A., 17 Feb., p. 285 and 31 March, p. 533) it is reported the main Swiss artificial and synthetic fibre producers' body, Verband Schweizerischer Kunstseide-Fabriken, has also made such a pledge. Members of the body include the manufacturing firms Société de la Viscose Suisse S.A., of Emmenbrücke, Feldmühle AG, of Rorschach, and Steckborn Kunstseide

### U.S. hazardous substances regulations amended

Amendment to the U.S. Federal Hazardous Substances Act exempts packages containing polishing and cleaning products which consist of absorbent material impregnated with petroleum distillates (provided the liquid is fully absorbed and cannot be expressed) from the special labelling requirements prescribed for products containing 10% or more of petroleum distillates. The preparations covered by this exemption must still be labelled in accordance with the general requirements of the Act.

### Swiss aluminium company to produce plastics

Aluminium-Industrie-AG, of Chippis, Switzerland, one of the world's leading aluminium concerns, has announced its intention to enter the field of plastics production.

### Expansion in Soviet chemical plant output

During 1961, chemical industry equipment worth some 240,500,000 New Roubles was produced in the Soviet Union, it is announced from Moscow. This is about 7% above the 224,000,000 New Roubles' worth recorded for 1960.

AG, of Steckborn. The pledge, made on the assumption that no extraordinary political or economic occurrences alter the supply and price structure, covers both raw and spinning fibres and yarns.

### Dutch-U.S. nylon co-operation

The U.S. Polymer Corporation and Algemene Kunstzijde Unie (A.K.U.), of Arnhem, Holland, have jointly prepared a programme for stimulating the production and use of nylon rod. Part of the new programme provides that Polymer and A.K.U. patents will be made available to licensees in a number of countries as an aid to the production of industrial semi-manufactures made of nylon. Applications for licences will be dealt with by A.K.U.

### Steep rise in Belgium's investment in chemicals

Some B.Fr.3,400 million (£24.2 million) were invested by the Belgian chemical industry in 1961, compared with a total of B.Fr.2,500 million (£17.7 million) in 1960.

### Peruvian chemical investments rise

Chemicals are sharing in new capital invested in Peru, rising from U.S. \$1.42 million in 1960 to U.S. \$2.95 million in 1961.



## Bookshelf

# Chemistry of autoxidation

AUTOXIDATION AND ANTIOXIDANTS, VOL. 1. Edited by *W. O. Lundberg*. Wiley, London, 1961. Pp. xiv + 450. 117s.

Editor Lundberg has assembled a group of well-qualified authors from several countries to produce this first part of a two-volume work. He is forced to apologise for the delay in the publication of several of the sections. One cannot help reflecting that some of the authors could have written a more satisfactory book without outside help; such a book should have been uniform and up to date.

The first chapter deals, logically enough, with the primary products of olefinic oxidations (55 pages) and is followed by one by Uri of 52 pages on the physical chemistry of autoxidation. The basic kinetic studies are discussed and related to thermodynamic properties. Most of the information comes from British studies that are now more than 10 years old. It is unusual for a branch of kinetics to lie dormant for so long. Mesrobian and Tobolsky deal with catalysis and Uri with antioxidation. Homer has taken on the rather thankless task of 'Autoxidation of various organic substances' which is followed by a

specialised chapter on cholesterol. Livingston writes most interestingly on photochemical autoxidation. It is to be hoped that many people who will not otherwise look at the book will read this chapter. Ionising radiation gets its own chapter. After a chapter on biocatalysts, this book is completed by a chapter, which might well have come second on the analysis of autoxidation mixtures.

This book will be useful to all those connected with this field and many others could study some of it with profit.

## ► Dictionary

GERMAN / ENGLISH DICTIONARY OF CHEMISTRY. *Richard Ernst*. Pitman, 1962. Pp. 727. 52s 6d.

This new dictionary contains some 45,000 technical terms covering chemistry and chemical technology, and also those aspects of related sciences such as geology and mathematics which seemed to the author to be relevant. This is a purely technical compilation, omitting common words which are necessarily to be found in any scientific text, but including terms which are the same or almost so in both

languages. It is therefore designed to supplement rather than displace dictionaries already available, and by its comprehensive coverage of its particular field will appeal more to libraries and the specialist translator than to the average chemist.

## ► Crystal properties

MOLECULAR STRUCTURE AND THE PROPERTIES OF LIQUID CRYSTALS. By *G. W. Gray*. Academic Press, London and New York, 1962. Pp. vi + 314. 63s.

This account of thermotropic mesomorphism is written from the point of view of the organic chemist. It summarises in an acceptable descriptive fashion the extensive observations which have been made and relates these to the general structural features of the various 'homologous' molecules involved.

There are short chapters on the basic observations; the swarm theory and its rivals; spectroscopic and other physical studies; the behaviour of mixtures. Longer accounts follow on mesomorphism and chemical constitution (58 pp); transition temperatures in homologous series (42 pp); effects of substituents on mesomorphic stabilities (62 pp).

It is disappointing to find that a (if not *the*) key physical factor, the Kerr constant, receives a mention in one paragraph but is absent from the indices, and that there is no quantitative physical theory in this volume.

FORTHCOMING . . . .

## PROGRESS IN STEREOCHEMISTRY—3

Editors: P. B. D. de la MARE and W. KLYNE

Price 75s.

The success of Volumes 1 and 2 in the "Progress Series" has encouraged the publication of a third volume. Like its predecessors, this volume contains chapters dealing with topics in physical, inorganic, organic and biological chemistry.

## ELECTROLYTE SOLUTIONS

R. A. ROBINSON and R. H. STOKES

Price 65s.

This book presents a detailed account of some of the most fundamental properties of electrolyte solutions: conductance, chemical potential and diffusion. Modern experimental methods are discussed and extensive experimental results are given.

**BUTTERWORTHS, 4-5 Bell Yard, London, W.C.2.**

● **Mr. P. O. de Gale** has joined Elcontrol Ltd., Wilbury Way, Hitchin, Herts, manufacturers of electronic and automation equipment, as commercial manager. He was previously with the Permacel and Chilton companies.

● **Mr. S. W. Martin** chairman since 1954 of the Staveley Iron and Chemical Co. Ltd. near Chesterfield, will retire on 1 June. He will be succeeded by **Mr. N. C. Macdiarmid**. Mr. Martin has spent the whole of his working life with the company. Starting in 1907 as an assistant in the foundry laboratories, he became chief chemist in 1919. He was particularly concerned with the installation of the electrolytic chemical processes and the development of the British Soda Co. Ltd., at Sandbach, of which he was, at one time, managing director, as well as a director of Philblack Ltd. and the Birmingham Chemical Co. Ltd. He is president of the Midland Merchant Blast Furnace Owners' Association and he served on the Regional Chemical Committee from 1940 to 1945.

● **Mr. V. D. Worstall**, who has been appointed technical director of Lever Brothers, Port Sunlight, Ltd., from 1 May, fills the vacancy on the board created by the retirement of **Mr. Alfred Watson**, and his appointment will result in certain changes in directors' responsibilities. As present head of the process development division, Unilever research laboratory, Port Sunlight, Mr. Worstall is responsible for the pilot scale development of plant and processes for detergents, margarine and edible oils. He also



V. D. Worstall

has charge of the research and development at Port Sunlight in support of the United Africa Company's timber activities. Born in Swansea 43 years ago, Mr. Worstall was a contemporary of Dylan Thomas at Swansea Grammar School and obtained his B.Sc. at Swansea University. An associate member of the R.I.C., he came to Port Sunlight in 1939 as a chemist in the works laboratory, transferring to the hardening plant as shift chemist in 1940. From 1942 to 1947 he served in R.E.M.E., becoming a captain on radar operations, subsequently returning to the hardening plant. In July 1947 he moved to works development department as assistant to the manager, later assuming duties of deputy.

● **Mr. W. E. Cartwright**, of Benzole Producers Ltd., was elected president of the National Benzole and Allied Products Association, and **Mr. C. J. Waller**, of Scottish Tar Distillers Ltd., was elected vice-president for the ensuing year. The Executive Committee was elected as

## PEOPLE in the news

follows: **Mr. L. W. Blundell**, North Thames Gas Board; **Mr. A. Bradley**, National Coal Board, Headquarters; **Mr. G. Hanna**, Dorman Long (Chemicals) Ltd.; **Mr. H. V. Holmes**, National Coal Board, Durham Division; **Mr. W. D. Holt**, Lancashire Tar Distillers Ltd.; **Mr. C. J. Johnson**, North Thames Gas Board; **Mr. J. E. Jones**, South Eastern Gas Board; **Mr. C. N. Kemp**, South Western Tar Distilleries; **Mr. M. J. R. Lane**, Lincolnshire Chemical Co. Ltd.; **Mr. D. G. Moody**, United Coke and Chemicals Co. Ltd.; **Mr. W. A. Robinson**, The Midland Tar Distillers Ltd.; **Mr. A. Slater**, The Staveley Iron and Chemical Co. Ltd.

● **Mr. W. E. Tansley** and **Mr. V. Francis** have been appointed directors of the British Soda Co. Ltd., one of the Staveley Group. Mr. Tansley is works manager at the Sandbach plant of British Soda and Mr. Francis manager of the vacuum salt works at Stafford.

● **Mr. D. H. Carter**, chairman of the I.C.I. General Chemicals Division, Liverpool, and **Mr. J. Pearcy**, assistant

accountant of the division, have been appointed directors of the Weardale Lead Co. Ltd. I.C.I. recently acquired a 51% interest in this company and Mr. Carter and Mr. Pearcy replace **Mr. H. Allison** and **Mr. E. J. Deas** who have resigned from the board.

● **Mr. Gordon Kiddoo** has been appointed vice-president of Houdry Process and Chemical Company, and head of the firm's new Commercial Development Division. He has been recently associated with Air Products and Chemicals, Inc., with whom Houdry have recently merged.

● **Mr. Denis E. Wheeler**, managing director of The Wellcome Foundation Ltd., has been appointed president of the Association of the British Pharmaceutical Industry for 1962-63. The new vice-president is **Mr. Philip Mair**, managing director of CIBA Laboratories Ltd. **Mr. H. W. Palmer**, director and general manager of Glaxo Group Ltd., becomes the immediate past president and **Mr. G. T. Morson**, managing director of Thomas Morson & Son Ltd., has been re-appointed as honorary treasurer.

● **Mr. G. D. Bond** has been appointed chairman of Bonded Fibre Fabric, a subsidiary of Courtaulds. He succeeds **Mr. J. P. Koppel** who recently joined the parent board. Mr. Bond is also senior managing director of British Cellophane.

● **Mr. W. Baumgartner** has been appointed a director of Péchiney.

● **Mr. A. J. Moyes**, of Leeds, was elected chairman at the recent inaugural meeting of the Yorkshire branch of the Institution of Chemical Engineers, at which the president of the Institution, **Mr. C. E. Spearing**, presided. Other officers elected were: deputy chairman, **Mr. K. L. Butcher**, Leeds University; hon. treasurer, **Mr. J. J. Priestley**, W. C. Holmes and Co., Huddersfield; hon. secretary, **Mr. A. G. Pollard**, Leeds.

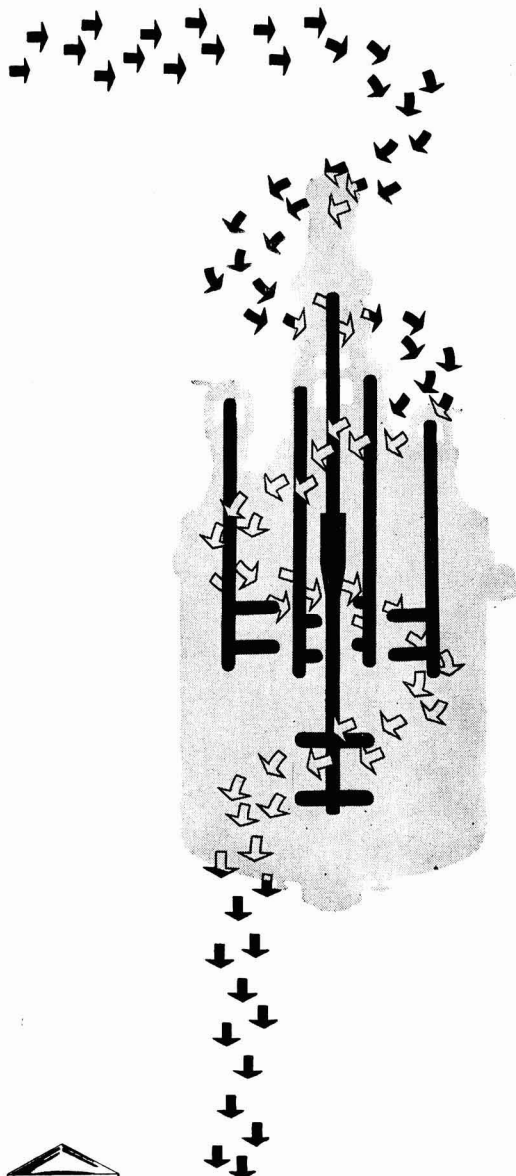
## German visits water softener company



Herr Erich Samendinger (second from r.), chief engineer and sales manager, Philipp Muller Nachf. Eugen Bucher and Co., Stuttgart, seen with his wife at the works of Aberdare Engineering Ltd., Aberdare, Glamorgan, where he inspected equipment under construction for the Neckar Water Softener Co., a member of the Aberdare Holdings Group. Also in the picture (l. to r.) are Mr. H. E. Wallsom, Neckar director and general manager; Mr. S. Chell, company secretary; and Mr. A. S. Brown, Aberdare Engineering director and general manager. Main purpose of Herr Samendinger's visit to Britain—his first—was to see the pilot plant contact reactor which Neckar have had in operation since February for the North Thames Gas Board. Originally developed by the Stuttgart company, this reactor is made and sold in Britain exclusively by Neckar



## Metal alkoxides and acetylacetonates



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## Commercial News

### British Petroleum

Group income of British Petroleum for 1961 was £142.1 million (£144.9 million). After tax of £81.5 million (£82.5 million) net income was £60.6 million (£62.4 million). Proceeds from group sales totalled £1,011.6 million (£937 million). After Customs and Excise duties of £332.2 million (£290 million) net sales proceeds were £679.4 million (£647 million). Final dividend is 1s 5d, tax free, making 1s 11½d (against an equivalent of 1s 11½d).

Group sales tonnage in 1961 was 78.3 million (72.9 million) tons.

### Dunlop Rubber

Consolidated net profit of the Dunlop Rubber Co. for 1961 was £7,179,000 (£6,662,000) and the dividend is unchanged at 1s 7d per 10s share.

The proportion of synthetic in relation to the total consumption of rubber increased from 44% to 47%.

### I.C.I.-Courtaulds

The Stock Exchange Council has approved a special procedure for the settlement of the payment which I.C.I. will be making to Courtaulds ordinary stockholders who accepted the recent I.C.I. offer for their stock.

This payment represents any further dividend to be declared by Courtaulds in respect of its year to 31 March 1962, not exceeding 1s 3d, less tax, per ordinary stock unit.

The Courtaulds directors have said they are satisfied that they will be able properly to recommend to the ordinary stockholders at the annual general meeting near the end of July, the payment of a final dividend of 1s 9d per £1 unit.

### Tennant Trading

C. Tennant and Sons have formed a new wholly-owned company, Tennant Trading Ltd., to take over all trading activities as from 1 May. Directors of Tennant Trading are Lord Glenconner (chairman), Mr. C. Tennant (managing), Mr. J. Tennant, Sir Charles Denman, Mr. R. Ford, and Mr. R. D. Munro (overseas director).

### Woodall-Duckham

Group profit of Woodall-Duckham, contractors and engineers, for 1961 was £762,526 (£1,413,128). Tax took £336,800 (£690,119) and group net profit was £420,526 (£723,009). Profit attributable to the parent company was £435,651 (£696,255). Final dividend of .16%, makes 21%—as forecast (against an equivalent of 20.6%). Work carried out in 1961 was valued at £14.5 million (£13.25 million). Orders received were worth £14 million.

### American Enka

American Enka Corp., the U.S. subsidiary of the Algemene Kunstzijde Unie NV,

- B.P. group income falls by £2.8 million
- Better profits for Canadian Chemical
- Du Pont prepare to divest G.M. holdings
- Merck seek quotes in London, Amsterdam

reports for the first quarter of 1962 net profit of \$1.52 (46 cents) per share. The quarterly dividend is to be of 40 (30) cents per share. American Enka, in which the A.K.U. hold 56%, will have brought nylon production up to 40 million lb. annually by July of this year it is stated, following an expansion scheme.

### A.N.I.C.

A.N.I.C., Milan, which, as reported on page 699 in the last issue, had a 1961 net profit of 3,246 million lire, will pay this year a 3,240 million lire dividend (1,890 million lire). The annual shareholders meeting approved a nominally unchanged dividend of 90 lire.

### Canadian Chemical

A fairly substantial improvement in sales and profits of the Canadian Chemical Co. Ltd., for the current year compared with 1961, was forecast by Mr. Robinson Ord, president, at the recent annual meeting. Net sales so far this year have been an all-time high. Sales of petrochemicals and yarns and fibres so far this year have been substantially higher than in the same period of 1961.

### Dow Chemical

Total sales of Dow Chemical Company in the three months ended 28 February amounted to \$210,849,820 compared with \$182,484,640 in the corresponding quarter of 1961, but earnings were unchanged at 42 cents per share. For the nine months ended 28 February Dow's total sales were \$650,357,179 (\$604,804,306) and earnings \$1.52 a share (\$1.60).

### Eastman Kodak

Consolidated U.S. sales of Eastman Kodak for the first quarter of 1962 rose to \$218,699,377 (\$193,883,412) and earnings were 68 cents (56 cents). First quarter results set a new record.

### Du Pont

The U.S. Attorney General is not to appeal against the Court's decision that Du Pont and their associated company Christiana Securities, should divest themselves of their holdings in General Motors. The ruling is said to mark a landmark in anti-trust enforcement.

Members of the Du Pont family would have to sell the 8.6 million shares that they would receive as part of the divestiture and the 3 million shares held by Du Pont executives would also have to be sold. Du Pont are now preparing for divestiture, which is due to start by

30 July and to be completed by the end of February 1965.

Du Pont reached a new record for quarterly sales for the first quarter of 1962, at \$579 million (\$513 million). Total earnings, including General Motor dividends, were \$2.23 (\$1.85).

### Kali Chemie AG

Kali Chemie AG, of Hanover, recommend a 1961 dividend of 12% (same).

### Merck

The Common stock of Merck has been listed on the Amsterdam Stock Exchange. The move was said to be the first step in the programme to expand world-wide ownership of the company. A listing on the Paris Bourse is expected in the near future and possibly on other European exchanges.

Merck are also considering applying for a quotation on the London Stock Exchange.

### Monsanto

Monsanto Chemical has begun the necessary legal steps to merge Chemstrand Corporation into Monsanto. Chemstrand, a wholly-owned subsidiary, will become Chemstrand Company, a division of Monsanto.

### National Distillers and Chemical

First quarter earnings of National Distillers and Chemical were 46 cents (37).

### Olin Mathieson

First quarter sales and other income of Olin Mathieson Chemical rose to \$171,694,000 (\$156,968,000) and earnings 50 cents (44 cents) a share.

### Rhone-Poulenc

Net profit of Rhône-Poulenc in 1961 was F.79,680,000 and a dividend of F.4.96 per share has been declared. No comparison with 1960 is possible due to the structural alteration within the concern. In the chemicals and pharmaceuticals section of the company's activities sales rose over last year by 6.2% and export sales alone by 7.8%.

### Union Carbide

First quarter net sales of Union Carbide were \$405,624,000 (\$364,299,000) with earnings \$1.25 (\$1.12) a share.

### INCREASE OF CAPITAL

PROGIL-BAYER-UGINE, Paris, have increased their capital from NF.15 million to NF.20 million.

NIPA LABORATORIES LTD., manufacturers in antiseptics, etc., 1 Crutched Friars, London E.C.3. Increased by £15,000 beyond the registered capital of £5,000.

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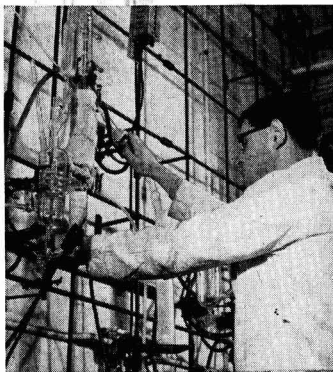
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# BRITISH CHEMICAL PRICES

## GENERAL CHEMICALS

**Acetic Acid.** 10-ton quantities, 80% tech. in bulk £73 per ton; in casks, £86 per ton; 80% pure in bulk, £79; in casks, £90; glacial, 98/100% in bulk, £88; in drums, £95.

**Acetic Anhydride.** In bulk, £108; drums, £115; carboys, £130; demijohns, £130.

**Alum.** Ground, f.o.r., about £25.

**MANCHESTER:** Ground, £25.

**Aluminium Sulphate.** Ex-works, d/d, £15 10s to £18.

**MANCHESTER:** £16 to £18.

**Ammonia, Anhydrous.** Per lb., 1s 9d-2s 3d.

**Ammonium Chloride.** Per ton lot, in non-ret. pack, £33 2s 6d.

**Ammonium Nitrate.** D/d, 4-ton lots, £37 10s.

**Ammonium Persulphate.** Per cwt., in 1-cwt. lots, d/d, £6 13s 6d; per ton, in min. 1-ton lots, d/d, £123 10s.

**Ammonium Phosphate.** MAP., £106 per ton; DAP, £100 10s, per ton, d/d.

**Antimony Sulphide.** Per lb., d/d UK in min. 1-ton lots; crimson, 5s 8d d/d to 6s 2d; golden, 3s 11d d/d per lb. to 5s 4d d/d.

**Arsenic.** Ex-store, £45 to £50.

**Barium Carbonate.** Precip., d/d, 4-ton lots or more, bag packing, £37 10s. per ton.

**Barium Chloride.** 2-ton lots, £45.

**Barium Sulphate [Dry Blanc Fixe].** Precip. 2-ton lots, d/d, £36.

**Bleaching Powder.** Ret. casks, c.p. station, in 4-ton lots, £30 7s 6d.

**Borax.** Ton lots, in hessian bags, c.p. Tech. anhydrous, £60 gran., £45 10s; crystal £49; powder, £50; extra fine powder, £51; BP, gran., £54 10s; crystal, £58; powder, £59; extra fine powder, £60. £1 cheaper in 5-ply paper bags.

**Boric Acid.** Ton lots, in hessian sacks, c.p. Comm., gran., £75; crystal, £85; powder, £82 10s extra fine powder, £84 10s; BP gran., £88; crystal, £97; powder, £94 10s; extra fine powder, £96 10s. £1 cheaper in paper bags.

**Calcium Chloride.** Ton lots, in non-ret. pack; solid and flake, about £15.

**Chlorine, Liquid.** In ret. 16-17 cwt. drums d/d in 3-drum lots, £41.

**Chromic Acid.** In 1-ton lots, per lb., 2s 2½d.

**Chromium Sulphate, Basic.** Powder, d/d, 1 ton lots £77.

**Citric Acid—Granular.** In kegs, 1-4 cwt. lots, per cwt., £7 7s; 5-19 cwt. lots, per cwt., £7 6s; 1-ton lots, per cwt., £7 5s; packed in paper bags, 1-4 cwt. lots, per cwt., £7; 5-19 cwt. lots, per cwt., £6 19s; 1-ton lots, per cwt., £6 18s.

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

**Copper Carbonate.** Per lb., 3s 6d.

**Copper Sulphate.** £79 per ton less 2% f.o.b. Liverpool.

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

**Formaldehyde.** In casks, d/d, £40.

**Formic Acid.** 85%, in 4-ton lots, c.p., £91.

**Glycerine.** Chem. pure, double distilled 1.2627 s.g., per cwt., in 5-cwt. drums for annual purchases of over 5-ton lots and under 25 tons, £9 12s. Refined technical grade industrial, 5s per cwt. less than chem. pure.

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

**Hydrofluoric Acid.** 60%, per lb., 1s 6d-1s 10d.

**Hydrogen Peroxide.** Carboys extra and ret. 27.5% wt., £115; 35% wt., d/d, £138.

**These prices are checked with the manufacturers, but in many cases there are variations according to quality, quantity, place of delivery, etc. Abbreviations: d/d, delivered; c.p., carriage paid; ret., returnable; non-ret. pack., non-returnable packaging; tech., technical; comm., commercial; gran., granular.**

**All prices per ton unless otherwise stated**

**Iodine.** Resublimed BP, under 1 cwt., per lb., 11s 6d; for 1-cwt. lots, per lb., 11s 3d.

**Iodoform.** Under 1 cwt., per lb., 24s 1d; for 1-cwt. lots, per lb., 23s 5d; crystals, 3s more.

**Lactic Acid.** Edible, d/d, 50% by wt., per lb., 16½d; 80% by wt., 26½d; C.P., 50% by wt., per lb., 14½d; 80% by wt., 23d; dark ex-works, 44% by wt., per lb. 9d. 1-ton lots, loaned containers.

**Lead Acetate.** White, about £154.

**Lead Nitrate.** 1-ton lots, about £135.

**Lead, Red.** Bases prices: 15-cwt. drum lots, Genuine dry red, £97 per ton; orange lead, £109 per ton; Ground in oil: red, £119; orange, £131.

**Lead, White.** Bases prices: in 5-cwt. drums, per ton for 2-ton lots, Dry English £109 15s; Ground in oil, £130 5s.

**Lime Acetate.** Brown, ton lots, d/d, £40; grey, 80-82% ton lots, d/d, £45.

**Litharge.** In 5-cwt. drum lots, £99.

**Magnesite.** Calcined, in bags, ex-works, about £21.

**Magnesium Carbonate.** Light, comm., d/d, 2-ton lots, £84 10s; under 2 tons, £97.

**Magnesium Chloride.** Solid (ex-wharf), £20 6s per ton.

**Magnesium Oxide.** Light, comm., d/d, under 1-ton lots, £245.

**Magnesium Sulphate.** Crystals, £15, ex-works.

**Mercuric Chloride.** Tech. powder, per lb., for 1-ton lots, in 28-lb. parcels, 19s 5-cwt. lots, in 28-lb. parcels, 19s 6d; 1-cwt. lots, in 28-lb. parcels, 19s 9d.

**Mercuric Sulphide, Red.** Per lb. for 5-cwt. lots in 28-lb. parcels, £1 10s 6d; 1-cwt. lots, in 28-lb. parcels, £1 11s.

**Nickel Sulphate.** D/d, buyers UK, nominal, £170.

**Nitric Acid.** 80% Tw., £35 2s.

**Oxalic Acid.** Home manufacture, min. 4-ton lots, in 56 lb. paper bags, c.p., about £125-£130.

**Phosphoric Acid.** TPA 1,700 ton lots, c.p., £103; BP (s.g. 1,750) ½-ton lots, c.p., per lb., 1s 4d.

**Potash, Caustic.** Solid, 1-ton lots, £95 10s; liquid, £36 15s.

**Potassium Carbonate.** Calcined, 96/98%, 1-ton lots, ex-store, about £76.

**Potassium Chloride.** Industrial, 96%, 1-ton lots, about £24.

**Potassium Dichromate.** Gran., 1-ton lots, £131 16s. 8d. d/d.

**Potassium Iodide.** BP, under 1 cwt, per lb., 9s 0d., per lb. for 1-cwt. lots, 8s 9d.

**Potassium Nitrate.** 4-ton lots, in non-ret. pack, c.p., £63 10s.

**Potassium Permanganate.** BP, 1-cwt. lots, per lb., 2s 0½d; 3-cwt. lots, per lb., 1s 11½d; 5-cwt. lots, per lb., 1s 11½d; 1-ton lots, per lb., 1s 11d; 5-ton lots, per lb., 1s 10½d. Tech., 1-ton lots in 1-cwt. drums, per cwt., £10 3s; 5-cwt. in 1-cwt. drums, per cwt., £10 5s; 1-cwt. lots, £10 14s.

**Propylene Oxide.** Bulk lots, d/d, £162.

**Salammoniac.** Ton lot, in non-ret. pack, £47 10s.

**Salicylic Acid.** MANCHESTER: Tech., d/d, per lb., 2s 6d, cwt. lots.

**Soda Ash.** 58% ex-depot or d/d, London station, 1-ton lots, about £16 11s 6d.

**Sodium Acetate.** Comm. crystals, d/d, £75 8s.

**Soda, Caustic.** Solid 76/77%; spot, d/d 1-ton lots, £33 16s 6d.

**Sodium Bicarbonate.** Ton lot, in non-ret. pack, £12 10s.

**Sodium Bisulphite.** Powder, 60/62%, d/d 2-ton lots for home trade, £45.

**Sodium Carbonate Monohydrate.** Ton lot, in non-ret. pack, c.p., £64.

**Sodium Chlorate.** 1-cwt. drums, c.p. station, in 5-ton lots, about £88 per ton.

**Sodium Cyanide.** 96/98%, ton lot in 1-cwt. drums, £126.

**Sodium Dichromate.** Gran. Crystals 1-ton lots, £109 13s. 4d., anhydrous, 1-ton lots, £126. All lots delivered.

**Sodium Fluoride.** D/d, 1-ton lots and over, per cwt., £5 4s 6d; 1-cwt. lots, per cwt., £5 15s.

**Sodium Hyposulphite.** Pea crystals, £38; comm., 1-ton lots, c.p., £34 15s.

**Sodium Iodide.** BP, under 56 lb. per lb., 11s 3d; 56 lb. and over, 11s 0d.

**Sodium Lactate.** Edible, 70%, per ton, £150, d/d free drums, 1-ton lots.

**Sodium Metaphosphate.** Flaked, paper sacks, £136.

**Sodium Metasilicate.** (Spot prices) D/d UK in 1-ton lots, 1-cwt. free paper bags, £30.

**Sodium Nitrate.** Chilean refined gran. over 98%, 6-ton lots, d/d, c.p., per ton, £29.

**Sodium Nitrite.** 4-ton lots, £32.

**Sodium Perborate.** (10% available oxygen) in 1-cwt. free kegs, 1-ton lots, £129 10s; in 1-cwt. lots, £139 5s.

**Sodium Percarbonate.** 12½% available oxygen, in 1-cwt. kegs, £170 15s.

**Sodium Phosphate.** D/d, ton lots: disodium, crystalline, £40 10s, anhydrous, £89; tri-sodium, crystalline, £39 10s, anhydrous, £87.

**Sodium Silicate.** (Spot prices) 75-84° Tw. Lancs and Ches, 6-ton lots, d/d station in loaned drums, £13 10s; Dorset, Somerset and Devon, per ton extra, £3 5s; Scotland and S. Wales, extra, £2 17s 6d. Elsewhere in England, not Cornwall, extra, £1.

**Sodium Sulphate [Desiccated Glauber's Salt].** D/d in bags, about £19.

**Sodium Sulphate [Glauber's Salt].** D/d, up to £14.

**Sodium Sulphate [Salt Cake].** Unground, d/d station in bulk, £10.

**MANCHESTER:** d/d station, £10 10s.

**Sodium Sulphide.** 60/62%, spot, d/d, in drums in 1-ton lots, solid, £39 2s 6d; broken, £40 2s 6d. Flakes, £41 12s 6d, crystals, £30.

**Sodium Sulphite.** Anhydrous, £71 10s; comm., d/d station in bags, £27-£28 10s.

**Sulphur.** 4 tons or more, ground, according to fineness, £20-£22.

**Sulphuric Acid.** Net, naked at works, 168° Tw. according to quality, £11 10s—£12 10s per ton; 140° Tw., arsenic free, £9; 140° Tw., arsenious, £8.

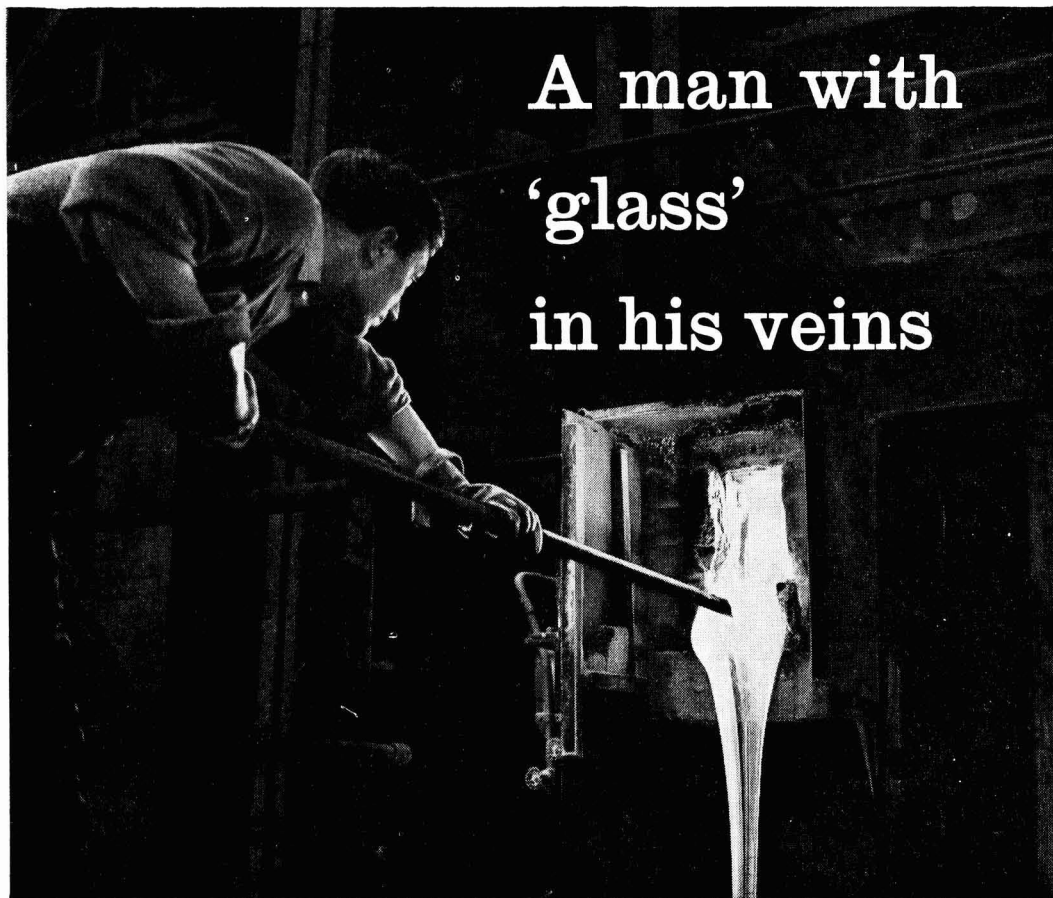
**Tartaric Acid—Powder and Granular.** Per cwt.: 10 cwt. or more, in kegs, 286s; in bags, 278s per cwt.

**Titanium Oxide.** Standard grade comm., rutile structure, £178; standard grade comm., anatase structure, £163.

**Zinc Oxide.** Per ton: white seal, £90; green seal, £88; red seal, £85.

## SOLVENTS AND PLASTICISERS

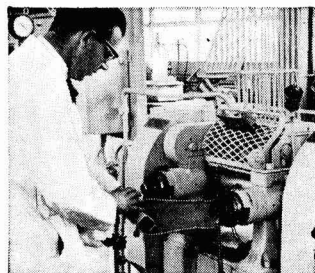
**Acetone.** All d/d. In 5-gal. drums, £119; in 10-gal. drums, £109; in 40-45 gal. drums, under 1 ton, £84; 1-5 tons, £79;



# A man with 'glass' in his veins

Alfred Walkett is one of several men in charge of the glass furnaces at Crosfields . . . furnaces that, every week, working day and night, fuse together over a thousand tons of sand and soda ash into a high-grade glass. Alfred's skill lies in keeping the quality of this glass consistent—for this is the basic material from which specialists like Arthur Lennox (right) help to evolve new fillers for rubbers, binding agents for TV tube coatings, catalysts for Britain's petrol. . . .

Impressive though the list is, Crosfields are never content. In their new £750,000 Technical Centre research continues unceasingly to find new ways of using silicates . . . to promote new production economies in a wide range of industries. Maybe yours?



Crosfield brands include: Pyramid silicate adhesive. Solgon and Trimetso industrial alkaline detergents. Sorbsil desiccant. Nicat non-pyrophoric catalyst. Gasil micronised silica gels. Microcal calcium silicate. Alusil aluminium silicate. Neosyl precipitated silica.



*Largest Manufacturers of Silicates in the United Kingdom*

**JOSEPH CROSFIELD & SONS LIMITED**

WARRINGTON, LANCASHIRE. TELEPHONE: WARRINGTON 31211

5-10 tons, £77; 10 tons and up, £75; in 500-gal. tank wagons, £74. In bulk minimum 2,500 gal. £70 per ton.

**Butyl Acetate BSS.** 10-ton lots, £155.

**n-Butyl Alcohol BSS.** 10 tons, in drums, d/d, £137 10s.

**sec-Butyl Alcohol.** All d/d. In 5-gal. drums, £153; in 10-gal. drums, £148 in 40-45 gal. drums, under 1 ton, £123; 1-5 tons, £118; 5-10 tons, £116; 10 tons and up, £114; in 400-gal. tank wagons, £108.

**tert-Butyl Alcohol.** 5-gal. drums, £197; 40/45-gal. drums: 1 ton, £175 10s; 1-5 tons, £162; 5-10 tons, £160; 10 tons and up, £158.

**Diacetone Alcohol.** Small lots: 5-gal. drums, £178; 10-gal. drums, £168. 40/45-gal. drums: under 1 ton, £148; 1-5 tons, £143; 5-10 tons, £141; 10 tons and over, £139, in 400-gal. tank wagons, £133.

**Dibutyl Phthalate.** In drums, 10 tons, d/d per ton, £194; 45-gal. 1-4 drums, £200.

**Diethyl Phthalate.** In drums, 10 tons, per ton, £183; 45-gal. 1-4 drums, £189.

**Dimethyl Phthalate.** In drums, 10 tons, per ton, d/d, £173; 45-gal. 1-4 drums, £179.

**Diethyl Phthalate.** In drums, 10 tons, d/d, per ton, £188; 45-gal. 1-4 drums, £194.

**Ether BSS.** 1-ton lots, drums extra, per lb., 1s 11d.

**Ethyl Acetate.** 10-ton lots, d/d, £130.

**Ethyl Alcohol Fermentation grade (PBF 66 o.p.).** Over 300,000 p. gal., 3s 10½d; d/d in tankers, 2,500-10,000 p. gal. per p. gal., 4s 0½d. D/d in 40/45-gal. drums, p.p.g. extra, 2d.

**Absolute alcohol (74.5 o.p.),** p.p.g. extra, 2d.

**Methanol.** Pure synthetic, d/d, £46.

**Methylated Spirit.** Industrial 66° o.p.: 500-gal. and up, d/d in tankers, per gal., 5s 7½d; 100-499 gal. in drums, d/d per gal., 6s 0½d-6s 2½d. Pyridinised 66° o.p.: 500 gal. and up, in tankers, d/d, per gal., 5s 11d; 100-499 gal. in drums, d/d, per gal., 6s 4d-6s 6d.

**Methyl Ethyl Ketone.** All d/d in 40/45-gal. drums, under 1 ton, £141; 1-5 tons, £136; 5-10 tons, £134; 10 tons and up, £132; in 400-gal. tank wagons, £126.

**Methyl isoButyl Carbinol.** All d/d. In 5-gal. drums, £194; in 10-gal. drums, £184; 40-45 gal. drums, less than 1 ton, £164; 1-9 tons, £159; 10 tons and over, £155; in 400-gal. tank wagons, £149.

**Methyl isoButyl Ketone.** All d/d. In 5-gal. drums, £194; in 10-gal. drums, £184; in 40/45-gal. drums, under 1 ton, £164; 1-9 tons, £159; 5-10 tons, £160; 10 tons and up, £155; in 400-gal. tank wagons, £149.

**soPropyl Acetate.** 10 tons, d/d, 45-gal. drums £125.

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

## RUBBER CHEMICALS

**Carbon Disulphide.** According to quality, £61-£67.

**Carbon Black.** GPF: Ex-store, Swansea. Min. 3-ton lots, one delivery, 6½d per lb.; min. 1-ton lots and up to 3-tons, one delivery 6½d per lb.; ex-store, Manchester, London and Glasgow, 7½d per lb. HAF: ex-store, Swansea; Min. 3-ton lots, one delivery, 7½d per lb.; min. 1-ton lots and up to 3-tons, one delivery, 7½d per lb. Ex-store Manchester, London and Glasgow, 8½d per lb. ISAF: Ex-store Swansea, min. 3-ton lots in one delivery, 9½d per lb., min. 1-ton lots and

up to 3-tons in one delivery, 9½d per lb. Ex-store Manchester, London and Glasgow, 10½d per lb.

**Carbon Tetrachloride.** Ton lots, £83 15s.

**India-Rubber Substitutes.** White, per lb. 1s 4½d to 1s 7d; dark, d/d, per lb., 1s 0½d to 1s 4d.

**Lithopone.** 30%, about £57 10s for 5-ton lots.

**Mineral Black.** £7 10s-£10.

**Sulphur Chloride.** British, about £50.

**Vegetable Lamp Black.** 2-ton lots, £64 8s.

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

## COAL TAR PRODUCTS

**Benzole.** Per gal., min. 200 gal., d/d in bulk, 90's, 5s 3d; pure, 5s 7d.

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

**MANCHESTER:** Per gal., 1s 3d-1s 8d.

**Cresylic Acid.** Pale 99/100%, per gal., 7s 9d D/d UK in bulk: Pale ADF, per imperial gallon f.o.b. UK, 8s; per US gallon, c.i.f. NY, 103.50 cents freight equalised.

**Naphtha.** Solvent, 90/160°, per gal., 4s 11d heavy, 90/190°, for bulk 1,000-gal. lots, d/d, per gal., 3s 10d. Drums extra; higher prices for smaller lots.

**Naphthalene.** Crude, 4-ton lots, in buyers' bags, nominal, according to m.p.: £22-£30; hot pressed, bulk, ex-works, £42; refined crystals, d/d min. 4-ton lots, £65-£68.

**Phenol.** Crystals, d/d bulk, per lb. 1s; 40/50-gal. ret. drums extra, per lb. ½d.

**Pitch.** Medium soft, home trade, f.o.r. suppliers' works, £10 10s; export trade, f.o.b. suppliers' port, about £12.

**Pyridine.** 90/160, per gal., 18s about.

**Toluol.** Pure, per gal., 4s 11d; 90's 2,000 gal. in bulk, per gal., 4s 8d.

**MANCHESTER:** Pure, naked, per gal., 5s 6d.

**Xylole.** According to grade, in 1,000-gal. lots, d/d London area in bulk, per gal., 5s 3d-5s 5d.

## INTERMEDIATES AND DYES

(Prices Normal)

**m-Cresol** 98/100%. 10 cwt. lots d/d, per lb., 4s 9d.

**o-Cresol** 30/31°C. D/d, per lb., 1s.

**p-Cresol** 34/35°C. 10 cwt. lots d/d, per lb., 5s.

**Dichloraniline.** Per lb., 4s 6d.

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

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

**p-Nitraniline.** Per lb., 5s 1d.

**Nitrobenzene.** Spot, 90 gal. drums (drums extra), 1-ton lots, d/d, per lb., 11d.

**Nitronaphthalene.** Per lb., 2s 5½d.

**o-Toluidine.** 8-10 cwt. drums (drums extra), per lb., 1s 10d.

**p-Toluidine.** In drums, per lb., 3s 6d.

**Dimethylaniline.** Drums extra, c.p., per lb. 3s 2d.

## Nicholas to market new anthelmintic

A NEW anthelmintic, aimed at the more effective control of problem worms in sheep, will soon be available in the U.K. Following extensive trials in Australia and the U.K., A. and V Nicholas have introduced Halin, a new organic phosphate compound, which is claimed to be four times more active weight for weight than phenothiazine.

The active ingredient of Halin is Ruelene, a drug developed and patented by the Dow Chemical Co. Ltd.

## New fire-extinguishing liquid from I.C.I.

A NEW fire-fighting liquid for use against electrical fires and fires of inflammable liquids is now available from I.C.I. The material, known as BCF (bromochlorodifluoromethane), acts as a blanket of dense gas which will not support combustion, but its more important action is to inhibit the reactions taking place in the flames.

BCF has a very high efficiency combined with a low toxicity. Its boiling point of 25°C is low enough to ensure rapid volatilisation in use, but high enough to give only a moderate vapour pressure at normal temperatures.

Fire-fighting equipment for use with BCF is already being developed by manufacturers in the U.K., including the Graviner Manufacturing Co., the Pyrene Co. and the National Fire Protection Co.

BCF is cheaper than fluorine compounds which have been suggested as fire-fighting liquids. At present it is more expensive than well established materials such as chlorobromomethane and methyl bromide, but I.C.I. claim that its higher cost is offset by its superior properties.

## Resin handling exhibition

AN exhibition, described as the first of its kind, illustrating equipment available for handling epoxy resins, is to be held by CIBA (A.R.L.) Ltd., at their factory at Duxford, Cambridge, on 6 and 7 June.

The exhibition, which is being organised with the co-operation of various manufacturers, will include equipment for metering, mixing, dispensing, casting and curing Araldite resins, and will range from the simplest of applicators to fully automated vacuum casting plants.

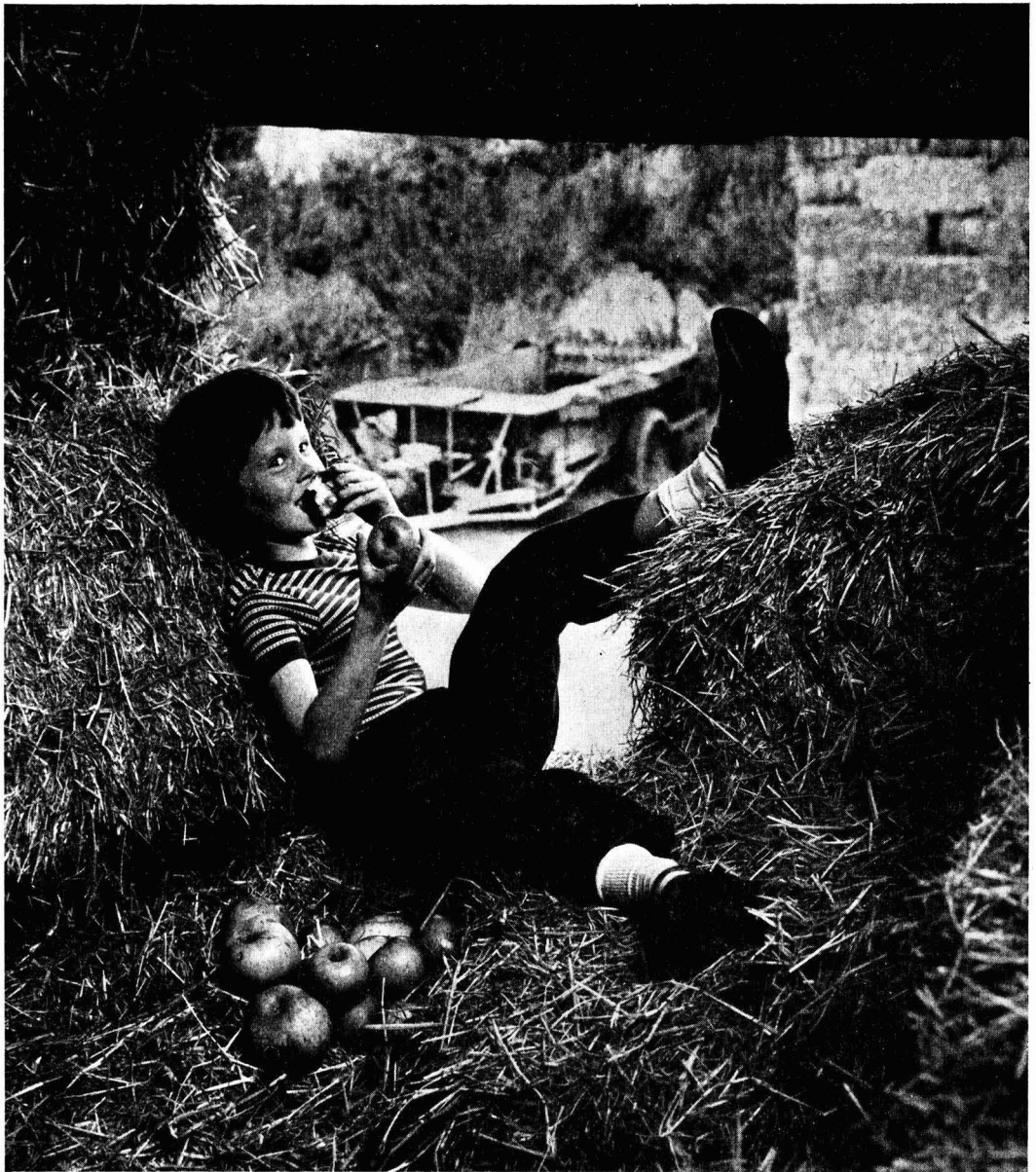
Tickets and further information can be obtained from CIBA (A.R.L.) Ltd., Duxford, Cambridge.

## 1962 'British Plastics Year Book' available

Now in its 32nd year of publication, the 'British Plastics Year Book 1962', published recently by Iliffe Books Ltd., Dorset House, Stamford Street, London S.E.1, price 50s net, is a comprehensive classified guide, valuable to all connected with plastics and to manufacturers and users of machinery and equipment. Of 648 pages, it is divided into 11 sections, including addresses of over 7,000 firms in the U.K. and overseas. Contents include technical data and glossary, new company registrations, a 'Who's Who' and lists of companies giving basic services from moulding and extruding to welding and metallising.

## Will

**Mr. Kenneth Clarkson Allen**, for many years managing director and later chairman of Stafford Allen and Sons, Ltd., who died on 2 February, aged 83, left £105,602 (duty paid £52,902).



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# TRADE NOTES

## Nitrile rubber accelerator

Robac Gamma, a room temperature, non-discolouring accelerator for natural or nitrile rubber, and a low temperature accelerator in SBR, is the subject of a technical bulletin available from Robinson Brothers Ltd., Ryders Green, West Bromwich.

## Anchor carbon black

Prices of the GPF, HAF and ISAF grades of carbon black of the Anchor Chemical Co. Ltd., Clayton, Manchester 11, have been reduced all round by 4d per lb. as from 9 April.

## Epok water soluble resins

A new booklet on Epok water soluble resins is available from British Resin Products Ltd. The booklet, which contains the latest information, includes a number of typical formulations together with information which paint manufacturers and users will find particularly useful. Copies of the publication (T.B. No. E7) are available from the Publicity and Information Department, Devonshire House, Piccadilly, London W.1.

## Incandescent Ltd.

Incandescent Ltd., Cornwall Road, Smethwick, Staffs, has been formed to take over certain of the trading activities of their parent company the Incandescent Heat Co. Ltd. They announce they will accept all contractual obligations affecting the completion of contracts in hand and uncompleted at 31 March, 1962 (except those of the incandite foundries division) and responsibility for payment to suppliers for goods ordered by Incandescent Heat Co. Ltd. to be delivered after March, 1962.

## Polyorc BH fittings

Additions to their wide range of fittings in Polyorc BH high impact p.v.c. are announced by Yorkshire Imperial Metals Ltd., P.O. Box No. 166, Leeds. Full-face socket flanges are now offered in all tube sizes from ½ in. to 2 in., T-S socket stub flange in the 6 in. size, and the range of tube sizes has been extended. Details are in a recently revised illustrated catalogue, and a new price list is also available.

## Vinyl technical reports

Three new technical service reports—Nos. T-14, T-15 and T-16—issued by Vinyl Products Ltd., Butter Hill, Carchalton, Surrey, replace technical service report No. T-13 and deal with stoving finishes based on Vinacryl 3001, previously known as development product R3075. This new acrylic copolymer solution which cross-links with melamine formaldehyde, urea formaldehyde and epoxy resins, gives finishes with widely differing properties. Report No. T-14 describes conventional acrylic stoving systems. No. T-15 deals with two-pack

systems which cross-link at temperatures as low as 120°C, and hammer finishes based on the two alternative systems are described in No. T-16.

## Contraves viscometers

Heathway Machine Sales Ltd., Uxbridge Road, Hillingdon, Middx., have received from Contraves A.G., of Zurich, exclusive selling rights of their scientific instruments and industrial control equipment in the field of rheology.

## B.I.C.C. new branch

A new Greenwich branch was opened on 2 April by British Insulated Callender's Cables Ltd., since when the establishments at Chessington, Surrey, and Hayes, Middx, formerly operating as depots to London branch, have been reorganised as separate branches, con-

tinuing at their existing addresses. The new Greenwich branch is at Blackwall Lane, Greenwich, London S.E.10 (phone: Greenwich 7011).

## Flexibox seal rings

Seal rings with increased heat transfer areas to ensure low operating temperatures, have been manufactured for many years by Flexibox Ltd., Nash Road, Trafford Park, Manchester 17. Seal rings with such a feature are incorporated in their seal designs whenever conditions call for their use, the company announce.

## Paint year book

The second edition of their year book issued by the Paint, Oil and Colour Journal, 83-86 Farringdon Street, London E.C.4, is a complete guide to suppliers of products and equipment used in the paint, printing ink and allied industries. The raw material sections have been revised and there are also new sections covering plant and machinery, testing equipment and containers.

## Market Reports

### DUTY RISE AFFECTS SOLVENT PRICES

**LONDON** Conditions on the industrial chemicals market have been rather more active than of late, but the volume of new business on home account has been moderate. The routine soda products have been in fair request and there has been a steady call for hydrogen peroxide, formaldehyde, borax and boric acid. Prices generally are steady. The flow of inquiry for export remains at about the recent level, covering a wide range of chemicals. Business in fertilisers has been quietly steady with a good movement of supplies against existing commitments. With supplies ample for current requirements there has been no feature in the coal tar products market. Prices are at late rates with solvents slightly higher due to the increase in excise duty.

**MANCHESTER** Trading conditions on the Manchester market for chemical products are now back into their stride again after the holiday interruption. A fair number of enquiries have been cir-

culating and order book additions, mainly for prompt and early deliveries, have been on quietly steady lines. The majority of industrial users are well covered for requirements up to the end of June and beyond and, on the whole, the commitments are being drawn against reasonably well. Prices have held pretty well throughout the range. Among the coal tar products, creosote oil, carbolic and cresylic acids, and most of the solvents are meeting with a quietly steady demand.

**SCOTLAND** The past week has again been one of continued activity with a good volume of movement in general chemicals for the home market. Quantities have been very well maintained and the off-take against contracts remained steady. There has been some increased activity in regard to the overseas market both in enquiries received and resultant business. Considerable interest is still being shown in fertilisers.

## Chemical maker's road safety scheme



Price's (Bromborough) Ltd. are encouraging heavy vehicle drivers delivering oleochemicals to pass a proficiency test. Driver R. Parker, who on passing received £10 and a badge for his lorry, is being congratulated by Messrs. D. C. Grant (transport manager) and W. Challenger (traffic supervisor)





*quality has many facets* . . . Important as it is, quality of product is only one facet of that many-sided gem called "satisfaction." Integrity, reliability, cooperation, the reputation and service of a supplier are others. Tenneco aromatics are backed by the research and resources of a great industrial leader—Tennessee Gas Transmission Company. They're dependable . . . meet or exceed the most exacting specifications. And . . . purchasing executives please note . . . they're shipped on time . . . as promised . . . to *your* delivery date. That applies to all our petrochemicals: benzene, toluene, xylene, ortho-xylene, ethylbenzene, meta-para xylene concentrate, solvents for surface coatings and agricultural chemicals. Need any? Let us show you all sides of our service. Contact Tenneco.



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# NEW PATENTS

By permission of the Controller, H.M. Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 5s including postage; annual subscription £12 10s.

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

## AMENDED SPECIFICATIONS Open to public inspection 23 May

Reconstitutable, aqueous polyvinyl acetate emulsion powders. Shawinigan Resins Corporation. 753 173  
Polymerisation of olefins. Imperial Chemical Industries Ltd. 824 369

## ACCEPTANCES Open to public inspection 6 June

Silver chloride, silver sulphide infrared transmitting filters. Eastman Kodak Co. 898 222, 898 231  
Process for the manufacture of metallisable 4-hydroxy - 5 - carboxyphenyl - 2,2' - dihydroxy-azo-dyestuffs. Durand & Huguenin AG. 898 353  
Thixotropic agents and compositions containing them. Olin Mathieson Chemical Corporation. 897 993, 897 994  
Purification of benzene. Newton, Chambers & Co. Ltd. 897 981  
Production of 51-Nucleotides. Yamasa Shoyu Kabushiki Kaisha. 898 334  
Process for the manufacture of hardened artificial resin materials and compositions thereof. Ciba Ltd. 897 985  
Cyclopentanophenanthrene compounds and process for the production thereof. Syntex SA. 897 986  
Process for preparing hydrogen and carbon monoxide from mixtures of hydrocarbons or gases containing them and steam. Berkhuisen, E. H., and Kempen, H. W. J. 898 338  
Process and apparatus for the continuous production of a polyhexamethylene adipamide. Vereinigte Glanzstoff-Fabriken AG. 898 339  
Process for the production of a zeolite. Farbenfabriken Bayer AG. 898 457  
Production of metal chlorides. Columbia-Southern Chemical Corporation. 898 365  
Production of interpolymers. Imperial Chemical Industries Ltd. 898 330  
Methods of producing purified silicon. Siemens & Halske AG. 898 342  
Gasoline composition. Ethyl Corporation. [Addition to 781 065.] 898 343  
Aminoplastalkyl coating compositions and substituted melamine-formaldehyde condensates for use therein. Monsanto Chemical Co. 898 345  
Preparation of alpha-olefin copolymers. Montecatini and Ziegler, K. 898 261  
Production of sulphonilamidiazines. American Cyanamid Co. 898 346  
Polyesters. Monsanto Chemical Co. 898 301  
Process for removing cations and anions from an aqueous solution. Bayer 898 458  
Chlorosulphonation and chlorination of alpha-olefin polymers and copolymers. Montecatini 898 263  
Phenolic compounds. Ethyl Corporation. 898 028  
Monomeric, polymerisable, ultra-violet light-screening esters and amides, their polymerisation and use. Ciba Ltd. 898 065  
Process for the polydimersation of polyphosphates and products thus produced. South African Iron & Steel Industrial Corporation Ltd. 898 303  
Emulsion polymerisation processes and products. Compagnie Generale Des Etablissements Michelin, Raison Sociale: Robert Piseux et Cie. 898 402  
Therapeutically-active substituted alkylamines. Pfizer Ltd. 898 304  
Process for the production of pigment preparations. Sandoz Ltd. [Addition to 895 751.] 898 367

Nuclearly substituted anilines and nitrolines and their preparation. Sterling Drug Inc. 898 045  
Production of boron carbide. United States Borax & Chemical Corporation. 898 403  
Flexible polyurethane foam. Dunlop Rubber Co. Ltd. 898 271  
Bleaching compositions. Olin Mathieson Chemical Corporation. 898 305  
Polymerisation of epoxy compounds. Hercules Powder Co. 898 306  
Method of preparing disubstituted chlorinated benzene derivatives. Soc. D'Electrochimie, D'Electrometallurgie et des Acrieries Electriques D'Ugine. 898 307  
Process for the production of neutral alkali metal salts of isomeric phthalic acids. Ratusky, J. and Novosad, J. 898 048  
Process for the manufacture of hydrogen peroxide. Wacker-Chemie GmbH. 898 308  
Platinum catalysts and process for preparing same. American Cyanamid Co. 898 395  
Process for production of polymers and copolymers of propylene. Du Pont de Nemours & Co., E. I. 898 053  
Tetrafluoroethylene telomers. Imperial Chemical Industries Ltd. 898 309  
Preparation of steroid derivatives. Glaxo Laboratories Ltd. 898 093  
Amino acid derivatives. Frosst & Co., Charles E. 898 101  
Separation of hydrocarbon mixtures. British Petroleum Co. Ltd., Yeo, A. A. and Hicks, C. L. 898 058 898 059  
Production of polyurethanes. Union Carbide Corporation. 898 060  
Process for the production of diisocyanates. Bayer. 898 406  
Dihydrocodeine camphosphonate and pharmaceutical compositions containing it. Orsmond SA. 898 070  
Polythene compositions. Imperial Chemical Industries Ltd. 898 104  
Aza-yohimbane compounds. Laboratoire Francais de Chimiotherapie. 897 988  
Process for the manufacture of alumina for metallurgical purposes. Farbenfabrik Wolfen Veb. 898 097  
Vinylloxyaryl mono sulphonic acids and salts thereof and their polymers. Rhone-Poulenc. 898 407  
3-Amino-S-triazolo[4,3-C] pyrimides and process for their manufacture. Imperial Chemical Industries Ltd. 898 408  
Acrylic acid derivatives. Imperial Chemical Industries Ltd. 898 098  
Process for the manufacture of 2-amino-S-triazolo[2,3-C]pyrimidines. Imperial Chemical Industries Ltd. 898 409  
Stabilisation of trichloroethylene. Imperial Chemical Industries Ltd. 898 200  
Steroids and the manufacture thereof. Upjohn Co. 898 291, 898 292, 898 293  
Modification of fluorocarbon polymers. Du Pont de Nemours & Co., E. I. 898 410  
S-triazolo[2,3-C]pyrimidines. Imperial Chemical Industries. 898 414  
Phosphoric acid alkyl alkyl ester monoamides and process for the production thereof. Badische Anilin- & Soda-Fabrik AG. 898 415  
Substituted benzamides. Lepetit SpA 897 989  
Peroxyorganosiloxanes. Dow Corning Corporation. 897 973  
Process for the preparation of basic substituted carbinols. Thomae GmbH, Karl. 898 010  
Derivatives of thionothiol phosphoric acid. Farbenfabriken Bayer AG. 898 313  
Process for the manufacture and isolation of acrylic acid N-butyl ester. Knapsack-Griesham AG. 897 943  
Thiophosphoric acid esters. Farbenfabriken Bayer AG. 898 418  
Hydrazine carboxylic acid halides and process for preparing same. Ciba Ltd. 898 419  
Sulphonyl substituted phenoxazines. Smith Kline & French Laboratories 898 073  
Vinylpyridine polymers. Montecatini. 898 312  
Stabilisation of halogenated hydrocarbon polymers. Du Pont de Nemours & Co., E. I. 898 182  
Amino compounds. Thomae GmbH, Karl. 898 068  
Production of 5,6-dimethylene-1,2,3,4,7,7-hexachlorobicyclo-[2,2,1]-heptene-(2). Badische Anilin- & Soda-Fabrik AG. 898 378  
Stabilisation of polypropylene glycols. Union Carbide Corporation. 898 379

Process for the production of polymerisation products. Deutsche Gold-und Silber-Scheideanstalt. 898 314  
Phthalocyanine dyes. Badische Anilin- & Soda-Fabrik AG. 898 318  
Purification of caprolactam. Commercial Solvents Corporation. 898 388  
Polyesters and shaped articles produced therefrom. Du Pont de Nemours & Co., E. I. 898 289  
Process for vulcanising saturated olefin copolymers. Montecatini. 898 264  
Method for the preparation of benzothiadiazine natriuretic agents. Simes SpA. 898 109  
Thermosettable polyester resin compositions and their curing. Allied Chemical Corporation. 898 111  
Chemical stabilisation of synthetic rubber. United States Rubber Co. 898 319  
Separation of carbon dioxide from a mixture with ethylene. Union Carbide Corporation. 898 321  
Thiophosphonic acid esters. Farbenfabriken Bayer AG. 898 277  
Indenes substituted by heterocycles and process for their manufacture. Ciba Ltd. 898 322  
Production of impact-resistant polystyrenes. Chemische Werke Huls AG. 898 279  
Polymerisation process. American Cyanamid Co. 898 324  
Vinyl-pyridine copolymer rubber compositions. United States Rubber Co. 898 239  
Production of triethyl borate. United States Borax & Chemical Corporation. 898 325  
Preparation of solvent-resistant polymers. Grace & Co., W. R. 898 241  
Asymmetrically substituted disulphonamides. Boehringer & Soehne GmbH, C. F. 898 243  
Resinous compositions. Union Carbide Corporation. 898 000  
Process for the froth flotation of sulphide ores. Bayer. 898 213  
Synthetic rubber latex. United States Rubber Co. 898 247  
Resinous compositions comprising polyoxymethylene or a derivative thereof. Teikoku Jinzo Kenshi Kabushiki Kaisha. 898 120  
Steroids and the manufacture thereof. Upjohn Co. [Divided out of 898 293.] 898 294, 898 295  
Application of 51-nucleotides. Yamasa Shoyu Kabushiki Kaisha. [Divided out of 898 334.] 898 335

## DIARY DATES

### MONDAY 7 MAY

C.S.—Cambridge: Univ. Chem. Lab., Lensfield Rd., 5 p.m. 'Optical rotary dispersion as a clue in structural organic chemistry' by Prof. W. Klyne.  
S.C.I.—London: 14, Belgrave Sq., S.W.1, 6.30 p.m. 'The French chemical industry' by Prof. L. Jacques.

### TUESDAY 8 MAY

C.S.—Edinburgh: Dept. of Chem., Univ., 4.30 p.m. 'Neutron activation analysis' by Prof. H. Irving.  
Plas. Inst.—London: Wellcome Bld., Euston Rd., 6.15 p.m. A.g.m. and 'High impact materials' by J. S. Skinner.  
Plas. Inst.—London: Wellcome Bld., Euston Rd., N.W.1, 6.30 p.m. A.g.m. and 'Plastics in building schemes for the Royal Dutch Shell group' by W. F. Ratcliffe.  
S.C.I.—London: 14, Belgrave Sq., S.W.1, 6 p.m. 'The production of acetylene from methane' by Dr. B. J. A. Bard.

### WEDNESDAY 9 MAY

R.S.A.—London: John Adam St., Adelphi, W.C.2, 6 p.m. 'The cosmetics industry' by T. Lydson Gardner.  
S. Instr. Tech.—London: Manson House, 26, Portland Pl., W.1, 6 p.m. A.g.m. 7 p.m. 'Computer control of processes' by A. J. Young and I. Gray.

### THURSDAY 10 MAY

C.S.—London: Chem. Theatre, Imperial Col. Sc. and Tech., S.W.7, 7.30 p.m. 'Stereoselectivity in the reactions of cyclic compounds' by Prof. H. B. Henbest.  
C.S. & Hatfield Col. of Tech.—Hatfield: Col. of Tech., 2 day Symposium 'Nitrogen Heterocyclic chemistry'.

### FRIDAY 11 MAY

C.S.—Birmingham: Chem. Dept., Univ., 4.30 p.m. 'Developments in magnetic resonance' by Dr. R. E. Richards.  
S.A.C.—Luton: Col. of Tech., 6.30 p.m. 'The status of trace metal determination' by B. Bagshawe, W. T. Ellwell and H. H. Le Riche.

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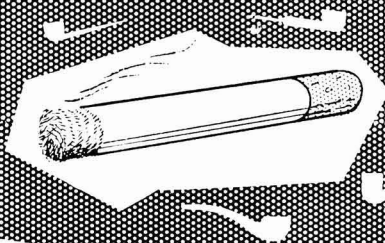
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